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Wrong Diagnosis does not Amount to Medical Negligence: Supreme Court

"We have sympathy for the appellant, but sympathy cannot translate into a legal remedy."

"We appreciate the pain of the appellant, but then, that by itself cannot be a cause for awarding damages for the passing away of his wife. We have sympathy for the appellant, but sympathy cannot translate into a legal remedy."

The Supreme Court dismissed an appeal filed by a man against order of the National Consumer Disputes Redressal Commission (NCDRC) which dismissed his complaint alleging medical negligence on the part of a hospital in the death of his wife in the matter of ***Vinod Jain vs. Santokba Durlabhji Memorial Hospital & Anr*** (Civil Appeal No. 2024 of 2019 Arising out of SLP(C) No. 32721/2017, dated February 25, 2019).

The bench comprising of Justice **L. Nageswara Rao and Justice Sanjay Kishan Kaul** upheld the NCDRC order which had held that the case "would at best be a case of wrong diagnosis, but not medical negligence."

The state commission had allowed his complaint and ordered a compensation of Rs. 15 lakh; the national commission had set it aside.

The Apex Court discussed all the legal principles Bolam Test, Kusum Sharma & Ors. v. Batra Hospital & Medical Research Centre and Jacob Mathew v. State of Punjab while deciding the case.

COMPLAINT

In the early hours on 16.10.2011, the IV cannula stopped functioning and instead of re-cannulating the patient, oral and not IV administration of the antibiotic cefpodoxime was done, which amounts to medical negligence.

NCDRC

The bench agreed with NCDRC approach and said:

"The explanation offered by respondent No. 2-Doctor was that when he attended the patient at 11:00 a.m. on 16.10.2011, he found that the drip had been disconnected, on account of all peripheral veins being blocked due to past chemotherapies, and that the drip had been stopped, the night before itself, at the instance of the appellant. Taking into consideration the fact that the patient was normal, afebrile, well-hydrated and displayed normal vitals, the oral administration of the tablet was prescribed. This, according to the NCDRC was the professional and medical assessment by respondent No. 2-Doctor, arrived at on the basis of a medical condition of the patient, and could not constitute medical negligence."

"We see no reason to differ from the view expressed by the NCDRC, keeping in mind the test enunciated aforesaid Respondent No. 2-Doctor, who was expected to bring a reasonable degree of skill, knowledge and care, based on his assessment of the patient, prescribed oral administration of the antibiotic in that scenario, especially on account of the past medical treatments of the wife of the appellant, because of which the veins for administration of IV could not be located. Her physical condition was found to be one where the oral administration of the drug was possible."

"The appellant has also sought to make out a case that the blood culture report required his wife to be kept in the hospital. This was again a judgment best arrived at

by respondent No. 2-Doctor, based on her other stable conditions, with only the WBC count being higher, which, as per the views of the respondent No. 2-Doctor, could be treated by administration of the antibiotic drug orally, which was prescribed for 5 days, and as per the appellant, was so administered. In the perception of the doctor, the increase in lymphocytes in the blood count was the result of the patient displaying an improved immune response to the infection. **It is in this context that the NCDRC opined that at best, it could be categorized as a possible case of wrong diagnosis.**"

APEX COURT RULING

The apex court ruled that "In our opinion the approach adopted by the NCDRC cannot be said to be faulty, while dealing with the role of the State Commission, which granted damages on a premise that Respondent No. 2-Doctor could have pursued an alternative mode of treatment. **Such a course of action, as a super-appellate medical authority, could not have been performed by the State Commission.** There was no evidence to show any unexplained deviation from standard protocol. It is also relevant to note that the deceased was medically compromised by the reason of her past illnesses……." (*Source: Live law*)

SOME QUOTES FROM THE JUDGMENT

In para 89 of the judgment in ***Kusum Sharma & Ors,*** the test had been laid down as under:

"89. On scrutiny of the leading cases of medical negligence both in our country and other countries specially the United Kingdom, some basic principles emerge in dealing with the cases of medical negligence. While deciding whether the medical professional is guilty of medical negligence following well-known principles must be kept in view:

- Negligence is the breach of a duty exercised by omission to do something which a reasonable man, guided by those considerations which ordinarily regulate the conduct of human affairs, would do, or doing something which a prudent and reasonable man would not do.
- Negligence is an essential ingredient of the offence. The negligence to be established by the prosecution must be culpable or gross and not the negligence merely based upon an error of judgment.
- The medical professional is expected to bring a reasonable degree of skill and knowledge and must exercise 4 (1968) 118 New LJ 469 5 (supra) a reasonable degree of care. Neither the very highest nor a very low-degree of care and competence judged in the light of the particular circumstances of each case is what the law requires.
- A medical practitioner would be liable only where his conduct fell below that of the standard so far reasonably competent practitioner in his field.
- In the realm of diagnosis and treatment there is scope for genuine difference of opinion and one professional doctor is clearly not negligent merely because his conclusion differs from that of other professional doctor.
- The medical professional is often called upon to adopt a procedure which involves higher element of risk, but which he honestly believes as providing greater chances of success for the patient rather than a procedure involving lesser risk but higher chances of failure. Just because a professional looking to the gravity of illness has taken higher element of risk to redeem the patient out of his/her suffering which did not yield the desired result may not amount to negligence.
- Negligence cannot be attributed to a doctor so long as he performs his duties with reasonable skill and competence. Merely because the doctor chooses one course of action in preference to the other one available, he would not be liable if the course of action chosen by him was acceptable to the medical profession.
- It would not be conducive to the efficiency of the medical profession if no doctor could administer medicine without a halter round his neck.
- It is our bounden duty and obligation of the civil society to ensure that the medical professionals are not unnecessarily harassed or humiliated so that they can perform their professional duties without fear and apprehension.
- The medical practitioners at times also have to be saved from such a class of complainants who use criminal process as a tool for pressurizing the medical professionals/hospitals particularly private hospitals or clinics for extracting uncalled for compensation. Such malicious proceedings deserve to be discarded against the medical practitioners.
- The medical professionals are entitled to get protection so long as they perform their duties with reasonable skill and competence and in the interest of the patients. The interest and welfare of the patients have to be paramount for the medical professionals."

AMERICAN FAMILY PHYSICIAN

Uterine Fibroids: Diagnosis and Treatment

MARIA SYL D. DE LA CRUZ, EDWARD M. BUCHANAN

ABSTRACT

Uterine fibroids are common benign neoplasms, with a higher prevalence in older women and in those of African descent. Many are discovered incidentally on clinical examination or imaging in asymptomatic women. Fibroids can cause abnormal uterine bleeding, pelvic pressure, bowel dysfunction, urinary frequency and urgency, urinary retention, low back pain, constipation, and dyspareunia. Ultrasonography is the preferred initial imaging modality. Expectant management is recommended for asymptomatic patients because most fibroids decrease in size during menopause. Management should be tailored to the size and location of fibroids; the patient's age, symptoms, desire to maintain fertility, and access to treatment; and the experience of the physician. Medical therapy to reduce heavy menstrual bleeding includes hormonal contraceptives, tranexamic acid, and nonsteroidal anti-inflammatory drugs. Gonadotropin-releasing hormone agonists or selective progesterone receptor modulators are an option for patients who need symptom relief preoperatively or who are approaching menopause. Surgical treatment includes hysterectomy, myomectomy, uterine artery embolization, and magnetic resonance–guided focused ultrasound surgery.

Keywords: Uterine fibroids, ultrasonography, hysteroscopy, hormonal contraceptives, hysterectomy, myomectomy, uterine artery embolization

Uterine fibroids, or leiomyomas, are the most common benign tumors in women of reproductive age.[1] Their prevalence is age dependent; they can be detected in up to 80% of women by 50 years of age.[2] Fibroids are the leading indication for hysterectomy, accounting for 39% of all hysterectomies performed annually in the United States.[3] Although many are detected incidentally on imaging in asymptomatic women, 20% to 50% of women are symptomatic and may wish to pursue treatment.[4]

EPIDEMIOLOGY AND ETIOLOGY

Fibroids are benign tumors that originate from the uterine smooth muscle tissue (myometrium) whose growth is dependent on estrogen and progesterone.[5,6] Fibroids are rare before puberty, increase in prevalence during the reproductive years, and decrease in size after menopause.[6] Aromatase in fibroid tissue allows for endogenous production of estradiol, and fibroid stem cells express estrogen and progesterone receptors that facilitate tumor growth in the presence of these hormones.[5] Protective factors and risk factors for fibroid development are listed in Table 1.[7-9] The major risk factors for fibroid development are increasing age (until menopause) and African descent.[7,8] Compared with white women, black women have a higher lifetime prevalence of fibroids and more severe symptoms, which can affect their quality of life.[10]

CLINICAL FEATURES

Uterine fibroids are classified based on location: subserosal (projecting outside the uterus), intramural (within the myometrium), and submucosal (projecting into the uterine cavity). The symptoms and treatment options are affected by the size, number, and location of

Table 1. Factors that Affect the Risk of Uterine Fibroids

Decreased risk	Increased risk
Increased parity[7]	African descent[8]
Late menarche (older than 16 years)[8]	Age greater than 40 years[8]
Smoking[8]	Early menarche (younger than 10 years)[8]
Use of oral contraceptives[9]	Family history of uterine fibroids[8]
	Nulliparity[7]
	Obesity[7]

Information from references 7 through 9.

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Source: Adapted from Am Fam Physician. 2017;95(2):100-107.

the tumors.[11] The most common symptom is abnormal uterine bleeding, usually excessive menstrual bleeding.[12] Other symptoms include pelvic pressure, bowel dysfunction, urinary frequency and urgency, urinary retention, low back pain, constipation, and dyspareunia.[13]

Uterine fibroids may be associated with infertility, and some experts recommend that women with infertility be evaluated for fibroids, with potential removal if the tumors have a submucosal component.[14] However, there is no evidence from randomized controlled trials to support myomectomy to improve fertility.[15] One meta-analysis included two studies that showed improvement in spontaneous conception rates in women who underwent myomectomy for submucosal fibroids (relative risk [RR] = 2.034; 95% confidence interval [CI], 1.081 to 3.826; P = .028).[16] However, no statistically significant difference was noted in the ongoing pregnancy/live birth rate. Women with intramural fibroids had no differences in pregnancy rates after undergoing myomectomy. Although studies have had conflicting results on the change in fibroid size during pregnancy,[17,18] a large retrospective study of women with uterine fibroids found a significantly increased risk of cesarean delivery compared with a control group (33.1% vs. 24.2%), as well as increases in the risk of breech presentation (5.3% vs. 3.1%), preterm premature rupture of membranes (3.3% vs. 2.4%), delivery before 37 weeks' gestation (15.1% vs. 10.5%), and intrauterine fetal death with growth restriction (3.9% vs. 1.5%).[19] Therefore, fibroids in pregnant women warrant additional maternal and fetal surveillance.

In the postpartum period, women with fibroids have an increased risk of postpartum hemorrhage secondary to an increased risk of uterine atony.[20] The risk of malignancy for uterine fibroids is very low; the prevalence of leiomyosarcoma is estimated at about one in 400 (0.25%) women undergoing surgery for fibroids.[21] Because the natural course of fibroids involves growth and regression, enlarging fibroids are not an indication for removal.[22,23]

DIAGNOSIS

The evaluation of fibroids is based mainly on the patient's presenting symptoms: abnormal menstrual bleeding, bulk symptoms, pelvic pain, or findings suggestive of anemia. Fibroids are sometimes found in asymptomatic women during routine pelvic examination or incidentally during imaging.[24] In the United States, ultrasonography is the preferred initial imaging modality for fibroids.[4] Transvaginal ultrasonography is about 90% to 99% sensitive for detecting uterine fibroids, but it may miss subserosal or small fibroids.[25,26] Adding sonohysterography or hysteroscopy improves sensitivity for detecting submucosal myomas.[25] There are no reliable means to differentiate benign from malignant tumors without pathologic evaluation. Some predictors of malignancy on magnetic resonance imaging include age older than 45 years (odds ratio [OR] = 20), intratumoral hemorrhage (OR = 21), endometrial thickening (OR = 11), T2-weighted signal heterogeneity (OR = 10), menopausal status (OR = 9.7), and nonmyometrial origin (OR = 4.9).[27,28] Risk factors for leiomyosarcoma include radiation of the pelvis, increasing age, and use of tamoxifen,[29,30] which has implications for surgical management of fibroids. Table 2 includes the differential diagnosis of uterine masses.[31]

MANAGEMENT

Treatment of uterine fibroids should be tailored to the size and location of the tumors; the patient's age, symptoms, desire to maintain fertility, and access to treatment; and the physician's experience[4,11] (Table 3[32-42] and Table 4[4,16,34,38,40-44]). The ideal treatment satisfies four goals: relief of signs and symptoms, sustained reduction of the size of fibroids, maintenance of fertility (if desired), and avoidance of harm. Figure 1 presents an algorithm for the management of uterine fibroids.[4]

Expectant Therapy

About 3% to 7% of untreated fibroids in premenopausal women regress over six months to three years, and most decrease in size at menopause. Because there is minimal concern for malignancy in women with asymptomatic fibroids, watchful waiting is preferred for management.[4] There are no studies that support surveillance with imaging or repeat imaging in asymptomatic women with fibroids.[4,11]

Table 2. Differential Diagnosis of Uterine Masses

Adenomyosis	Uterine carcinosarcoma (considered an epithelial neoplasm)
Ectopic pregnancy	Uterine fibroids
Endometrial carcinoma	Uterine sarcoma (leiomyosarcoma, endometrial stromal sarcoma, mixed mesodermal tumor)
Endometrial polyp	
Endometriosis	
Metastatic disease	
Pregnancy	

Information from reference 31.

Medical Therapy

Hormonal contraceptives

women who use combined oral contraceptives have significantly less self-reported menstrual blood loss after 12 months compared with placebo.[33] However, the levonorgestrel-releasing intrauterine system results in a significantly greater reduction in menstrual blood loss at 12 months vs. oral contraceptives (mean reduction = 91% vs. 13% per cycle; P < .001).[33] In six

Table 3. Comparison of Recommended Therapies for Uterine Fibroids

Treatment	Description	Advantages	Disadvantages	Fertility preserved?
Medical therapies				
Gonadotropin-releasing hormone agonists[32]	Preoperative treatment to decrease size of tumors before surgery or in women approaching menopause	Decrease blood loss, operative time, and recovery time	Long-term treatment associated with higher cost, menopausal symptoms, and bone loss; increased recurrence risk with myomectomy	Depends on subsequent procedure
Levonorgestrel-releasing intrauterine system[33]	Treats abnormal uterine bleeding, likely by stabilization of endometrium	Most effective medical treatment for reducing blood loss; decreases fibroid volume	Irregular uterine bleeding, increased risk of device expulsion	Yes, if discontinued after resolution of symptoms
Nonsteroidal anti-inflammatory drugs[34]	Anti-inflammatories and prostaglandin inhibitors	Reduce pain and blood loss from fibroids	Do not decrease fibroid volume; gastrointestinal adverse effects	Yes
Oral contraceptives[33]	Treat abnormal uterine bleeding, likely by stabilization of endometrium	Reduce blood loss from fibroids; ease of conversion to alternate therapy if not successful	Do not decrease fibroid volume	Yes, if discontinued after resolution of symptoms
Selective progesterone receptor modulators[35,36]	Preoperative treatment to decrease size of tumors before surgery or in women approaching menopause	Decrease blood loss, operative time, and recovery time; not associated with hypoestrogenic adverse effects	Headache and breast tenderness, progesterone receptor modulator–associated endometrial changes; increased recurrence risk with myomectomy	Depends on subsequent procedure
Tranexamic acid[37,38]	Antifibrinolytic therapy	Reduces blood loss from fibroids; ease of conversion to alternate therapy	Does not decrease fibroid volume; medical contraindications	Yes
Surgical therapies				
Hysterectomy[39]	Surgical removal of the uterus (transabdominally, transvaginally, or laparoscopically)	Definitive treatment for women who do not wish to preserve fertility; transvaginal and laparoscopic approach associated with decreased pain, blood loss, and recovery time compared with transabdominal surgery	Surgical risks higher with transabdominal surgery (e.g., infection, pain, fever, increased blood loss and recovery time); morcellation with laparoscopic approach increases risk of iatrogenic dissemination of tissue	No
Magnetic resonance-guided focused ultrasound surgery[40]	In situ destruction by high-intensity ultrasound waves	Noninvasive approach; shorter recovery time with modest symptom improvement	Heavy menses, pain from sciatic nerve irritation, higher reintervention rate	Unknown
Myomectomy[41]	Surgical or endoscopic excision of tumors	Resolution of symptoms with preservation of fertility	Recurrence rate of 15% to 30% at five years, depending on size and extent of tumors	Yes
Uterine artery embolization[42]	Interventional radiologic procedure to occlude uterine arteries	Minimally invasive; avoids surgery; short hospitalization	Recurrence rate > 17% at 30 months; postembolization syndrome	Unknown

Information from references 32 through 42.

Table 4. Summary of Recommended Treatment Options for Uterine Fibroids

Patient characteristics	Treatment options
Asymptomatic women	Clinical surveillance[4]
Infertile women with distorted uterine cavity (i.e., submucosal fibroids) who desire future fertility	Myomectomy[16]
Symptomatic women who desire future fertility	Medical treatment or myomectomy[34,38,41]
Symptomatic women who do not desire future fertility but wish to preserve the uterus	Medical treatment, myomectomy, uterine artery embolization, magnetic resonance–guided focused ultrasound surgery[34,38,40-42]
Symptomatic women who want definitive treatment and do not desire future fertility	Hysterectomy by least invasive approach possible[43,44]

Information from references 4, 16, 34, 38, and 40 through 44.

prospective observational studies, reported expulsion rates of intrauterine devices were between zero and 20% in women with uterine fibroids.[45] There is a lack of high-quality evidence regarding oral and injectable progestin for uterine fibroids.[46-48]

Tranexamic acid

Tranexamic acid is an oral nonhormonal antifibrinolytic agent that significantly reduces menstrual blood loss compared with placebo (mean reduction = 94 mL per cycle; 95% CI, 36 to 151 mL).[37,38] One small nonrandomized study reported a higher rate of fibroid necrosis in patients who received tranexamic acid compared with untreated patients (15% vs. 4.7%; OR = 3.60; 95% CI, 1.83 to 6.07; P = .0003), with intralesional thrombi in one-half of the 22 cases involving fibroid necrosis (manifesting as apoptotic cellular debris with inflammatory cells, and usually hemorrhage).[49] However, in a systematic review of four studies with 200 patients who received tranexamic acid, none of the studies detailed the adverse effects of fibroid necrosis or thrombus formation.[50]

Nonsteroidal anti-inflammatory drugs

Another medical option for the treatment of uterine fibroids is a nonsteroidal anti-inflammatory drug. These agents significantly reduce blood loss (mean reduction = 124 mL per cycle; 95% CI, 62 to 186 mL) and improve pain relief compared with placebo,[34] but are less effective in decreasing blood loss compared with the levonorgestrel-releasing intrauterine system or tranexamic acid at three months.[51]

Hormone therapy

Gonadotropin-releasing hormone (GnRH) agonists and selective progesterone receptor modulators (SPRMs) are options for patients who need temporary relief from symptoms preoperatively or who are approaching menopause. Preoperative administration of GnRH agonists (e.g., leuprolide, goserelin, triptorelin) increases hemoglobin levels preoperatively by 1.0 g per dL (10 g per L) and postoperatively by 0.8 g per dL (8 g per L), as well as significantly decreases pelvic symptom scores.[32] Adverse effects resulting from the hypoestrogenized state, including hot flashes (OR = 6.5), vaginitis (OR = 4.0), sweating (OR = 8.3), and change in breast size (OR = 7.7), affect the long-term use of these agents.[32]

Compared with placebo, the SPRM mifepristone significantly decreases heavy menstrual bleeding (OR = 18; 95% CI, 6.7 to 47) and improves fibroid-specific quality of life, but does not affect fibroid volume.[35] Ulipristal is an SPRM approved as a contraceptive in the United States but used in other countries for the treatment of fibroids in adult women who are eligible for surgery. Compared with placebo, a 5-mg dose of ulipristal significantly reduces mean blood loss (94% vs. 48% per cycle; 95% CI, 55% to 83%; P < .001), decreases fibroid volume by more than 25% (85% vs. 45%; 95% CI, 4% to 39%; P = .01), and induces amenorrhea in significantly more patients (94% vs. 48%; 95% CI, 50% to 77%; P < .001).[52] Treatment is limited to three months of continuous use. The most common adverse effects include headache and breast tenderness. The advantage of SPRMs over GnRH agonists for preoperative adjuvant therapy is their lack of hypoestrogenic adverse effects and bone loss. However, SPRMs can result in progesterone receptor modulator–associated endometrial changes, although these seem to be benign.[36]

Other agents

Other, less-studied options for the treatment of uterine fibroids include aromatase inhibitors and estrogen receptor antagonists. Aromatase inhibitors (e.g., letrozole, anastrozole, fadrozole [not available in the United States]) block the synthesis of estrogen. Limited data have shown that they help reduce fibroid size as well as decrease menstrual bleeding, with adverse effects including hot flashes, vaginal dryness, and musculoskeletal pain.[53,54] Overall, there is insufficient evidence to support the use of aromatase inhibitors for the treatment of uterine fibroids.[55] Selective estrogen receptor modulators act as partial estrogen receptor agonists in bone, cardiovascular tissue, and the endometrium. In a small prospective trial of

18 patients, tamoxifen did not reduce fibroid size or uterine volume, but did reduce menstrual blood loss by 40% to 50% and decrease pelvic pain compared with the control group.[56] Based on its adverse effects (e.g., hot flashes, dizziness, endometrial thickening), the authors concluded that its risks outweigh its marginal benefits for fibroid treatment. Another selective estrogen receptor modulator, raloxifene, has also shown inconsistent results, with two of three studies included in a Cochrane review showing significant benefit.[57]

Surgery

Hysterectomy

Hysterectomy provides a definitive cure for women with symptomatic fibroids who do not wish to preserve fertility, resulting in complete resolution of symptoms and improved quality of life. Hysterectomy by the least invasive approach possible is the most effective treatment for symptomatic uterine fibroids.[39] Vaginal hysterectomy is the preferred technique because it provides several statistically significant advantages, including shorter surgery time than total laparoscopic hysterectomy or laparoscopically assisted vaginal hysterectomy (70 minutes vs. 151 minutes vs. 130 minutes, respectively), decreased blood loss (183 mL vs. 204 mL vs. 358 mL), shorter hospitalization (51 hours vs. 77 hours vs. 77 hours), and shorter paralytic ileus time (19 hours vs. 28 hours vs. 26 hours); however, vaginal hysterectomy is limited by the size of the myomatous uterus.[43] Abdominal hysterectomy is an alternative approach, but the balance of risks and benefits must be individualized to each patient.[44]

The laparoscopic extraction of the uterus may be performed with morcellation, whereby a rotating blade cuts the tissue into small pieces. This technique has come under scrutiny because of concerns about iatrogenic dissemination of benign and malignant tissue. The U.S. Food and Drug Administration recommends limiting the use of laparoscopic morcellation to reproductive-aged women who are not candidates for en bloc uterine resection.[58] The American College of Obstetricians and Gynecologists recommends morcellation as an option, but emphasizes the importance of informed consent and notes that the technique should not be performed in women with suspected or known uterine cancer.[59,60] Approximately one in 10 women have new symptoms after hysterectomy with bilateral salpingo-oophorectomy.[61]

Myomectomy

Hysteroscopic myomectomy is the preferred surgical procedure for women with submucosal fibroids who wish to preserve their uterus or fertility. It is optimal for submucosal fibroids less than 3 cm when more than 50% of the tumor is intracavitary.[62] Laparoscopy is associated with less postoperative pain at 48 hours, less risk of postoperative fever (OR = 0.44; 95% CI, 0.26 to 0.77), and shorter hospitalization (mean of 67 fewer hours; 95% CI, 55 to 79 hours) compared with open myomectomy.[41] An estimated 15% to 33% of fibroids recur after myomectomy, and approximately 10% of women who undergo this procedure will have a hysterectomy within five to 10 years.[24]

Uterine artery embolization

Uterine artery embolization is an option for women who wish to preserve their uterus or avoid surgery because of medical comorbidities or personal preference.[4] It is an interventional radiologic procedure in which occluding agents are injected into one or both of the uterine arteries, limiting blood supply to the uterus and fibroids. Compared with hysterectomy and myomectomy, uterine artery embolization has a significantly decreased length of hospitalization (mean of three fewer days), decreased time to normal activities (mean of 14 days), and a decreased likelihood of blood transfusion (OR = 0.07; 95% CI, 0.01 to 0.52).[42] Long-term studies show a reoperation rate of 20% to 33% within 18 months to five years.[24] Contraindications include pregnancy, active uterine or adnexal infections, allergy to intravenous contrast media, and renal insufficiency. The most common complication is postembolization syndrome, which is characterized by mild fever and pain, and vaginal expulsion of fibroids.[63]

There is insufficient evidence on the effect of uterine artery embolization on future fertility. An observational study of 26 women treated with uterine artery embolization and 40 treated with hysterectomy found no difference in live birth rates.[42] In a retrospective study with five years of follow-up in women who received uterine artery embolization for fibroids, 27 (4.2%) had one (n = 20) or more (n = 7) pregnancies after uterine artery embolization.[64] Of these pregnancies, there were 15 miscarriages and 19 live births, 79% of which were cesarean deliveries because of complications. Further studies are needed on fertility outcomes after uterine artery embolization so that patients can be counseled appropriately.

Myolysis

Myolysis is a minimally invasive procedure targeting the destruction of fibroids via a focused energy delivery system such as heat, laser, or more recently, magnetic resonance–guided focused ultrasound surgery (MRgFUS). A study of 359 women treated with MRgFUS showed improved scores on the Uterine Fibroid Symptoms Quality of Life questionnaire at three months that persisted for up to 24 months ($P < .001$).[40] In another study comparing women who underwent MRgFUS with those who underwent total abdominal hysterectomy, the groups had similar improvement in quality-of-life scores at six months, but the MRgFUS group had significantly fewer complications (14 vs. 33 events; $P < .0001$).[65] In a five-year follow-up study of 162 women, the reoperative rate was 59%.[66] Overall, this less-invasive procedure is well tolerated, although risks include localized pain and heavy bleeding.[40] Spontaneous conception has occurred in patients after MRgFUS, but further studies are needed to examine its effect on future fertility.[67]

Note: For complete article visit: www.aafp.org/afp.

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Practice Guidelines

CDC UPDATED RECOMMENDATIONS FOR CONTRACEPTIVE USE

Almost one-half of pregnancies are unintentional, with one-half of these in women not using a contraceptive method when conception occurred. Adolescents and young women, those who are racial or ethnic minorities, and those with lower levels of education and income are more likely to become pregnant unintentionally. Guiding women and their partners in selecting an appropriate contraceptive method and ensuring its correct and consistent use can help with prevention.

The Centers for Disease Control and Prevention (CDC) first published the *U.S. Selected Practice Recommendations for Contraceptive Use* (U.S. SPR) in 2013 to provide direction for safe and effective use of contraceptive methods. These guidelines update the 2013 report.

Using the Guidelines

The guidelines are arranged by contraceptive method and discussed in order from highest to lowest effectiveness. It should be noted that recommendations do not comment on every aspect of use, but instead provide the best evidence available for issues that commonly occur. In general, initiation, follow-up, and management of problems are discussed for each method, with the recommendations listed first, followed by comments and evidence summaries.

The *U.S. Medical Eligibility Criteria for Contraceptive Use*, which can be found at http://www.cdc.gov/reproductivehealth/contraception/usmec.htm, contains recommendations for women who require additional contraceptive guidance for medical reasons. Charts and algorithms that summarize the recommendations can be found in the appendix of the original CDC guidelines. The U.S. SPR website provides more helpful tools at http://www.cdc.gov/reproductivehealth/contraception/usspr.htm.

Updates

The 2016 guidelines updated recommendations about starting or resuming regular contraception after using ulipristal emergency contraceptive pills and added new recommendations regarding medications to help with inserting intrauterine devices (IUDs).

Physicians should counsel women to wait at least five days after taking ulipristal before starting or continuing their hormonal contraception. However, if using a method that is nonhormonal, it can be started or resumed immediately after taking ulipristal. If needed, a regular contraceptive method should be prescribed. If a woman opts for a method that would require an appointment with a physician (e.g., depot medroxyprogesterone, implants, IUDs), starting it at the same time as ulipristal is an option. Although this could make ulipristal less effective, it is a risk that should be balanced with the risk of not initiating regular contraception. Sexual intercourse should be avoided or barrier contraception used in the first week of starting or restarting regular contraception or until menses occurs. If there is no withdrawal bleeding in three weeks, a pregnancy test is recommended.

When performing IUD insertion, routine administration of misoprostol is not recommended, but its use may be beneficial in some women, including those in whom insertion has recently failed. To decrease pain associated with insertion, a paracervical block with lidocaine may be helpful.

Confirming a Woman is not Pregnant

Most of the guidance indicates that a contraceptive method can be started anytime during a woman's menstrual cycle, assuming she is not pregnant. Physicians can be reasonably certain that a woman is not pregnant by using the following criteria, which have a high accuracy. If there are no signs or symptoms of pregnancy and at least one criterion is met, it can be assumed with reasonable certainty that the woman is not pregnant; however, a urine test can still be warranted based on the physician's clinical judgment. If criteria are not met, then pregnancy cannot be ruled out with reasonable certainty. This is true even if there are negative results on a pregnancy test.

Criteria include that she has started her normal menses or had a spontaneous or induced abortion no more than seven days ago; has not participated in sexual intercourse since the start of her last normal menses; is

Source: Adapted from Am Fam Physician. 2017;95(2):125-126.

correctly and consistently using a reliable contraceptive method; is four weeks or less postpartum; or is fully or almost fully breastfeeding, has amenorrhea, and is less than six months postpartum.

Procedures

Recommendations regarding the examinations and tests to perform before starting each contraceptive method in women presumed to be healthy are provided in the guidelines. The CDC has chosen to use a classification system created by the World Health Organization to determine their applicability. Class A indicates that the tests are essential and mandatory in all circumstances. Class B indicates that they contribute substantially to safe and effective contraceptive use, but their application can be considered within the public health context, service context, or both. Risks associated with not performing Class B tests should be weighed against the benefits of making the contraceptive method available. Class C tests do not contribute considerably to safe and effective use.

Class A

Before copper or levonorgestrel-releasing IUD insertion, bimanual examination and cervical inspection should be performed to determine uterine size and position, as well as to identify cervical or uterine abnormalities that could be a sign of infection or that could prevent IUD insertion. No examinations or tests are needed before using an implant, or initiating depot medroxyprogesterone or progestin-only pills. However, before starting combined hormonal contraceptives, blood pressure should be measured. Additionally, measuring baseline weight and body mass index could be useful to monitor women using all of these contraceptive methods.

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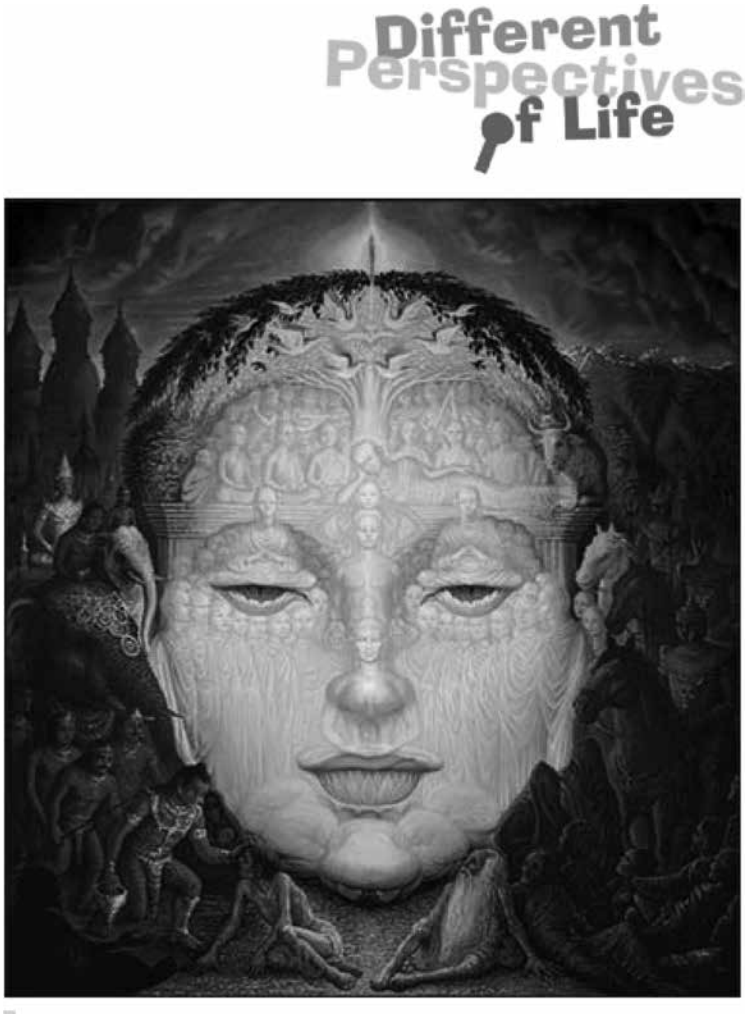

J A different perception used as a memory trick.

Photo Quiz

NECK CREPITUS IN A RUNNER

A 27-year-old man presented with constant right-sided neck, throat, and ear pain that began one day earlier after he completed an uneventful five-mile trail run. There were no alleviating or exacerbating factors for the pain. He did not have trauma or injury to the area. He reported a vague sensation of fluid moving around in his neck and a strange feeling in his throat with swallowing. He did not have dysphagia, odynophagia, fever, chills, or respiratory symptoms. He did not use drugs or alcohol.

On physical examination, he was well appearing with normal vital signs and normal oxygen saturation on room air. An ear examination was normal. The neck examination revealed minimally palpable crepitus at the right lateral aspect of the base of the neck. There was no skin warmth or erythema. Soft tissue neck radiography was performed (Figures 1 and 2).

Question

Based on the patient's history, physical examination, and radiography findings, which one of the following is the most likely diagnosis?

A. Esophageal rupture.

B. Retropharyngeal abscess.

C. Spontaneous gas gangrene.

D. Spontaneous pneumomediastinum.

E. Spontaneous pneumothorax.

Discussion

The answer is D: spontaneous pneumomediastinum. Spontaneous pneumomediastinum is the sudden presence of free air or gas in the mediastinal space in a previously healthy patient. The deep tissue planes in the neck and upper thorax form a potential space for free air to track from the mediastinum to the cervical region (Figure 3), causing subcutaneous emphysema, as in this patient. Pneumomediastinum is rare and is often the result of thoracic trauma, surgical

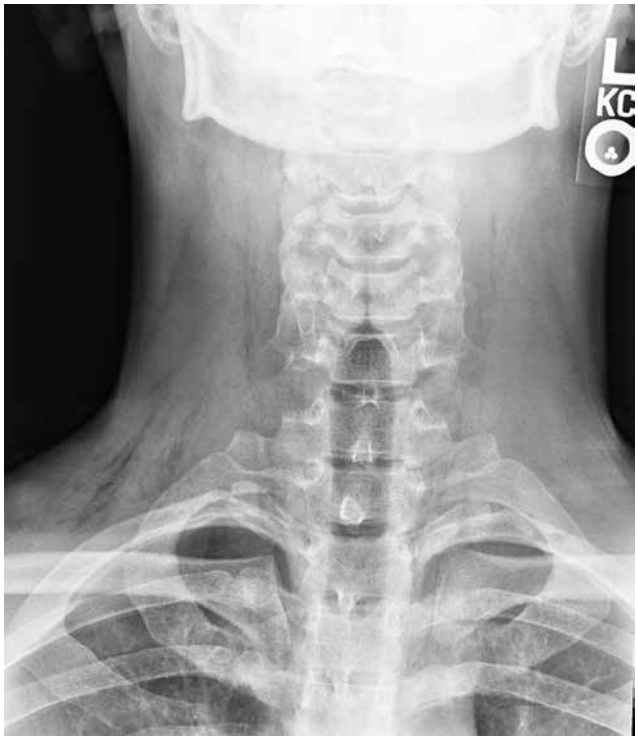

Figure 1.

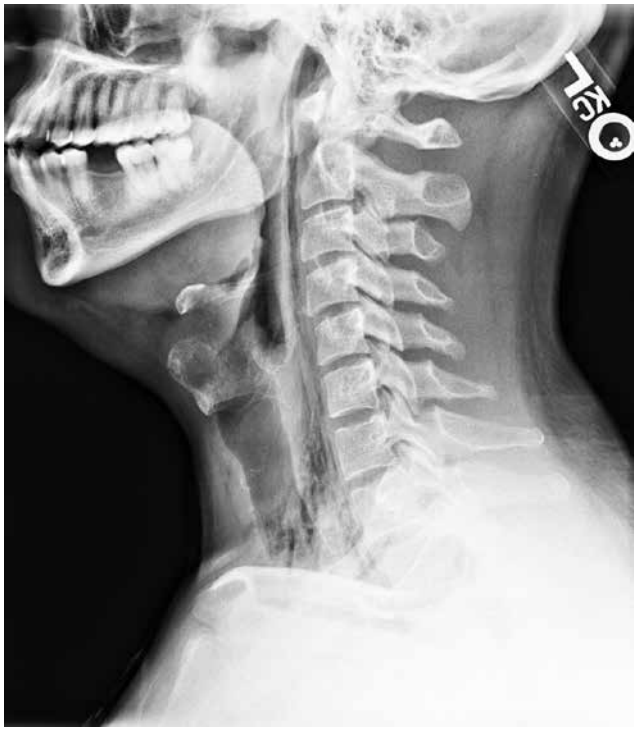

Figure 2.

Source: Adapted from Am Fam Physician. 2017;95(2):113-115.

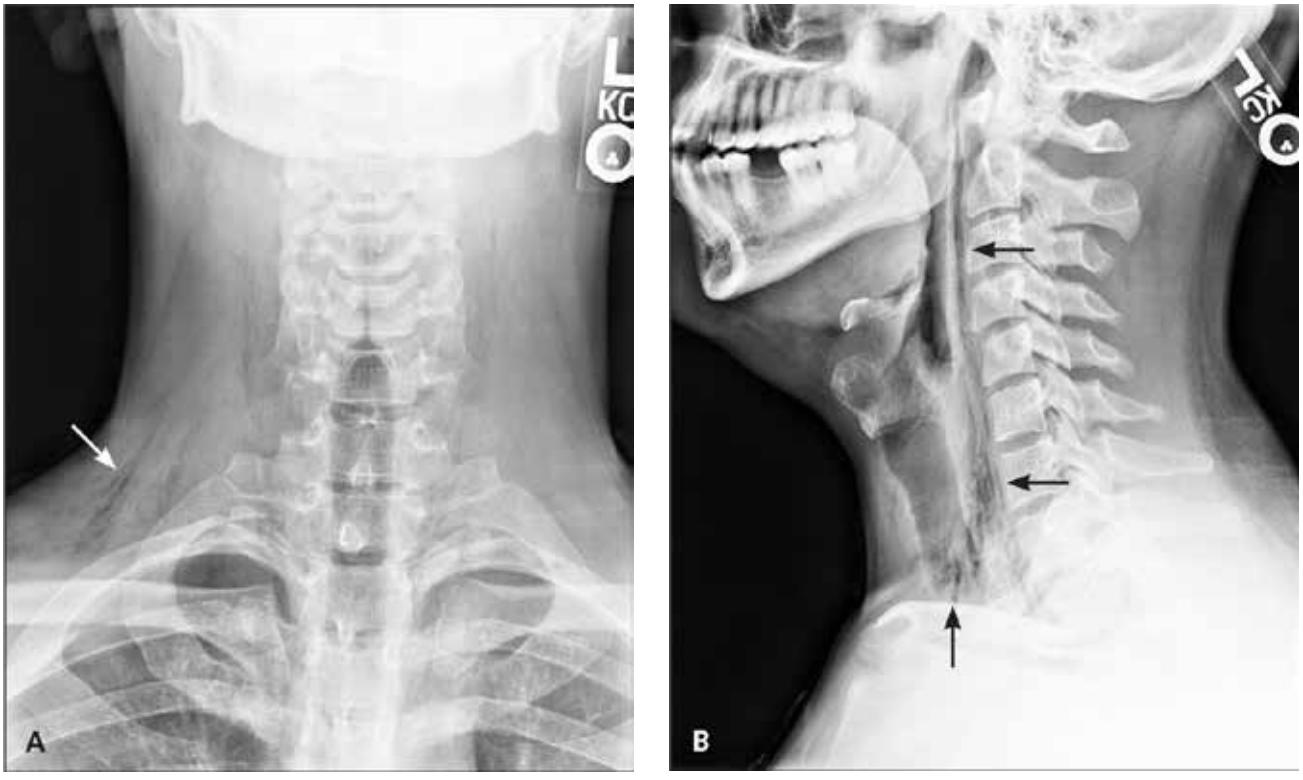

Figure 3. Free air or gas (*arrows*) in the deep tissue planes of the neck and upper thorax tracking superiorly from the mediastinal space. **(A)** Anteroposterior view. **(B)** Lateral view.

procedures, or pulmonary infections.[1] Spontaneous pneumomediastinum is more common in children than adults. In adults, it predominantly occurs in healthy, thin young men. The underlying cause is alveolar rupture due to overdistention or increased alveolar pressure.[2] There are case reports of spontaneous pneumomediastinum resulting from exertion in childbirth and during sports.[3]

Symptoms include the sudden onset of neck swelling, neck pain, odynophagia, chest pain, dyspnea, cough, and, less commonly, voice changes. On physical examination, subcutaneous crepitus in the neck may be noted. The diagnosis can usually be made with plain radiography of chest or neck soft tissue. Radiographs reveal subcutaneous emphysema or air in the tissue planes of the neck. Less commonly, axial computed tomography of the chest is needed to make the diagnosis. No treatment beyond rest and analgesics is recommended. Clinical findings typically resolve within seven days.

Esophageal rupture is a spontaneous tear of the esophageal wall due to increased pressure in the esophagus. Most cases are iatrogenic, usually from medical instrumentation such as endoscopy, but it can also occur with vomiting. Symptoms are severe retrosternal chest pain, dysphagia, and upper abdominal pain that is typically preceded by vomiting. Esophageal rupture can cause mediastinitis and pneumomediastinum. Gas in the neck may be seen. Diagnosis is made with a contrast esophagram or computed tomography.[4]

Retropharyngeal abscess is caused by a bacterial infection in the soft tissue posterior to the pharynx. It is more common in children. Symptoms include dysphagia, odynophagia, drooling, decreased oral intake, neck swelling, refusal to move the neck, muffled "hot potato" voice, and fever. Typically, children with the condition are ill appearing. Radiography of the lateral neck may reveal widening of the prevertebral space, loss of cervical lordosis because of muscle spasm, a soft tissue mass in the posterior pharynx, or rarely, air fluid levels or gas in the prevertebral space only.[5]

Spontaneous gas gangrene, or clostridial myonecrosis, is a life-threatening muscle infection that develops after hematogenous seeding by *Clostridium septicum* from the gastrointestinal tract. It can occur anywhere in the skeletal muscles of the body. Symptoms include sudden onset of severe muscle pain and fever. Predisposing factors may include gastrointestinal lesions, such as carcinoma, and immunosuppression. Physical findings include tissue crepitus with tenderness,

Summary Table

Condition	Characteristics
Esophageal rupture	Severe retrosternal chest pain, dysphagia, and upper abdominal pain that is typically preceded by vomiting; gas in the neck may be seen if complicated by mediastinitis or pneumomediastinum
Retropharyngeal abscess	Dysphagia, odynophagia, drooling, decreased oral intake, neck swelling, refusal to move the neck, muffled "hot potato" voice, and fever; more common in children; radiography of the lateral neck may reveal widening of the prevertebral space, loss of cervical lordosis, a soft tissue mass in the posterior pharynx, or, rarely, air fluid levels or gas in the prevertebral space only
Spontaneous gas gangrene	Sudden onset of severe muscle pain and fever; tissue crepitus and tenderness, edema, bullae, and purple skin discoloration; often accompanied by systemic symptoms of sepsis; gas within the soft tissue on radiography or computed tomography
Spontaneous pneumomediastinum	Sudden onset of neck swelling, neck pain, odynophagia, chest pain, dyspnea, cough, and, less commonly, voice changes; subcutaneous crepitus in the neck may be noted; radiographs reveal subcutaneous emphysema and air in the tissue planes of the neck
Spontaneous pneumothorax	Sudden onset of chest pain and shortness of breath; hyperresonance and decreased breath sounds on the affected side; chest radiographs show displacement of the pleural line

edema, bullae, and purple skin discoloration. Sepsis is common. Gas within the soft tissue on radiography or computed tomography is suggestive of gas gangrene and helps to differentiate it from other bacterial soft tissue infections.[6]

Spontaneous pneumothorax is the presence of gas or free air in the pleural space of the thoracic cavity. Symptoms are sudden onset of chest pain and shortness of breath. Physical findings can be subtle and include hyperresonance and decreased breath sounds on the affected side. Chest radiographs (posteroanterior inspiratory and lateral films) may show displacement of the pleural line (the line between the lung and chest wall), but soft tissue radiographs are normal.[7]

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Low Cost Clinic Fitness Tests

Six-minute Walk Test: If you can't walk 6 minutes at a comfortable pace. Your cardio fitness needs attention: You are at risk if you walk less than 350 yards (for men and women).

- Normal >500 m (1700 ft)
- Risk <300 m (1020 ft)
- High risk <200 m (680 ft)
- Mean walk distance males 1,188 ft; females 1,089 ft, symptoms in <25% of patients *(Enright Chest 2003;123: 87-398)*

CONSENSUS STATEMENT

Harm Reduction Conference: Consensus Statement

MAPLE HALL, INDIA HABITAT CENTRE, NEW DELHI | JANUARY 30, 2019

DEFINITION

Harm Reduction, Risk Reduction, Harm Minimization

In harm producing behaviors and clinical situations, the aim should be to achieve a harm free state but if the same is not possible immediately one should try to achieve realistic goals using the principles of harm minimization incorporating reduction of the concern risk or substituting it with available less harmful alternatives.

Harm reduction are realistic (not idealistic) interventions aimed at achievable goals and done to reduce the negative effects of health behaviors without stopping the problematic health behaviors completely. However, elimination should be the primary goal.

ESTABLISHED HARM REDUCTIONS

Vaccination

Vaccination is an established harm reduction strategy. The aim should be eradicating an illness (polio). If this is not possible, then reduce the burden in the society. Withholding vaccines from a child or an adult because of a hypothetical risk places them at risk for real infection that may have real sequelae. The benefits of vaccines are clear. Although the overall prevalence of complete vaccine refusal is <2%, vaccine refusal may result in vaccine-preventable disease in the individual and/or outbreaks of vaccine-preventable disease in unvaccinated and vaccinated individuals.

Recommendations

- World Health Organization (WHO) has listed vaccine hesitancy as one of the 10 threats to global health in 2019. Vaccine hesitancy should be addressed on priority at every level.
- Hepatitis B vaccine protects from hepatocellular carcinoma.
- Human papilloma virus (HPV) vaccine protects from HPV infection, a major cause of cervical cancer.
- Adult vaccination should also be addressed.

Helmets, Seat Belts and Harm Reduction

Preventing head injuries by wearing a bicycle helmet reduces the risk of brain injury. A 2009 systematic review of five case-control studies found that helmets provide 63-88% reduction in the risk of head, brain and severe brain injuries and a 65% reduction of injuries to the upper and mid-face for bicyclists of all ages. Helmets provide similar protection for crashes involving motor vehicles and other causes (70%). In children (<15 years of age), wearing a helmet reduces the risk of head injury by 63% and of loss of consciousness by 86%.

Pregnancy belt

Pregnant women should wear three-point seat belts during pregnancy. The lap belt is placed across the hips and below the uterus; the shoulder belt goes between the breasts and lateral to the uterus. Although there are case reports of maternal and fetal injuries resulting from seat belt use, the overall effect is that seat belts provide significantly more benefit than risk to the mother and fetus in the event of collision.

Recommendations

- Zero tolerance for not wearing helmets and seat belts.
- Govt. should be asked to bring in laws for mandatory cycle helmets, seat belts for back seat passengers, seat belt for bus drivers.
- Awareness should be created about quality of helmets.
- Children below <5 years old should not be allowed to sit in the front seat of a car. Car seats for children to be mandatory.
- In the back seat of a car, the middle seat should always have a seat belt as the person seated in the middle is most at risk.
- The importance of helmets and seat belts should be taught in schools.
- Children from schools in high risk areas should be made to wear helmets while crossing the roads.

Mercury

Going mercury-free is the need of the hour but as a harm reduction strategy on January 19, 2013 in Geneva, the world's governments agreed to end the manufacture, import and export of all mercury-based medical devices— effectively phasing them out by 2020.

Air Pollution

WHO guideline stipulates that PM2.5 should not exceed 10 μg/m^3 annual mean, or 25 μg/m^3 24-hour mean; and PM10 should not exceed 20 μg/m^3 annual mean or 50 μg/m^3 24-hour mean. Each 10 μg/m^3 elevation in fine particulate air pollution was associated with approximately a 4%, 6% and 8% increased risk of all-cause, cardiopulmonary and lung cancer mortality, respectively. But the Indian standards has accepted PM2.5 (60) and PM10 (100) level as harm reduction strategy.

Recommendation

Try to achieve WHO targets for both outdoor (ambient) and indoor pollution, but if the same is not possible one should make all efforts to attain both outdoor and indoor pollution levels as low as possible, as much as possible and as soon as possible. Lower the better!

Trans Fats

The Food Safety and Standards Authority of India (FSSAI) has proposed to limit the maximum amount of trans fat content in vegetable oils, vegetable fat and hydrogenated vegetable oil to 2% by weight as part of its goal to make India trans-fat-free (<0.5%) by 2022. The current permitted level of trans fat is 5% in India.

In 2015, the food regulator set the maximum level of trans fatty acids at 5% in food products from 10% earlier. It directed that the level of trans fats in food products must be disclosed on the label.

The WHO has urged governments across the world to eliminate the use of trans fats from global food supplies by 2023.

Recommendations

- Aim at trans-fat free diet or reduce the amount of trans-fats in diet to the minimum possible.
- Clarified butter (ghee) is better than hydrogenated "Vanaspati" ghee.

Coronary Artery Disease

Bypass surgery and stenting are harm reduction procedures. These are mechanical solutions to a biochemical problem.

Aggressive risk factor harm is recommended in all patients with coronary heart disease even after surgical or stenting intervention.

This includes low-dose aspirin, reaching treatment goals for hypertension and serum lipids, avoidance of smoking, and, in patients with diabetes, controlling blood sugar.

In a follow-up study of 2,970 patients enrolled in the PREVENT IV trial, patients were assessed for the use of aspirin, β-blockers, angiotensin-converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs) and lipid-lowering agents after hospital discharge and at 1 year of bypass surgery. Patients taking ≤50% of these medicines compared with those taking all indicated medications after coronary artery bypass graft (CABG) had a significantly higher 2-year rate of death or myocardial infarction (8% vs. 4.2%).

Recommendation

Harm reduction by reducing all risks (lifestyle management + drug management)!

Osteoarthritis Knee

A dose-response relationship between the extent of percentage change in body weight and improvement in joint symptoms has been demonstrated, with more robust effects achieved when at least a 10% reduction in body weight is attained. A reasonable initial target is a 5-10% weight reduction within a 6-month period and initial goals should be reassessed periodically and individually for each patient.

Recommendations

- Reduction in body weight at least 10%.
- Strengthening exercises.

Diabetic CKD

Recommendations

- In diabetic CKD diet, ACE inhibitors, ARBs, SGLT2 inhibitors and L-/N-type calcium channel blockers can reduce the harm and proteinuria.

- Don't give excess protein. Give adequate protein as per body weight, otherwise protein calorie malnutrition may set in.

HARM REDUCTION IN CLINICAL SETTINGS

Type 2 Diabetes

Diabetes treatment itself is a harm reduction as diabetic complications can only be checked or delayed and not cured.

Most diabetics in uneducated society may not be able to do strict control of diabetes. Harm reduction involves some leniency in the sugar targets in selected groups.

- In fit persons with life expectancy of >10 years, A1c goal can be <7.5% (fasting and preprandial glucoses should be between 140 and 150 mg/dL).
- In elderly or with life expectancy <10 years, the goal can be ≤8% (fasting and preprandial glucoses between 160 and 170 mg/dL).
- In very old (frail patients unable to provide self-care), the goal may be <8.5%.

Recommendation

Strictness of control must be relaxed, especially for the chronically noncompliant patient, elderly and the illiterate patient.

Obesity

It is not important to achieve an ideal weight. The medical aim is to reduce weight to prevent onset of diabetes in obesity. "A modest weight loss of 5-10% in 6 months is enough to delay or prevent the onset of diabetes and other obesity-related illnesses".

Recommendations

Any weight reduction is better than no weight reduction. Even 1 kg of weight loss is good for harm reduction.

Pica

Pica is very common in India due to rampant iron deficiency anemia. Till iron is replaced these people require less harmful substitutes (taste, texture or smell). For example, for women who crave wet dirt, they can smell the wet dirt as they eat a burned toast. Chewing ice can also be a good substitute for dirt. For women who crave the crunch of cement, ice and hot chocolate can be the alternative. For those craving the sour taste of baking powder, sour hard candies can work. Chewing gum substitutes well for the rubber from tires, unless the woman is craving the smell of the rubber.

Recommendation

Correction of iron deficiency anemia.

Fatty Liver

Nonalcoholic fatty liver disease (NAFLD) is a common liver disease in India. Creating awareness is the main harm reduction strategy.

Heavy alcohol use is associated with hepatic steatosis and fibrosis. In a recent cohort study of 285 patients with NAFLD, nondrinkers were more likely to have improvement in steatosis, aspartate aminotransferase (AST) levels, and resolution of steatohepatitis compared with modest drinkers (≤2 drinks/day).

For those who do not want to stop alcohol, there is no safe amount of alcohol, one should lower the dose. Lower the better. Liver can metabolize 10 g of alcohol in 1 hour.

Modest weight reduction may improve liver function in nonalcoholic steatohepatitis (NASH), which is associated with insulin resistance and type 2 diabetes. Patients who are overweight or obese should lose 5-7% of body weight at a rate of 0.5-1.0 kg/week (1-2 lb/week) through lifestyle modifications including dietary therapy and exercise.

For patients with suspected or biopsy-proven NASH, the weight loss goal is higher (7-10% of body weight) in the first 6 months.

In nondiabetic patients with biopsy-proven NASH and fibrosis stage ≥2 vitamin E at a dose of 800 IU daily has been shown to reduce harm.

Recommendations

- Lose body weight; 5-10% of body weight.
- Physicians need to be aware about NAFLD as a disease entity.

High Fever

Fever is temperature >100.4°F. Fever up to 104°F may not be treated in patients without comorbid conditions. But in patients with fever >104°F or with comorbid conditions rapid reduction of fever is harm reduction. Timely paracetamol and nimesulide can reduce the harm.

Empirical Antibiotic

In fever, till reports are available no antibiotic should be stated. But if the clinical situation compels to start an empirical antibiotic, then an older antibiotic like doxycycline can do the maximum harm reduction. Do not give antibiotics which are resistance prone.

Recommendation

Regulatory framework needs to be strengthened, including for e-pharmacy.

HARM REDUCTION IN LIFESTYLE AND BEHAVIORS

Physical Activity

Any activity is better than none. Health officials recommend that people get 150 minutes of moderate exercise per week, but some researchers argue that this recommendation may set the bar too high for some people, and that guidelines should instead focus on getting people to be just a little bit more active.

Recommendation

Some physical activity is better than none.

Noise in Hospital Setting

Hospitals are silent zones and require a noise level of 40 dB in night and 50 dB in day time. The same is impractical in today's date. As a harm reduction strategy several methods can be used to reduce night time noise exposure in the inpatient setting, including ear muffs or ear plugs for patients, sound masking (white noise), installing sound proofing acoustic materials and behavioral modifications ("quiet time" protocols). Patients report modest improvements in sleep with these relatively simple interventions.

Even small decreases in noise levels can improve subjective and observed sleep quality and duration.

Recommendations

- Reduce noise, especially unnecessary noise as much as possible.
- Reduce noise at source.
- Use ear plugs if noise cannot be avoided.
- Smart horns can be proposed to the government to reduce road noise.
- Enforce strict limits of volume and timings for loudspeakers.

Salt Intake

Reduce daily sodium intake to not more than 6 g of sodium chloride/day in persons with hypertension.

Recommendations

- Reduce salt intake as much as possible, lower the better.
- Preserved and packaged foods have maximum salt; reduce them as much as possible.
- Add only normal amounts of salt when cooking.
- Reduce or avoid added salt.
- Reduce salts in snacks.
- Use salt alternatives in food.

Soft Drinks

The consumption of soft drinks and other sweetened beverages (fruit drinks, sports drinks and energy drinks) should be discouraged. These beverages are a major source of added refined sugar and calories in the diet. Sugar-sweetened beverages are a key contributor to weight gain and obesity.

Recommendations

- Harmful: Fructose > sugar > brown sugar > Jaggery > sugarcane > honey
- Harmful: Artificial sweeteners > Stevia
- Harmful: Whole wheat > Wheat >sooji or broken wheat > Maida
- Harmful: White rice > Brown rice
- Harmful: Chasni Indian sweets (50% sugar) > Non-Chasni Indian sweets (30% sugar) > soft drinks (12% sugar) > sports drinks (6% sugar) > ORS (2% sugar)
- Reduce sugar sweetened beverages (contain high-fructose corn syrup), caffeine or quinine energy drinks and processed fruit drinks (contain high sugar).
- Avoid sticky, sugary, fermented foods as they are bad for teeth (dental caries, periodontal disease).
- Rinse mouth/immediately after eating any sweet-meat.

Alcohol Disorder

Abstinence is the best solution but not every individual will be able to achieve this and they may be put on controlled drinking to reduce risk to patients. There is no limit for controlled drinking, lower the

better. Restrict to minimum amount for least days in a week.

Controlled drinking is more likely for people with a mild disorder (or at-risk drinking) and may not be a more severe disorder.

In nonpregnant women and patients without other comorbidities the ideal dose of alcohol for mortality benefit is around 6 g (about one-half of a standard drink) per day. The dose associated with lowest mortality was lower in women than men (4 g/day and 6-7 g/day, respectively).

Recommendations

- No amount of alcohol is safe.
- Harmful: Whisky > white wine > red wine > beer > mead (3% alcohol or honey water).

Substance Disorder

Bystander-administered naloxone by the intramuscular and intranasal routes is used successfully to resuscitate opioid overdose patients. Providing opioid users, family members, and friends with naloxone, accompanied by teaching them how to recognize opioid toxicity, may reduce overdose mortality. Following implementation of a comprehensive opioid overdose prevention program that included take-home naloxone, overdose deaths decreased from 46.6 to 29.0 per 1,00,000. Prescription of naloxone can be given to third parties (bystanders) as part of a harm reduction program.

In street homeless persons, restrictive or punitive policies toward the use of alcohol and/or illicit drugs has not been the solution. Harm reduction programs, such as methadone clinics, needle exchange programs, and safe injection sites, often serve as an alternative health care system for homeless persons with substance use disorders.

HIV Harm Reduction

For all patients at risk for human immunodeficiency virus (HIV) infection, advise consistent condom use. Harm risk reduction counseling reduces behaviors that results in higher risk of HIV infection. Individuals report greater condom use and fewer sexual partners with behavioral risk-reduction interventions.

For IV drug users, harm reduction interventions, such as voluntary opioid substitution therapy and needle exchange programs can reduce risky injection behavior. These strategies are associated with decreases in HIV infection.

Screening and treat sexually transmitted infections (STIs) in individuals at risk for HIV given the shared risk factors for HIV and other STIs, the association of other STIs with HIV infection, and the benefit of treating STIs beyond potential HIV prevention.

For those who have high ongoing risk for HIV infection, daily pre-exposure prophylaxis with tenofovir-emtricitabine effectively reduces the risk of infection.

For those who have had a mucosal or parenteral exposure to HIV within the prior 72 hours, post-exposure prophylaxis with an antiretroviral regimen is associated with a reduced risk of infection.

Circumcision has demonstrated efficacy in reducing the risk of HIV infection among heterosexual men. WHO and the Joint United Nations Programme on HIV/AIDS (UNAIDS) recommend scaling up voluntary male circumcision as a HIV prevention intervention in several African countries with high rates of HIV and low baseline rates of male circumcision. In the United States and Europe, where sexual transmission among men who have sex with men (MSM) is dominant, circumcision has not demonstrated substantial benefit.

Mother-to-child HIV-1 transmission occurs *in utero*, peripartum, and postnatally via breastfeeding; the risk of HIV transmission to the infant can be significantly reduced with antiretroviral medications. Replacement feeding is recommended for infants born to HIV-infected mothers in the resource-rich settings. However, in resource limited settings replacement feeding is associated with greater infant morbidity and mortality from diarrheal disease, pneumonia and other infectious diseases. Exclusive breastfeeding, in combination with antiretroviral interventions, is recommended for the first 6 months of life and subsequently, breastfeeding, along with antiretroviral treatment (with support to encourage adherence during breastfeeding) and appropriate complementary feeding, should continue up to 24 months or longer.

Recommendations

- Abstinence from activities that increase the risk of HIV infection.
- However, if one can't exercise abstinence they should use condom to prevent/reduce harm or go for pre-exposure prophylaxis.

Tobacco Harm Reduction

Tobacco products, primarily combustible cigarettes, are the single greatest avoidable cause of tobacco-related

diseases and kill about 7 million people worldwide each year. The tobacco epidemic in India has also reached alarming levels. As per the latest estimates, there are nearly 106 million people in India who smoke tobacco, 200 million use chewing or smokeless tobacco (SLT) and 32 million who smoke as well as chew tobacco. India is home to roughly 12% of the smokers in the world and close to a million people in the country die every year due to tobacco-related illnesses.

The indirect and direct costs of tobacco-related illnesses and deaths in India are also staggering. As per a report by the Ministry of Health & Family Welfare, Government of India—the total economic costs attributable to tobacco diseases in India in the year 2011 for persons aged 35-69 was Rs. 1,04,500 crores (around US$22.4 billion).

Tobacco cessation treatment is a standard component of health care

Cigarette smoking is a chronic relapsing substance use disorder. Current evidence strongly supports combining pharmacotherapy (slower acting and faster acting nicotine products) and other newer drugs with behavioral/psychosocial interventions as the most effective way to help smokers sustain abstinence.

In India, only slower-acting nicotine replacement therapies (NRTs) are available (patches, gum and lozenges) wherein, patches release more nicotine than gum and lozenges. Faster-acting NRTs such as nasal spray, sublingual tablets and oral inhaler are not available in India. It is important to note that both slower acting and faster acting NRTs are required in any cessation protocol. NRTs provide nicotine to reduce withdrawal symptoms.

However, the available NRTs do not replicate the behavioral aspects of smoking and so have had moderate success in helping smokers quit.

Recommendation

Among smokers who are unable to quit, reducing the amount of smoking may not help. Even at low-dose, smoking combustible tobacco may be harmful. The answer lies in switching to less harmful alternatives till one quits.

Nicotine is not the same as tobacco

- Tobacco contains nicotine but nicotine does not contain tobacco.
- Combustible tobacco is = nicotine + carbon monoxide (CO) + tar (a mix of over 4000 different chemicals produced out of oxidation of the burnt tobacco many of them are Class I carcinogens).
- **Nicotine does not cause cancer.**
- NRT products are safe as cessation tools in heart patients.
- There are currently no rigorous scientific studies conducted on humans that demonstrate nicotine to be as or more dangerous than combustible smoking.

What are ENDS?

Alternative Nicotine Delivery systems (ANDS; electronic nicotine delivery systems (ENDS) are nicotine-based (non-tobacco) vaping products (produce aerosols and not smoke) that do not use combustion (no oxidation, no tar, no carbon monoxide [CO]. They can be considered equivalent to faster-acting NRTs. These can potentially deliver significant public health benefit if they help smokers to quit especially smokers who have not been willing or not been able to quit using current treatments.

Vaping is not same as smoking

Recently, many smokers have transitioned to vaping products in their efforts to quit combustible smoking or reduce harm created by the same. Vaping products contain heated nicotine as well as a variety of flavorings and other additives.

Vaping is not the same as smoking as no combustion takes place. Combustion from smoking generates significant level of tar, carbon monoxide and other chemicals out of which 69 are known carcinogens.

Second-hand smoking or passive smoking from combustion not only increases the risk of coronary heart diseases by 25-40% - almost the same level as a smoker, but also causes numerous health problems in infants and children, including more frequent and severe asthma attacks, respiratory infections, ear infections and sudden infant death syndrome. Third-hand smoking is another emerging threat associated with smoking!

Vaping products on the other hand do not require combustion to deliver nicotine and as a result, do not generate harmful chemicals to the level of conventional cigarettes.

A Juul study presented at the Society for Research on Nicotine and Tobacco 2019 annual meeting in San Francisco found **that ENDS reduce harmful exposure**

to addictive nicotine and chemicals known to cause cancer and present a safe alternative to smoking.

Recently, the American Stroke Association (Abstract 9, Session A2) reported that e-cigarette smokers may have higher odds of stroke, heart attack and coronary heart disease. As per the study, researchers tapped a database of 4,00,000 respondents. That database, the 2016 Behavioral Risk Factor Surveillance System (BRFSS) survey, collected data from residents in all 50 states about their health-related risk behaviors, chronic health conditions and use of preventive services.

Compared with non-users, e-cigarette users were younger, had a lower body mass index and a lower rate of diabetes. Some 66,795 respondents reported ever regularly using e-cigarettes. The control group was the 3,43,856 respondents who reported having never used e-cigarettes. Researchers found compared with non-users, e-cigarette users had: 71% higher risk of stroke; 59% higher risk of heart attack or angina; 40% higher risk of coronary heart disease **and double the rate of cigarette smoking**.

As e-cigarette users had double the rate of cigarette smoking, it was not clear how much was cigarettes responsible for these findings.

Vaping vs. NRTs

A study, published in January 2019 in the *New England Journal of Medicine*, found that e-cigarettes were nearly twice as effective as conventional nicotine replacement products like patches and gum, for quitting smoking. The success rate was 18% among the e-cigarette group, compared to 9.9% among those using traditional NRT.

The study was conducted in Britain and funded by the National Institute for Health Research and Cancer Research, UK. For a year, it followed 886 smokers assigned randomly to use either e-cigarettes or traditional NRTs. Both groups also participated in at least 4 weekly counseling sessions, an element regarded as critical for success.

Is vaping less harmful than combustible cigarettes?

Public Health England: *"Vaping poses only a small fraction of the risks of smoking and switching completely from smoking to vaping conveys substantial health benefits over continued smoking. The previous estimate that, based on current knowledge, vaping is at least 95% less harmful than smoking remains a good way to communicate the large difference in relative risk unambiguously so that more smokers are encouraged to make the switch from smoking to vaping." It has further observed that, "To date, the levels of metals identified in e-cigarette aerosol do not give rise to any significant safety concerns, but metal emissions, however small, are unnecessary." On assessment of exposure to harmful constituents PHE has observed that "biomarkers of exposure assessed to date are consistent with significant reductions in harmful constituents and for a few biomarkers assessed...similar levels to smokers abstaining from smoking or nonsmokers were observed."*

The Royal College of Physicians: *"Toxin levels inhaled from vaping products under normal conditions are likely to be well below prescribed threshold limit for occupational exposure, which make the probability of significant long-term harm unlikely."*

The National Academies of Sciences, Engineering and Medicine (NASEM): *"There is conclusive evidence that completely substituting e-cigarettes for combustible tobacco cigarettes reduces users' exposure to numerous toxicant and carcinogens present in combustible tobacco cigarettes" and there is substantial evidence that completely switching from regular use of combustible tobacco products to vaping results in reduced short-term adverse health outcomes in several organs systems." As such, NASEM has concluded that "e-cigarettes pose less risk to an individual than combustible tobacco cigarettes" and "complete switching from combustible tobacco cigarettes to e-cigarettes would be expected to reduce tobacco-related health risk." Lead authors of the NASEM report on vaping, Drs. Eaton and St. Helen, also published a follow-on Evidence to Practice article, which recommended that, "if a smoker's initial treatment has failed or not been tolerated, or if the smoker refuses to use approved medications and counseling and wishes to use e-cigarettes to aid quitting, physician should encourage the smoker to switch completely to e-cigarettes. We agree with Public Health England that behavioral support should be provided to smokers who want to use e-cigarettes to help them quit smoking, and that health professionals should receive education and training in use of e-cigarettes in quit attempts."*

The American Cancer Society has issued a statement that stipulates basis the available scientific evidence, the use of vaping is less harmful than smoking cigarettes. It has further observed that despite clinical advice, many smokers "*…will not attempt to quit smoking cigarettes and will not use FDA approved cessation medications. These individuals should be encouraged to switch to the least harmful form of tobacco product possible; switching to the exclusive use of e-cigarettes is preferable to continuing to smoke combustible products.*"

The American Heart Association (AHA) in 2014 observed in a policy statement that *"E-cigarettes either do not contain or have lower levels of several tobacco-derived harmful and potentially harmful constituents compared with cigarettes and smokeless tobacco. In comparison with NRTs, e-cigarette use has increased at an unprecedented rate, which presents an opportunity for harm reduction if smokers use them as substitutes for cigarettes."*

In a 2016 report, the US Surgeon General called e-cigarette use among young people a "public health concern." AHA shares that view. The AHA supports maintaining the Food and Drug Administration's regulatory authority over e-cigarettes along with other tobacco products.

David B. Abrams from the College of Global Public Health, New York University, writes in the April 2018 issue of Annual Review of Public Health: *"A diverse class of alternative nicotine delivery systems (ANDS) has recently been developed that do not combust tobacco and are substantially less harmful than cigarettes. ANDS have the potential to disrupt the 120-year dominance of the cigarette and challenge the field on how the tobacco pandemic could be reversed if nicotine is decoupled from lethal inhaled smoke. ANDS may provide a means to compete with, and even replace, combusted cigarette use, saves more lives more rapidly than previously possible."*

Recommendations

- To refrain from initiation of consumption of any tobacco product and related harm reduction product and quit as soon as possible.
- Transitioning to a relative harm reduction product should be considered while in the process of quitting.
- Vaping, as per NEJM report, can be considered as an alternative to faster-acting NRTs with more success than available NRTs.
- Vaping products can present an important and critical public health opportunity for existing smokers and must be used under appropriate regulations and support from medical fraternity.
- All individuals/patients should be consistently advised to quit using any form of tobacco products or related products completely.
- Caution should be exercised against the concurrent use of vaping products and combustible cigarettes.
- Based on currently available evidence, using current generation vaping products is less harmful than smoking cigarettes, but the health effects of long-term use are not known.

Summary

- Best option: Say no to smoking and tobacco products. Make all efforts to quit including behavioral counseling.
- If cannot them minimize harm by transitioning to safer nicotine based alternatives (faster- acting and slower-acting NRTs), approved drugs and consider vaping if all fails. Smokers, who want to use NRTs should also be evaluated for depression, anxiety.

Policy Recommendations

The Government of India should frame policies and regulations of vaping products that addresses:

- Marketing, Youth access, Labeling, Quality control over manufacturing and Standards for contaminants.
- Further, such regulations should allow adults to access quality-controlled products in their efforts to stop use of combustible smoking with the objective to reduce harm.
- Government of India should allocate funds for independent and continued research on the health effects of vaping products and guide their policies from time to time basis such evidence.
- With respect to vaping products, manufacturers should be disallowed from making any unproven health claims until unless the same has been approved by a relevant authority of the Ministry of Health & Family Welfare, Government of India.

Slogans

For nonsmokers: Say no to smoking and tobacco products.

For smokers: Quit - Quit- and Quit and till you Quit, switch to less harmful nontobacco alternatives.

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Study Shows Poor Hand Hygiene Compliance Among EMS Providers

A study published online in *Emergency Medicine Journal* found that hand hygiene compliance among emergency medical service (EMS) providers was remarkably low, with higher compliance after patient contacts compared with before patient contacts, and an over-reliance on gloves.

Use of hand rub or hand wash was observed: before patient contact, 3%; before clean/aseptic procedures, 2%; after the risk of body fluids, 8%; after patient contact, 29% and after contact with patient-related surroundings, 38%. Gloves were worn in 54% of all HH indications. Adherence to short or up done hair, short, clean nails without polish and no jewellery was 99%, 84% and 62%, respectively.

Cabinet Approves Proposal for Promulgation of the Indian Medical Council (Amendment) Second Ordinance, 2019

The Union Cabinet chaired by Prime Minister Narendra Modi has approved two proposals: Promulgation of an Ordinance, namely "the Indian Medical Council (Amendment) Second Ordinance, 2019"; and to bring in necessary official amendments in the Indian Medical Council (Amendment) Bill, 2018 pending in Parliament for replacing the said Ordinance.

The proposal will enable the Board of Governors (BoG) appointed in supersession of Medical Council of India (MCI) as per the provisions of earlier Ordinance to continue to exercise the powers of MCI and that of Central Government under Section 10A of the Indian Medical Council (IMC) Act, 1956 so as to ensure transparency, accountability and quality in the governance of medical education in the country. It will ensure that the work already done by the BoG as per provisions of earlier Ordinance is validated and may continue… (*PIB, Cabinet, February 19, 2019*)

Pseudomembranous Colitis: Do we Need a Screening?

ASHISH GAUTAM*, PRABHAT AGRAWAL*, ABHISHEK RAJ*, ASHWINI K NIGAM*, SUBHASH CHANDRA*, MANISH K BANSAL†

ABSTRACT

In the last few decades, increasing use of antibiotics has dramatically increased the incidence of antibiotic-associated diarrhea. An unopposed homing of *Clostridium difficile* in intensive care unit (ICU) and wards puts forward new challenges for physicians. Development of diarrhea during or just after hospital stay, especially in old patients, is a typical clinical presentation of *C. difficile* diarrhea. Cytotoxin assay from tissue culture is a gold standard diagnostic test but its poor availability, high cost, time bound results and rapid development of life-threatening complications made us to think of a screening test. Demonstration of pathognomonic summit lesions and pseudomembrane with colonoscopy or sigmoidoscopy is relatively inexpensive, easily available and diagnosis is prompt. Our experience in few patients with colonoscopy makes us recommend it as a screening test for all clinically suspected patients. It is refuted as first-line investigation because of good number of false negative results but demonstration of pathognomonic lesions even in few patients saves the life with minimal expenditure and least time wastage before initiation of definitive treatment.

Keywords: Pseudomembranous colitis, summit lesion, antibiotic-associated diarrhea

Clostridium difficile is a Gram-positive, anaerobic, spore-forming bacillus with toxicogenic property. Its presence in intensive care units (ICUs), wards and now even in outpatients has put forward new challenges for treating physicians. Moreover, the cost of treatment and hospital stay increases only because of inadvertent antibiotic use and failure to follow aseptic precautions.

CLINICAL FEATURES

Infection from *C. difficile* has a wide-spectrum of presentation i.e., from asymptomatic carriage to fulminant colitis. Pseudomembranous colitis (PC) is one of the rare but catastrophic presentations of *C. difficile* infection. Other uncommon presentations are non-PC and a milder form of *C. difficile* diarrhea. Collectively, these presentations are called *C. difficile*-associated diarrhea (CDAD). Besides being associated with *C. difficile*, PC can occur in less than 25% of other bacterial, viral and toxic causes of diarrhea, gastroenteritis and anorectal fistulas.

A patient of PC is typically an old age patient with history of antibiotic use during hospitalization, who develops recurrent diarrhea with or without blood in stools. Rarely, patient can present with hypoproteinemia and electrolyte imbalance, hypotension, toxic megacolon, severe sepsis or bowel perforation. Besides age and antibiotic use, other risk factors for PC are use of proton pump inhibitors, nonsteroidal anti-inflammatory drugs (NSAIDs), chronic kidney disease (CKD) and methicillin-resistant *Staphylococcus aureus* (MRSA) co-infection. Rarely, abdominal and pelvic surgeries, Shigella infection, Crohn's disease, neonatal necrotizing enterocolitis, intestinal obstruction, Hirschsprung's disease and colonic carcinoma are associated with development of PC.

DIAGNOSIS

The gold standard for diagnosis of *C. difficile* infection is cytotoxin assay that uses tissue culture. It takes 24-72 hours for reporting and also is not easily available even at tertiary healthcare centers. An alternative enzyme immunoassay (EIA) of toxin A and B of *C. difficile* is less sensitive with 10-20% false negative rate but is relatively easily available and gives result within 24 hours. Diagnostic colonoscopy or sigmoidoscopy is less sensitive with high false positive rates for asymptomatic and nonpseudomembranous type of CDAD. Presence of pathognomonic feature summit

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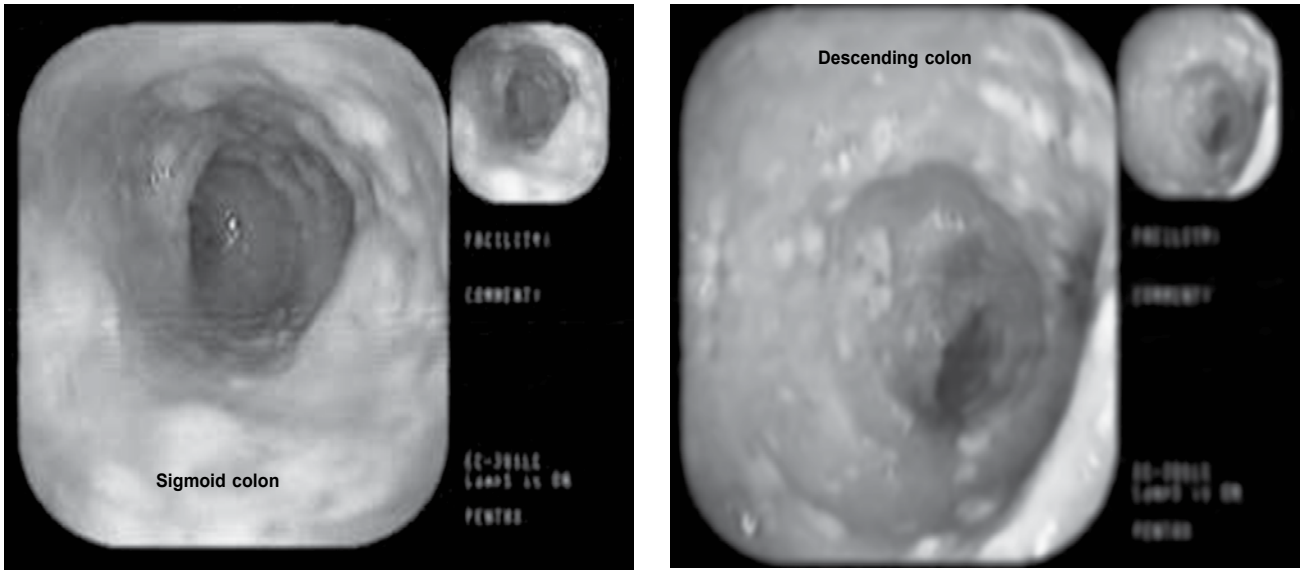

Figure 1. Colonoscopy demonstrates multiple yellow white spots in descending and sigmoid colon.

lesions and pseudomembrane on colonoscopy promptly make diagnosis of PC and usually do not require tissue culture or EIA. PC is sometimes a fatal condition and requires urgent initiation of treatment. Johal et al, in a study of 136 patients, suggest routine sigmoidoscopy in all clinically suspected patients where stool cytotoxin is negative for *C. difficile*. Although CDAD can present with normal appearing colonic mucosa, still a screening colonoscopy of patient with typical clinical presentation can easily clinch the diagnosis of PC and early institution of definitive treatment. Also, colonoscopy is available easily at small cities in India, where the facility of tissue culture and EIA for toxin A and B is not available. Colonoscopy is relatively inexpensive, allows assessment of disease severity and facilitates subsequent management. Ulcerative colitis, Crohn's disease, infectious colitis and other similar conditions can be easily differentiated after colonoscopy. We present here two cases in which an early colonoscopy helped us make out an early diagnosis and institute specific therapy that saved the lives of patients.

CASE 1

A 64-year-old female patient was shifted from orthopedic recovery ward to medicine ward for complaint of severe diarrhea since 5 days. She had been operated for hip fracture 20 days back and was in recovery phase. Most of her antibiotics had been stopped 3 days back when she developed first diarrheal episode. A presumptive diagnosis of antibiotic-associated diarrhea was made and she was put on probiotics. Her general condition continued to worsen so her stool was sent for culture and intravenous ciprofloxacin and metronidazole were started. Ultrasonography of abdomen was normal. Her colonoscopy was planned till report of culture was awaited. Her colonoscopy demonstrated multiple yellow white spots in transverse, descending and sigmoid colon (Fig. 1) with continuous membrane in rectum and anal canal. Her general condition rapidly started improving and she became asymptomatic after 10 days of intravenous and 4 days of oral metronidazole therapy. Retrospective evaluation of antibiotic use disclosed that she was given cephalosporins and aminoglycosides after surgery. Stool culture report later confirmed presence of Clostridium species.

CASE 2

A 72-year-old female was admitted for bleeding per rectum, loose stools since past 3 weeks, pedal edema and altered senses since past 1 week. She was operated and given intravenous clindamycin for gangrene of right middle finger 2 weeks prior to development of loose stools. Her vitals were stable and except for presence of pallor and anasarca, general examination was normal. She was drowsy but no neurological deficit was observed. Abdomen was soft and nontender and there was no apparent organomegaly. Her hemoglobin was 3.5 gm%; serum albumin was 2.13 gm%, serum creatinine 0.75 mg%, and alanine aminotransferase/aspartate aminotransferase (ALT/AST) were 34/24 U/l. *Escherichia coli* × 10^6 was grown on stool culture with sensitivity for all third- and

Table 1. Differences Between Antibiotic-associated Diarrhea from *C. difficile* Infection and from Other Causes

Characteristic	AAD from *C. difficile* infection	AAD from other causes
Most commonly implicated antibiotics	Clindamycin, cephalosporins, penicillins, fluoroquinolones	Clindamycin, cephalosporins, ampicillin or co-amoxiclav
History	Usually no history of antibiotic intolerance	History of diarrhea with antibiotic therapy is common
Clinical features		
Diarrhea	May be florid; evidence of colitis with cramps, fever and fecal leukocytes is common	Usually moderate in severity (nuisance diarrhea) without evidence of colitis
Findings on CT or colonoscopy	Evidence of colitis is common; pseudomembranes often are present	Usually normal
Complications	Hypoalbuminemia, anasarca, toxic megacolon; relapse can occur after treatment with metronidazole or vancomycin	Usually none except occasional cases of volume depletion
Results of assay for *C. difficile* toxin	Positive	Negative
Epidemiologic pattern	May be epidemic or endemic in hospitals or long-term care facilities	Sporadic
Treatment		
Withdrawal of implicated antibiotic	Condition can resolve but often persists or progresses	Condition usually resolves
Antiperistaltic agents	Contraindicated	Often useful
Oral metronidazole or vancomycin	Prompt response	Not indicated

fourth- generation cephalosporins. She was given ceftriaxone 1 g b.i.d. and metronidazole 100 mL t.d.s. Total 6 units of blood transfusion was done and 100 mL of intravenous albumin was given for 6 days. Her general condition improved but except for diarrhea all symptoms subsided. Ultrasonography of abdomen showed an ill-defined mass of 2.6 × 3.2 cm in right iliac fossa with bilateral minimal pleural effusion. Her sigmoidoscopy demonstrated yellow white membranous layer on colonic mucosa with intermittent bleeding ulcer. In descending colon, the membrane scattered into spots and normal appearing intermittent mucosa. These lesions were summit lesions, which were pathognomonic of PC. She was started with vancomycin after which she improved dramatically in 48 hours and complete recovery occured in next 14 days.

Many more cases present to us but most of them respond very well to oral metronidazole therapy. So, based on above experience, we propose to use sigmoidoscopy as screening test for patients who are suspected to have antibiotic-associated diarrhea on clinical grounds. A keen observer can easily make diagnosis of PC on colonoscopy if typical lesions are present. The prime concern is to differentiate between antibiotic-associated diarrhea from *C. difficile* and antibiotic-associated diarrhea due to other causes. Table 1 differentiates between the clinical features and treatment of above two.

DISCUSSION

Pseudomembranous colitis is a rare but frequently fatal presentation of CDAD. Although gold standard for diagnosis of *C. difficile* infection is cytotoxin assay that uses tissue culture, still colonoscopy in an unprepared bowel, which is considered inappropriate for diagnosis, can be sometimes rewarding. Demonstration of pathognomonic summit lesions on colonoscopy makes prompt diagnosis and enables rapid institution of specific treatment and is thus lifesaving. We hereby recommend a diagnostic colonoscopy as screening test in all clinically suspected patients of antibiotic-associated diarrhea. It is easily available, makes prompt diagnosis and helps to differentiate from other similar conditions, is relatively less expensive, needs only a keen observer at cost of high false negative rate.

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Living Near Convenience Stores could Increase Risk of Atherosclerosis

A new study published in the *Journal of the American Heart Association* has shown a 34% increase in the likelihood of developing atherosclerosis with each 10% increase in nearby convenience stores. In the study, researchers examined 10-year data from the Coronary Artery Risk Development in Young Adults study and compared changes in CAC results over that time to changes in the percentage of convenience stores and fast food restaurants within about 2 miles of the participant's house.

Panic Button Becomes Available to Women with Launch of ERSS and Pan-India Emergency Number 112

The Union Home Minister Shri Rajnath Singh and Minister for Women and Child Development, Smt. Maneka Sanjay Gandhi jointly launched the Women Safety Initiative of Emergency Response Support System (ERSS) in 16 States/UTs and Mumbai city. People in these states and UTs can now call a single pan-India number 112 for any emergency. In addition, Investigation Tracking System for Sexual Offences (ITSSO) and Safe City Implementation Monitoring Portal were also launched. Speaking on the occasion, Shri Rajnath Singh said launch of ERSS is a "milestone in women safety in the country." (*PIB, Ministry of Women and Child Development, February 19, 2019*)

Greater Reduction in Body Fat Percentage with Interval Training

A systematic review and meta-analysis comparing moderate-intensity continuous training with high-intensity interval training concluded that both interval training and moderate-intensity continuous training reduce body fat percentage (%). But, interval training provided 28.5% greater reductions in total absolute fat mass (kg) than moderate-intensity continuous training. These findings are published online February 14, 2019 in the *British Journal of Sports Medicine*.

Clinical and Laboratory Evaluation of Patients with Fever with Thrombocytopenia

SHANKAR R RAIKAR*, PANNA K KAMDAR†, AJAY S DABHI†

ABSTRACT

Aims: To evaluate clinical profile of fever with thrombocytopenia. To identify the causes of fever with thrombocytopenia. To assess the clinical complications associated with fever and thrombocytopenia. **Material and methods:** This study was done on patients, who were admitted to Sir T Hospital and Government Medical College, Bhavnagar, Gujarat. We prospectively collected a series of 100 patients with fever and thrombocytopenia. **Results:** ***Age and sex distribution:*** In this study, males outnumbered females. ***Platelet count and bleeding:*** Of 100 patients, four had bleeding manifestations. There was no correlation between platelet count and bleeding. ***Degree of thrombocytopenia in various diseases:*** (1) *Viremia:* Among infectious cases, viremia including dengue accounted for the vast majority. In this study, out of 100 cases viremia including dengue accounted for 52 cases. (2) *Dengue:* In our study, dengue caused severe thrombocytopenia. Twenty patients out of 40 cases had count <50,000/mm^3. (3) *Malaria:* In our study, malaria **c**aused mild-to-moderate thrombocytopenia with counts remaining between 50,000 to 1 lacs in most cases. ***Bleeding manifestations:*** In our study, out of 100 patients only four patients presented with bleeding manifestations. Three patients of mixed *Plasmodium vivax* with *Plasmodium falciparum* malaria presented with petechiae, purpura and hematuria. One patient of dengue presented with gum bleeding. ***Platelet count and fever:*** In this study, shortest duration of fever was 3 days and longest was 10 days. Platelet count started increasing from 2nd day of admission to 8th day of admission with relative treatment. ***Enteric fever:*** In our study, out of 100 patients, three had fever with thrombocytopenia without any bleeding manifestations.

Keywords: Dengue, malaria, viremia, enteric fever, hematuria

Fever is a pervasive and ubiquitous theme in human myth, art and science. Fever is such a common manifestation of illness that it is not surprising to find. New interest has surfaced in the relationship between body temperature and disease. Interleukin (IL)-1 has now been shown to have a major role in thermoregulation.

AIMS AND OBJECTIVES

- To evaluate clinical profile of fever with thrombocytopenia.
- To identify the cause of fever with thrombocytopenia.
- To assess the complications associated with fever and thrombocytopenia.

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MATERIAL AND METHODS

This study was done on patients, who were admitted to Sir T Hospital and Government Medical College, Bhavnagar, Gujarat. We prospectively collected a series of 100 patients with fever and thrombocytopenia.

Inclusion Criteria

The patients of both sexes aged >12 years were included. Patients admitted with fever and found to have thrombocytopenia were included in the study.

Exclusion Criteria

Patients <12 years were excluded. Patients with fever and no thrombocytopenia were not included. Patients with thrombocytopenia and no fever were not included.

Method

Once the patients admitted with fever who had thrombocytopenia were included, a careful history was recorded and general physical examination was done. Detailed examination of various systems was done. Routine investigation was done; specific and special investigations were done as and when indicated.

Patients in whom a final definite diagnosis was reached, were treated for the disease and platelet count was repeated at the time of discharge. Details of history, general physical examination and laboratory and technical investigation reports were noted down from time to time. Once the specific diagnosis was reached, patients were treated for it specifically and symptomatically.

RESULTS

In our study, out of 100 patients, 52 were having dengue (37 M, 15 F), 21 patients were having *Plasmodium vivax* malaria (16 M, 5 F), 21 patients were having *Plasmodium falciparum* malaria (15 M, 6 F), three male patients were having mixed *P. vivax* and *P. falciparum* malaria, three patients were having enteric fever (2 M, 1 F) (Table 1 and Fig. 1).

Table 1. Distribution of Disease

Age	Male	Female	Disease	Total
12-30 years	29	11	Dengue	40
30-45 years	6	2	Dengue	8
45-60 years	2	1	Dengue	3
>60 years	0	0	Dengue	0
12-30 years	12	1	*P. vivax*	13
30-45 years	2	3	*P. vivax*	5
45-60 years	2	1	*P. vivax*	3
>60 years	0	0	*P. vivax*	0
12-30 years	8	2	*P. falciparum*	10
30-45 years	3	1	*P. falciparum*	4
45-60 years	2	1	*P. falciparum*	3
>60 years	2	2	*P. falciparum*	4
12-30 years	1	1	Enteric fever	2
30-45 years	1	0	Enteric fever	1
45-60 years	0	0	Enteric fever	0
>60 years	0	0	Enteric fever	0
12-30 years	1	0	*P. vivax* + *P. falciparum*	1
30-45 years	1	0	*P. vivax* + *P. falciparum*	1
45-60 years	1	0	*P. vivax* + *P. falciparum*	1

Age and Sex Distribution

In our study, males were affected more than females. Young males (12-30 years) were affected more than young females (12-30 years) (Table 2 and Fig. 2).

Degree of Thrombocytopenia in Various Diseases

In our study, dengue was the commonest cause. Lowest platelet count in each disease and its relation to male and female is shown in Table 3.

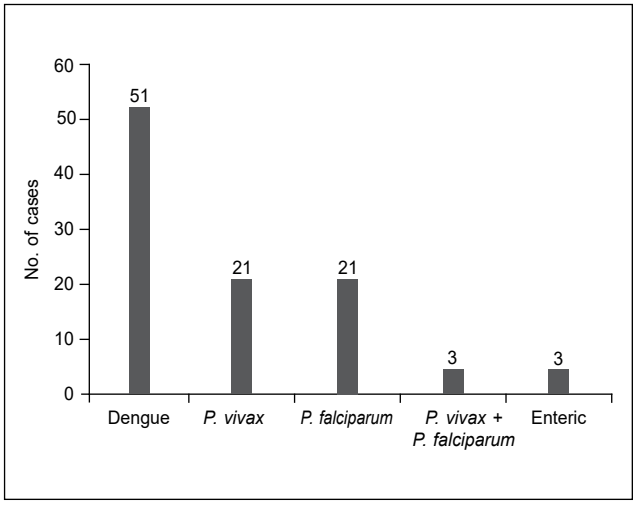

Figure 1. Distribution of disease.

Table 2. Sex-wise Distribution of Cases

Disease	Male (%)	Female (%)	Total (%)
Dengue	37	15	52
P. vivax malaria	16	5	21
P. falciparum malaria	15	6	21
P. vivax + *P. falciparum* malaria	3	0	3
Enteric fever	2	1	3

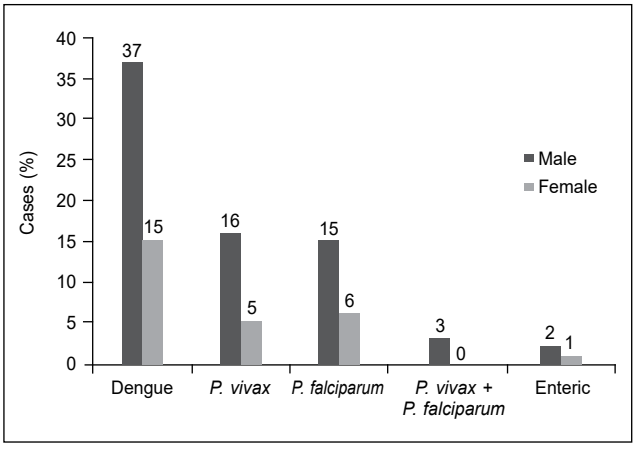

Figure 2. Male and female distribution of disease.

Table 3. Sex-wise Platelet Count

Disease	Lowest platelet count in male	Lowest platelet count in female
Dengue	10,000	13,000
P. vivax malaria	28,000	20,000
P. falciparum malaria	12,000	25,000
Enteric fever	90,000	50,000

Table 4. Relationship Between Day of Fever and Platelet Count

Disease	Day of admission with lowest platelet count	Day of admission with normal platelet count
Dengue	1-2	4-5
P. vivax malaria	1-2	4-5
P. falciparum malaria	1-3	4-7
Enteric fever	1-2	4-5

Table 5. Relation of Month of Year and Number of Cases for Each Disease

Disease	No. of cases in October	No. of cases in November	No. of cases in December
Dengue	10	22	20
Malaria	12	18	12
Enteric fever	02	01	00

Relation Between Day of Fever and Platelet Count

In our study, low platelet count was seen on the day of admission, which started rising from Day 3 to 4, and reached to normal value on average of 4 to 7 days of admission (Table 4).

Relation of Season (Month of Year) and Number of Cases for Each Disease

In our study, maximum number of cases of fever with thrombocytopenia were seen mainly during rainy and early winter season (Tables 5 and 6; Fig. 3.).

CONCLUSION

Febrile illness accounts for large number of cases with thrombocytopenia. Incidence is more in males compared to females. Maximum prevalence is in the younger age group; 66% of cases were seen in 12-30 years age group in our study. Least prevalence was in elderly age group (10%). Fever was the presenting complaint in all 100 cases. Bleeding manifestations were very rarely seen in our study.

Table 6. Relation of season to Number of Cases for Each Disease

Disease	Season
Dengue	Rainy/Winter
Malaria	Rainy/Winter
Enteric fever	Rainy/Winter

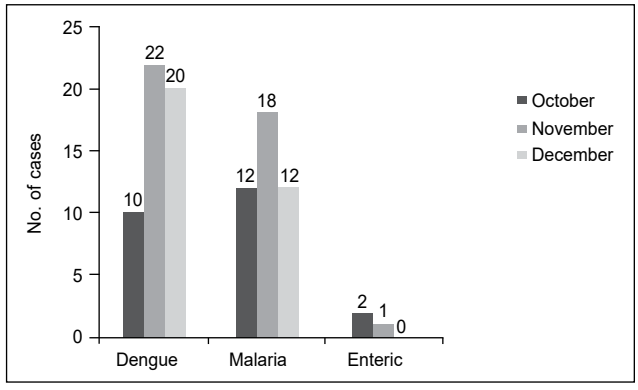

Figure 3. Seasonal distribution of disease.

Patients who had hematuria had relatively low platelet count, <20,000/mm^3. Viremia was the commonest cause of thrombocytopenia in our study including dengue (52% of cases). Bleeding time had no relation to platelet count or bleeding manifestation. No mortality was seen in our study. *P. vivax* malaria accounted for 21% of cases and *P. falciparum* malaria for 21% of cases. Mixed infection, i.e., combined *P. vivax* and *P. falciparum* malaria accounted for 3% of cases. Bacterial infection in our study was mainly seen with enteric fever. Enteric fever accounted for 3% of cases of fever with thrombocytopenia. Thrombocytopenia due to infectious diseases showed seasonal variation, commonly seen in rainy and winter season.

SUMMARY

- Thrombocytopenia is a commonly observed hematological entity.
- Viremia accounts for most cases.
- Platelet count should be asked in cases with fever.
- Thrombocytopenia has no correlation to mortality and morbidity.
- There is no relation between platelet count and bleeding manifestations.
- The condition in which thrombocytopenia develops has an important influence on bleeding

when associated with infection or uremia; bleeding can occur even with mildly reduced counts as additional functional defects contribute.

- Thrombocytopenia due to infectious diseases shows seasonal variation, commonly seen in rainy and winter season.

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Spending on Health Increases Faster than Rest of Global Economy

Spending on health is outpacing the rest of the global economy, particularly in low- and middle-income countries, the WHO said. According to the UN health agency, "countries are spending more on health, but people are still paying too much out of their own pockets". The agency's new report on global health expenditure reveals that "spending on health is outpacing the rest of the global economy, accounting for 10% of global gross domestic product (GDP). The trend is particularly noticeable in low- and middle-income countries where health spending is growing on average 6% annually compared with 4% in high-income countries.

Health spending is made up of government expenditure, out-of-pocket payments and other sources, such as voluntary health insurance and employer-provided health programs. While reliance on out-of-pocket expenses is slowly declining around the world, the report notes that in low- and middle-income countries, domestic public funding for health is increasing and external funding in middle-income countries, declining… (*WHO, February 20, 2019*)

India could be Cervical Cancer Free by 2079

Cervical cancer could be eliminated as a public health problem in India within the next 60 years by making existing prevention programs such as the human papillomavirus (HPV) vaccine and cervical screening more accessible. The estimates, which are the first of their kind at a global-scale, indicate that up to 13.4 million cases of cervical cancer could be prevented within 50 years if intervention strategies are scaled-up by 2020. The average rate of annual cases across all countries could fall to less than 4 cases per 1,00,000 women by the end of the century -- which is a potential threshold for considering cervical cancer to be eliminated as a major public health problem.

For countries with medium levels of development, including India, Vietnam and the Philippines, this could be achieved by 2070-79, according to the study published in *The Lancet Oncology* journal… (*The New Indian Express-PTI, February 21, 2019*)

Adult-onset Still's Disease: Rare But not Uncommon

AAKASH SHAH*, KRUPA PATHAK†, ARCHANA GANDHI‡, SMITA TRIVEDI#

ABSTRACT

Adult-onset Still's disease (AOSD) is a rare clinical entity without any known etiology that characteristically presents with fever, rash, arthritis, along with other systemic manifestations. We present the case of a 26-year-old male who presented with multiple joint pain, high-grade fever and rash since 2 months. The patient was extensively evaluated for pyrexia of unknown origin and treated with weeks of intravenous antibiotics without any benefit. Applying Yamaguchi's criteria, he was diagnosed to have AOSD. Patient responded very well to systemic steroids and fever and joint symptoms resolved completely. He required addition of methotrexate as steroid-sparing agent as attempts of tapering prednisolone led to recurrence of symptoms. AOSD remains a very rare but treatable cause of fever and joint pain and high index of suspicion is required for diagnosis.

Keywords: Adult-onset Still's disease, ferritin, Yamaguchi criteria, methotrexate, pyrexia of unknown origin

Adult-onset Still's disease (AOSD) is a rare but treatable cause of pyrexia of unknown origin and joint pain and high index of suspicion is required for the diagnosis. We present the case of a 26-year-old male who had typical features of AOSD for 2 months; however, remained undiagnosed till presentation to our hospital.

CASE REPORT

A 26-year-old male presented with multiple joint pains, throat pain, evening spiking high-grade fever and an evanescent skin rash aggravating during fever spike, since last 2 months. He was treated with multiple intravenous (IV) and oral antibiotics and analgesics, without any benefit. The joint pain and swelling affected shoulders, elbows, wrists, knees and ankle joints. On examination in our hospital, patient was febrile with temperature of 102°F, with a pulse rate of 116/min and blood pressure of 126/78 mmHg. There was erythematous nonblanching, nonpruritic, nonpalpable maculopapular rash present over the back, arm and thigh (Fig. 1 a and b). Throat and posterior pharyngeal wall were mildly congested. There were multiple subcentimetric mobile and normal consistency cervical and inguinal lymph nodes. Musculoskeletal examination showed symmetric synovitis of bilateral wrists, metacarpophalangeal joints, proximal interphalangeal joints, knees and ankle joints. Mild hepatomegaly was noted and rest of the systemic examination was normal.

Laboratory investigations revealed leukocytosis (16,500/mm^3), normocytic anemia (Hb 10.3 g/dL), with elevated erythrocyte sedimentation rate (ESR) (90) and C-reactive protein (CRP) (96 mg/L), and elevated liver enzymes (SGPT [127 IU/mL]; SGOT [54 IU/mL] and ALP [203 IU/mL]). Serum ferritin was raised (550). Serology for Dengue NS-1, IgM; Chikungunya IgM; antistreptolysin O (ASO) titer (84.98 IU/mL) was negative. Serology for hepatitis B, hepatitis C and human immunodeficiency virus (HIV) was negative. Blood, urine and throat swab cultures were negative. Rheumatoid factor (RF) and anti-cyclic citrullinated peptide (anti-CCP) were negative. Antinuclear antibody (ANA) by IF showed 1:100 with coarse speckled pattern; however, extractable nuclear antigens (ENA) profile by immunoblot was negative. Chest X-ray was normal and in X-rays of hands, no erosive changes were seen. Contrast-enhanced computed tomography (CECT) of chest, abdomen and pelvis showed hepatomegaly with fatty infiltration. Cardiac 2D Echo was normal without any evidence of infective endocarditis.

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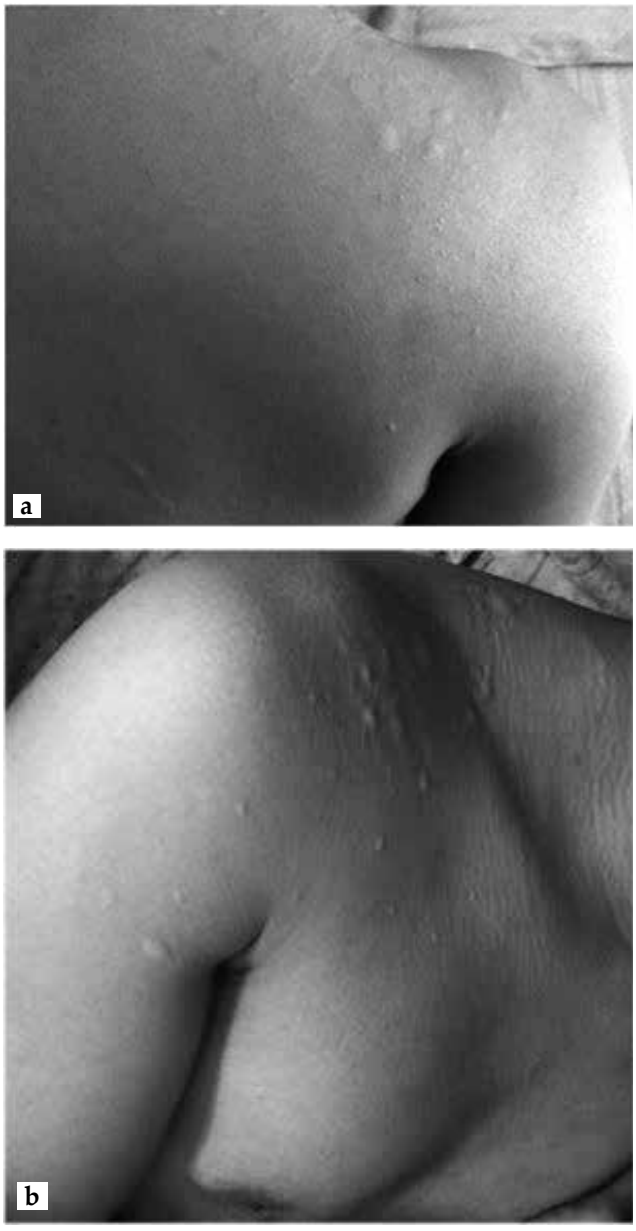

Figure 1 a and b. Rash over back and arm.

Based on his clinical features and laboratory investigations, he was diagnosed as having AOSD. Patient showed improvement on systemic steroids and oral methotrexate 15 mg once a week was added as steroid-sparing drug. Patient discontinued all medications after 3 months and remained asymptomatic.

DISCUSSION

Adult-onset Still's disease refers to a rare systemic autoinflammatory condition with infection, environmental and genetic predisposition being considered as few etiologies; however, none of them is confirmed. Young adults are affected with female preponderance and bimodal age distribution (15-25 and 36-46 years); however, it can also be seen in elderly individuals. Yamaguchi and Cush criteria are proposed for classification of AOSD.

The innate immune response gets activated by pathogens, leading to activation of inflammasomes by activation of cytosolic NLRP3 gene. This activates the pro-inflammatory cascade of inflammatory cytokines (interleukin [IL]-1, IL-6), tumor necrosis factor (TNF)-α, interferons (IFN-α, INF-β) and complement system, which subsequently results in articular and systemic manifestations.

Typically, patient presents with high-grade quotidian fever (>101°F) with evening spikes, arthralgias, sore throat and rash. The characteristic rash of AOSD is transient, nonpruritic, salmon-colored, macular or maculopapular lesions, observed during febrile episodes and may be located on trunk and proximal extremities. Lymphadenopathy, hepatosplenomegaly, pericarditis, pleuritis, pleural effusion and rarely central nervous system (CNS) involvement, like aseptic meningitis or sensorineural hearing loss, may be present. Severe untreated cases can lead to life-threatening macrophage activation syndrome (MAS) or reactive hemophagocytic syndrome.

Laboratory studies show normocytic anemia, leukocytosis with neutrophilic predominance and raised inflammatory markers (ESR, CRP) and deranged liver transaminases. About 50-70% patients have elevated ferritin. Low glycosylated ferritin increases the diagnostic sensitivity and specificity to 70.5% and 83%. Autoimmune serology is negative. Bone marrow aspiration and biopsy may show hemophagocytosis. Synovial fluid analysis reveals inflammatory features. The radiographs of involved joints may show erosive changes in chronic phase.

The differential diagnosis includes bacterial sepsis, viral infections like Epstein-Barr virus, cytomegalovirus, hepatitis B virus, hepatitis C virus, HIV, coxsackievirus and parvovirus, tuberculosis, Lyme disease, malignancies and autoimmune rheumatic diseases. The clinical course of AOSD can be variable and usually three distinct patterns are seen - monophasic, intermittent and chronic. The chronic pattern patients are at increased risk of amyloidosis due to prolonged systemic inflammation.

Treatment includes nonsteroidal anti-inflammatory drugs (NSAIDs), systemic steroids and disease-modifying antirheumatic drugs (DMARDs), such as methotrexate, leflunomide, cyclosporine and

azathioprine. For resistant patients, IL-1 and IL-6 inhibitors are the treatment of choice. Tocilizumab, an IL-6 inhibitor, is available in India. TNF-α inhibitors (infliximab, etanercept and adalimumab) can also be used in articular symptoms; however, they are not as effective on systemic symptoms.

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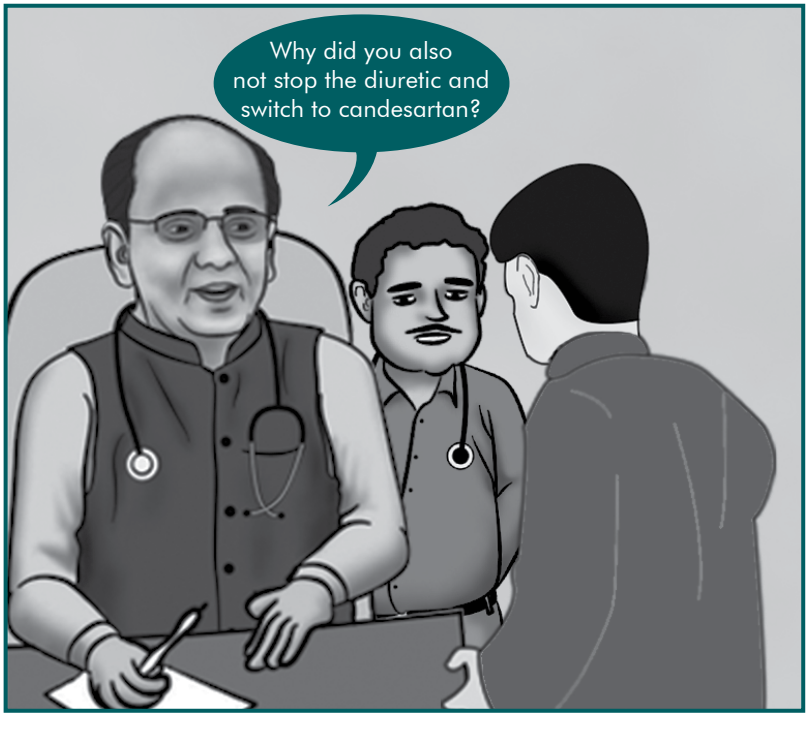
SITUATION: A 40-year-old hypertensive patient on a diuretic who complained of dizziness was advised lifestyle modifications.



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'Wine Glass' Sign in a Case of Juvenile Amyotrophic Lateral Sclerosis

ARVIND VYAS*, DIVYA GOEL†

ABSTRACT

Amyotrophic lateral sclerosis is a neurodegenerative disorder affecting upper and lower motor neurons in primary motor cortex, brainstem and spinal cord. We present a case of a 24-year-old young male who presented with progressive quadriparesis and bulbar palsy with MRI brain revealing characteristic hyperintensities of the corticospinal tracts bilaterally, extending from the internal capsule to the brainstem, producing a 'wine glass' appearance on coronal sections.

Keywords: Amyotrophic lateral sclerosis, corticospinal tracts, wine glass

Amyotrophic lateral sclerosis (ALS) is a form of motor neuron disease (MND) characterized by the degeneration of upper and lower motor neurons. The mean age of onset is 57 years. Juvenile ALS is reserved for patients 25 years of age or less and is characterized by a prolonged survival. The degeneration of corticospinal tracts in the brain leads to the development of hyperintensities along the tracts extending from internal capsule to brainstem, producing a 'wine glass' appearance on magnetic resonance imaging (MRI). Thus, MRI brain can be a modality to provide an early evidence of corticospinal tract degeneration in MNDs.

CASE REPORT

A 24-year-old male presented with history of subacute onset weakness of all four limbs for last 1 year starting with left lower limb, manifesting as difficulty in clearing off foot from ground. This was followed by a similar involvement of right foot after 4-5 months. There was difficulty in gripping objects along with thinning of muscles and guttering noted between the thumb and the first dorsal interosseous. The patient started experiencing difficulty in swallowing, nasal regurgitation of fluids along with nasal twang to his voice. There was no associated sensory complaint, bowel or bladder involvement.

On examination, the vitals were normal. On neurological examination, jaw jerk was brisk. There was wasting of posterior fibers of deltoid, both anterior compartments of forearms bilaterally, interossei, chiefly the first dorsal interosseous and calf muscles. Generalized spasticity was present. The muscle power was MRC Grade 3/5 and 4/5 in the right and left upper limbs, respectively, and 3/5 in lower limbs bilaterally. Deep tendon reflexes were exaggerated and bilateral Babinski's sign was present. Sensory and cerebellar examination was unremarkable. The patient was subjected to neurophysiological studies, with electromyography revealing neurogenic affection with multiple fasciculations. MRI of the brain revealed linear, bilaterally symmetrical hyperintensities (Figs. 1-3) involving the corticospinal tracts in internal capsule, crus cerebri and pons on T2 weighted image (T2WI), giving a 'wine glass' appearance, seen in the coronal plane (Fig. 4).

DISCUSSION

Amyotrophic lateral sclerosis is a neurodegenerative disease characterized by involvement of both upper and lower motor neurons and is diagnosed by using revised El Escorial criteria. Thus, ALS has been conventionally diagnosed on the basis of clinical and electromyographic data. Motor neurons undergo degeneration and result in axonal edema apparent on electron microscopy. The degeneration of motor neurons may result in cellular loss and axonal edema.

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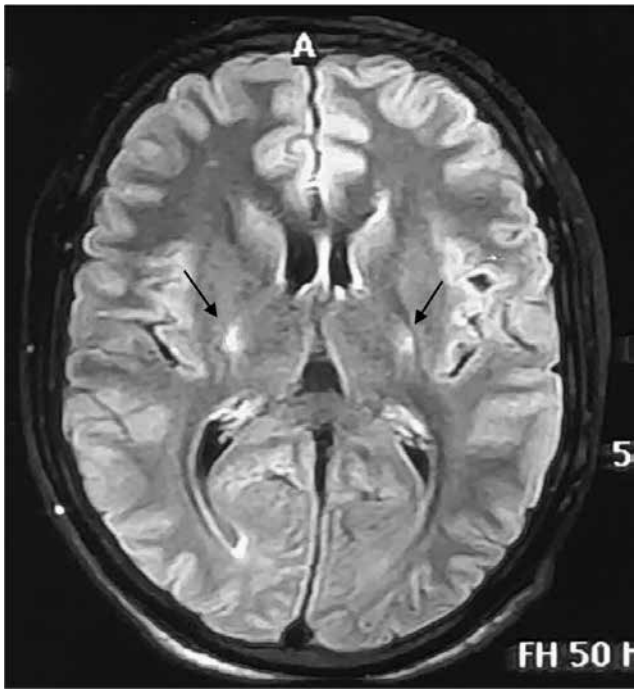

Figure 1. MRI brain axial section showing bilaterally symmetrical hyperintensities involving the corticospinal tracts in internal capsule.

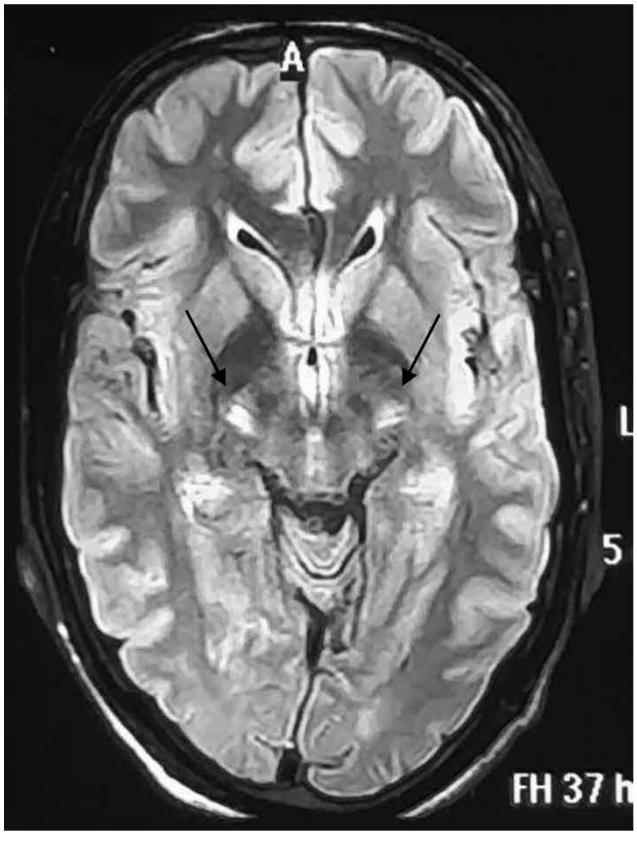

Figure 2. MRI brain axial section showing bilaterally symmetrical hyperintensities involving the corticospinal tracts in crus cerebri.

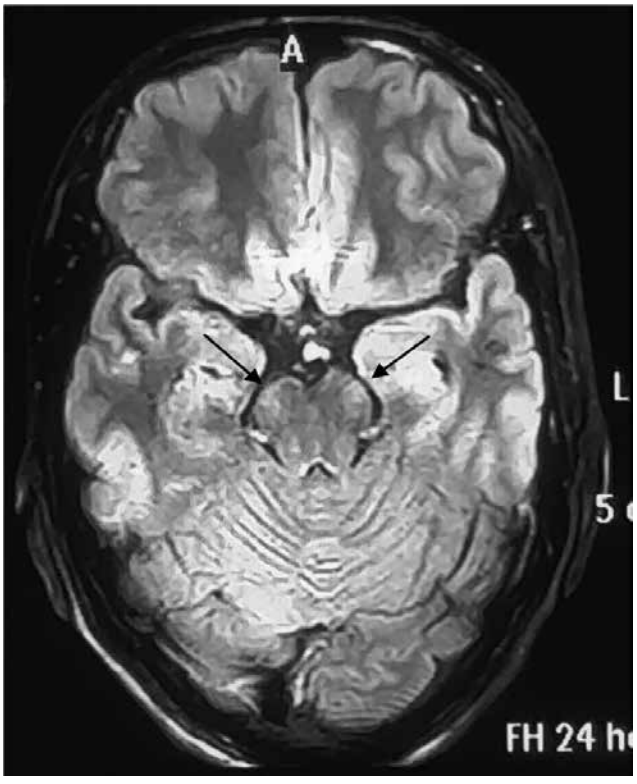

Figure 3. MRI brain axial section showing bilaterally symmetrical hyperintensities involving the corticospinal tracts in pons.

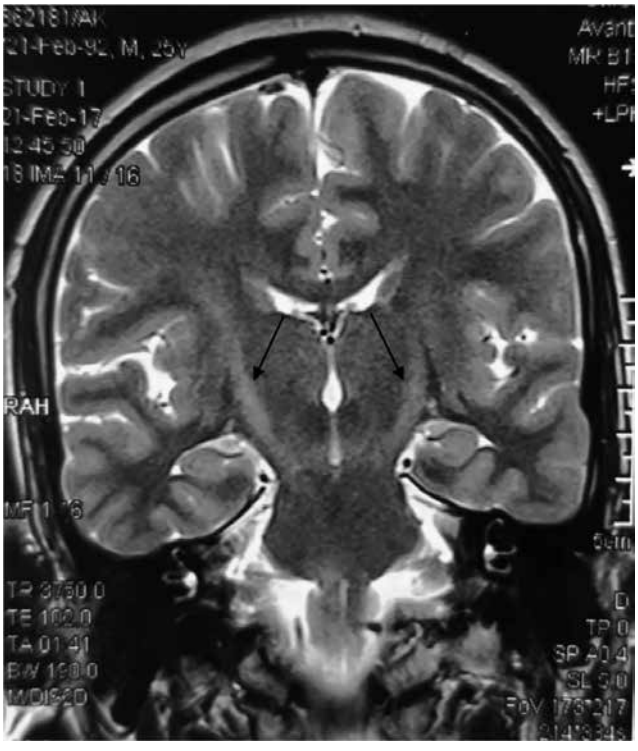

Figure 4. MRI brain coronal section showing bilaterally symmetrical hyperintensities involving the corticospinal tracts giving a 'wine glass' appearance.

About 90% of ALS cases are sporadic and 10% familial, with majority of the cases of juvenile ALS being familial. Juvenile ALS is inherited as autosomal recessive in majority, mapped to chromosome regions 2q33 and 15q12-21. Some are autosomal dominant, mapped to chromosome 9q34. Neuroimaging, till date, has been of limited use in diagnosing juvenile ALS. Kumar et al, in their case report, found the typical 'wine glass' appearance in a 9-year-old male presenting with both upper motor neuron (UMN) and lower motor neuron (LMN) features. Midani et al showed bilateral hyperintensities along the corticospinal tracts on T2WI MRI in a patient with juvenile ALS. There have been several studies on adult patients of MND showing MRI changes. But juvenile ALS, being a rare entity, doesn't have much literature on its MRI changes. In this case report, we suggest that the involvement of corticospinal tracts results in a typical 'wine glass' pattern in coronal section of brain MRI and thus, has a diagnostic utility in these cases.

CONCLUSION

Juvenile ALS can be suspected in children with both UMN and LMN features. MRI brain can provide an early clue to the diagnosis and prognostication of this disease.

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Types and Classification of Nerve Injury: A Review

R JAYASRI KRUPAA*, KMK MASTHAN†, ARAVINTHA BABU N‡, SONA B#

ABSTRACT

Nerve injuries are the most common conditions with varying symptoms, depending on the severity, intensity and nerves involved. Though much information is available on the mechanisms of injury and regeneration, reliable treatments that ensure full functional recovery are limited. The type of nerve injury alters the treatment and prognosis. This review article aims to summarize the various types of nerve injuries and their classification.

Keywords: Axonotmesis, neurotmesis, neurapraxia, Wallerian degeneration

Nerve injuries are the most common conditions with varying symptoms depending on the severity, intensity and nerves involved. Recovery after any nerve injury is variable. Though much information exists on the mechanisms of injury and regeneration, reliable treatments that ensure full functional recovery are limited. The type of nerve injury alters the treatment and prognosis. This review article aims to summarize the various types of nerve injuries and classification of nerve injuries, which is useful in understanding their pathological basis, and to evaluate the prognosis for recovery.

Understanding the basic nerve anatomy is important for the classification and also essential to evaluate the clinical prognostic value. In the central nervous system (CNS) and peripheral nervous system (PNS), there are three connective tissue layers:

- *Endoneurium:* Individual nerve fibers (single axons) are covered with varying amounts of myelin and then covered by endoneurium.
- *Perineurium:* These individually wrapped nerve fibers (endoneurium) are then grouped into bundles of fibers called fascicles, which are covered by perineurium.
- *Epineurium:* Finally, groups of fascicles are bundled together to form the peripheral nerve (such as the median nerve), which is covered by epineurium.

CLASSIFICATION

Classification by Type of Nerve Injury

There are three types of nerve injuries:

Nerve section

Nerve section can be partial or complete, sharp or blunt. They are often caused by sharp wounds by glass, firearms or knives.

Nerve strecthing

Stretching can occur in association with displaced fractures. During traction, the perineurium is elongated, the axons and epineurium stretch and tear.

Nerve compression

Compression can either be extrinsic or intrinsic. Extrinsic is more common in median nerve injury in the carpal tunnel and ulnar nerve at the elbow. Intrinsic compression is usually caused by the nerve tumor.

There are two mechanisms of peripheral nerve injury resulting from compression:

- *Indirect mechanism:* Acute or repeated prolonged compression may cause vascular stasis with increased vascular permeability and formation of endoneurial edema.
- *Direct mechanism:* A direct mechanical damage to the myelin sheath or the axon itself, thus restricting nerve conduction.

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Anatomical Nerve Injury

There are 2 main types of nerve injuries based on the part involved and classified based on correlation with the electromyography (EMG) finding:

- Seddon's classification
- Sunderland's classification.

Seddon's classification

Seddon provided a basis for assessment, prognosis and management of nerve injury. He classified nerve injuries into three categories - neurapraxia, axonotmesis and neurotmesis.

Neurapraxia

It is the least severe nerve injury, caused by transient compression or stretch. Conduction block results in loss of nerve function. Paralysis of muscles innervated by the nerve is complete. This type of injury will recover completely provided the cause, for example, ongoing compression, is removed. Recovery will take hours to months (average 6-8 weeks).

Axonotmesis

This is an anatomical interruption of the axon with no or only partial interruption of the connective tissue (endoneurium, perineurium and epineurium). This type of nerve injury requires regeneration of about 1.5-3 mm/day of the axon to the target muscle which is inhibited by scar formation. Wallerian degeneration occurs due to loss of axoplasmic flow. Patients with axonotmesis will require surgical treatment depending on the number of axons disrupted and the extent of scar formation at the site of nerve injury. Axons grow in adults at about 1 inch per month, and the recovery may take weeks to months. In infants, the axon may regenerate more rapidly, and the distance to be covered is much less. When a muscle loses its innervation, the nerve receptors will disappear over a period of 1-2 years. This may require neurosurgical intervention because a repair regenerated too late will not have receptors in the muscles for the regeneration of nerves.

Neurotmesis

Here, the nerve is completely disrupted or badly disorganized. This is the most severe form of nerve injury. Along with axons, all the connective tissue layers of the nerve are disrupted. There is axon degeneration distal to the injury. Neurotmesis may be caused by laceration or high energy traction injuries. Ischemia or injection of noxious drugs can also cause nerve injury. Recovery can only occur after appropriate surgical repair of the nerve and relies on axonal regeneration. Mixing and disruption of fibers at the site of the repair result in failure of correct distal connections. So, the recovery is either imperfect or incomplete.

Limitations of Seddon's classification

All grades of intraneural damage are not distinguished with Seddon's classification. Lesions classified as axonotmesis have been observed to have variable recovery. This could occur because variable degrees of damage to the connective tissue layers of the nerve, including the endoneurium and perineurium and disruption of axons are possible without loss of continuity of the nerve trunk.

Sunderland's classification

Sunderland, in 1951, described 5 degrees of nerve injury based on the disruption of the nerve and their continuity with the connective tissue. Mackinnon and Dellon added a 6th degree injury to Sunderland's classification where there was variable degrees of nerve injury.

- 1st degree - conduction block (neurapraxia).
- 2nd degree - axonal injury (axonotmesis).
- 3rd degree - axonal injury with endoneurium injury.
- 4th degree - axonal injury with endoneurium injury and perineurium injury.
- 5th degree - axonal injury with endoneurium injury, perineurium injury and neurapraxia.
- 6th degree - combination of previous injuries.

Table 1 summarizes the correlation between Sunderland and Seddon classifications and intact connective tissue.

DISCUSSION

If there is a trauma and signs of a nerve injury then surgery will be necessary to look at the nerve and if there, whether it has been partly or completely disrupted. If there is no wound, then it is likely that a "wait and watch" policy will be adopted. Under these circumstances, further investigations may be carried out to try and assess the damage to the nerve. There are various investigation methods to diagnose the degree of nerve injury; this is done using neurophysiology testing where the nerves are stimulated with an electric current and the speed at which the nerve conducts is measured (electromyography). Neurophysiology tests can distinguish between injuries where axons have not degenerated (neurapraxia) and those where axons have degenerated distally (axonotmesis and

Table 1. Correlation Between Sunderland and Seddon Classifications and Intact Connective Tissue

Sunderland's	Seddon's	Axon	Endoneurium	Perineurium	Epineurium	Fibrillation potential on EMG	Clinical sign	Recovery
1st degree	Neurapraxia	+	+	+	+	Absent	Paresthesia, partial or total palsy	Full (1 day to 3 months)
2nd degree	Axonotmesis	–	+	+	+	Present	Paresthesia, partial or total palsy	Generally full (1-6 months)
3rd degree	Axonotmesis	–	–	+	+	Present	Paresthesia, dysesthesia, partial or total palsy	Partial (12-24 months)
4th degree	Axonotmesis	–	–	–	+	Present	Hypoesthesia, dysesthesia, total palsy	None without repair
5th degree	Neurotmesis	–	–	–	–	Present	Anesthesia, total palsy	None without repair
6th degree	Combination of prevoius injury	–	–	–	–	Present	Paresthesia, partial or total palsy	None without repair

'+' = Intact nerve; '–' = Injured nerve (not intact).

neurotmesis). If axonotmesis has affected all the fibers in a nerve, then the findings will be indistinguishable neurotmesis. However, in mixed lesion, with some fibers intact, detection of these will imply that there is no disruption of the nerve trunk. In addition, very fine needles may be inserted into an affected muscle and recordings made of the activity in that muscle. Normal nerves can be visualized on magnetic resonance imaging (MRI), although their signal characteristics are not distinct from other tissues. A technique called magnetic resonance neurography, which enhances neural tissue on images, was reported by Filler. Modern ultrasound scanners have improved to the extent that resolution is now greater than MRI. Ultrasound is being used increasingly to examine nerves damaged by closed trauma. These will help to grade the level of injury and can help in treatment planning and giving information on the potential outcome of the injury.

CONCLUSION

The result of a nerve injury depends on many variables, as detailed in this article. The important thing to remember is that nerves take many months to years to repair and recovery. The final result may not be known for 2 years or more. The purpose of this article is to outline the main types, classification and correlating the nerve injuries to evaluate their clinical value and to improve the prognosis of nerve recovery.

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Every citizen of India should have the right to accessible, affordable, quality and safe heart care irrespective of his/her economical background

HEART CARE FOUNDATION OF INDIA
A Not-For-Profit Organisation

Sameer Malik Heart Care Foundation Fund

An Initiative of Heart Care Foundation of India

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"No one should die of heart disease just because he/she cannot afford it"

About Sameer Malik Heart Care Foundation Fund

"Sameer Malik Heart Care Foundation Fund" it is an initiative of the Heart Care Foundation of India created with an objective to cater to the heart care needs of people.

Objectives

- Assist heart patients belonging to economically weaker sections of the society in getting affordable and quality treatment.
- Raise awareness about the fundamental right of individuals to medical treatment irrespective of their religion or economical background.
- Sensitize the central and state government about the need for a National Cardiovascular Disease Control Program.
- Encourage and involve key stakeholders such as other NGOs, private institutions and individual to help reduce the number of deaths due to heart disease in the country.
- To promote heart care research in India.
- To promote and train hands-only CPR.

Activities of the Fund

Financial Assistance

Financial assistance is given to eligible non emergent heart patients. Apart from its own resources, the fund raises money through donations, aid from individuals, organizations, professional bodies, associations and other philanthropic organizations, etc.

After the sanction of grant, the fund members facilitate the patient in getting his/her heart intervention done at state of art heart hospitals in Delhi NCR like Medanta – The Medicity, National Heart Institute, All India Institute of Medical Sciences (AIIMS), RML Hospital, GB Pant Hospital, Jaipur Golden Hospital, etc. The money is transferred directly to the concerned hospital where surgery is to be done.

Drug Subsidy

The HCFI Fund has tied up with Helpline Pharmacy in Delhi to facilitate patients with medicines at highly discounted rates (up to 50%) post surgery.

The HCFI Fund has also tied up for providing up to 50% discount on imaging (CT, MR, CT angiography, etc.)

Who is Eligible?

All heart patients who need pacemakers, valve replacement, bypass surgery, surgery for congenital heart diseases, etc. are eligible to apply for assistance from the Fund. The Application form can be downloaded from the website of the Fund. http://heartcarefoundationfund.heartcarefoundation.org and submitted in the HCFI Fund office.

Important Notes

- The patient must be a citizen of India with valid Voter ID Card/ Aadhaar Card/Driving License.
- The patient must be needy and underprivileged, to be assessed by Fund Committee.
- The HCFI Fund reserves the right to accept/reject any application for financial assistance without assigning any reasons thereof.
- The review of applications may take 4-6 weeks.
- All applications are judged on merit by a Medical Advisory Board who meet every Tuesday and decide on the acceptance/rejection of applications.
- The HCFI Fund is not responsible for failure of treatment/death of patient during or after the treatment has been rendered to the patient at designated hospitals.
- The HCFI Fund reserves the right to advise/direct the beneficiary to the designated hospital for the treatment.
- The financial assistance granted will be given directly to the treating hospital/medical center.
- The HCFI Fund has the right to print/publish/webcast/web post details of the patient including photos, and other details. (Under taking needs to be given to the HCFI Fund to publish the medical details so that more people can be benefitted).
- The HCFI Fund does not provide assistance for any emergent heart interventions.

Check List of Documents to be Submitted with Application Form

- Passport size photo of the patient and the family
- A copy of medical records
- Identity proof with proof of residence
- Income proof (preferably given by SDM)
- BPL Card (If Card holder)
- Details of financial assistance taken/applied from other sources (Prime Minister's Relief Fund, National Illness Assistance Fund Ministry of Health Govt of India, Rotary Relief Fund, Delhi Arogya Kosh, Delhi Arogya Nidhi), etc., if anyone.

Free Diagnostic Facility

The Fund has installed the latest State-of-the-Art 3 D Color Doppler EPIQ 7C Philips at E – 219, Greater Kailash, Part 1, New Delhi.
This machine is used to screen children and adult patients for any heart disease.

Free Education and Employment Facility

HCFI has tied up with a leading educational institution and an export house in Delhi NCR to adopt and to provide free education and employment opportunities to needy heart patients post surgery. Girls and women will be preferred.

Laboratory Subsidy

HCFI has also tied up with leading laboratories in Delhi to give up to 50% discounts on all pathological lab tests.

Help Us to Save Lives

The Foundation seeks support, donations and contributions from individuals, organizations and establishments both private and governmental in its endeavor to reduce the number of deaths due to heart disease in the country. All donations made towards the Heart Care Foundation Fund are exempted from tax under Section 80 G of the IT Act (1961) within India. The Fund is also eligible for overseas donations under FCRA Registration (Reg. No 231650979). The objectives and activities of the trust are charitable within the meaning of 2 (15) of the IT Act 1961.

Donate Now...

About Heart Care Foundation of India

Heart Care Foundation of India was founded in 1986 as a National Charitable Trust with the basic objective of creating awareness about all aspects of health for people from all walks of life incorporating all pathies using low-cost infotainment modules under one roof.

HCFI is the only NGO in the country on whose community-based health awareness events, the Government of India has released two commemorative national stamps (Rs 1 in 1991 on Run For The Heart and Rs 6.50 in 1993 on Heart Care Festival- First Perfect Health Mela). In February 2012, Government of Rajasthan also released one Cancellation stamp for organizing the first mega health camp at Ajmer.

Objectives

- Preventive Health Care Education
- Perfect Health Mela
- Providing Financial Support for Heart Care Interventions
- Reversal of Sudden Cardiac Death Through CPR-10 Training Workshops
- Research in Heart Care

Heart Care Foundation Blood Donation Camps

The Heart Care Foundation organizes regular blood donation camps. The blood collected is used for patients undergoing heart surgeries in various institutions across Delhi.

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This Fund is dedicated to the memory of **Sameer Malik** who was an unfortunate victim of sudden cardiac death at a young age.

- HCFI has associated with Shree Cement Ltd. for newspaper and outdoor publicity campaign
- HCFI also provides Free ambulance services for adopted heart patients
- HCFI has also tied up with Manav Ashray to provide free/highly subsidized accommodation to heart patients & their families visiting Delhi for treatment.

http://heartcarefoundationfund.heartcarefoundation.org

Evaluation of Perinatal Outcome by Antenatal CTG and Umbilical Artery Doppler in Pre-eclamptic Mothers

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ABSTRACT

This was a well-controlled hospital-based longitudinal prospective randomized study with sole focus on pre-eclampsia cases, where cardiotocography (CTG) and colored Doppler were the two special investigative tools applied to examine the perinatal outcome. The study concluded with a note that antenatal CTG is a useful objective test to know the intrauterine fetal status but it cannot forecast the fetal behavior during labor, neither does it provide a guide to optimize the timing of induction of labor (IOL) or termination by cesarean section. Color Doppler indices done after 34 weeks definitely give a qualitative assessment of fetoplacental perfusion but they cannot predict the said perfusion during labor - when there occurs a degree of compromise with the uterus contracting repetitively. Ultrasonography (USG) for fetal biometry and liquor volume is a good test to determine small for gestational age or intrauterine growth restriction (IUGR), as the case may be, taking cognizance of other factors e.g., pre-eclampsia, fetal congenital anomaly, etc. Every mother with pre-eclampsia needs to be evaluated clinically, biochemically and ultrasonologically. Understanding the limitation of antenatal CTG and color Doppler indices, these should be applied in a few selected cases e.g., increased fetal movement, IUGR, which is reassuring to both the patient and the doctor who can wait till a reasonable degree of fetal maturity occurs before one goes for IOL or a cesarean section. Patients with a suspicious CTG should undergo continuous CTG during labor; otherwise there is always a tendency to go for an early lower-segment cesarean section (LSCS). For a pre-eclamptic mother with a pathological CTG the decision is an elective LSCS; whereas, in cases with pathological CTG but normal Doppler indices, the judgment is too difficult. The answer then would depend on factors like whether the pre-eclampsia is controlled and whether the biochemical and hematological parameters are within normal limits. Of course, thanks to the presence of a special newborn care unit (SNCU) nearby.

Keywords: CTG, Doppler, pre-eclampsia

INTRODUCTION, REVIEW OF LITERATURE AND OBJECTIVES

Pre-eclampsia is a multisystem, highly variable disorder, unique to pregnancy and a leading cause of maternal and perinatal mortality and morbidity. It is a syndrome defined by hypertension and proteinuria that also may be associated with a myriad of other signs and symptoms such as edema, visual disturbances, headache and epigastric pain. The increased incidence of perinatal morbidity and mortality seen in pregnancies complicated by pre-eclampsia is primarily due to the need for premature delivery and uteroplacental insufficiency resulting in a compromised blood flow to the fetus. The primary adoptive response of the fetus to placental insufficiency is a decrease in growth. Persistent placental insufficiency will result in decreased fetal movement to conserve energy, hemodynamic redistribution to favor the oxygenation of organs critical to the economy such as the brain, heart, suprarenal and attempt to improve the efficiency of the placental gas exchange by increasing the heart rate and the synthesis of red cells. Progressive decompensation like this will lead to a metabolic and respiratory acidosis,

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increased impedance to fetoplacental circulation, renal insufficiency with decreased amniotic fluid volume, myocardial compromise, absent or reversed atrial flow in ductus venosus, late deceleration in the fetal heart rate (FHR) tracing and fetal death. It would be ideal that this sequence of pathological changes elicited by placental insufficiency and fetal hypoxia could be identified in each of its different stages by a single test, which has not been achieved so far.

In an attempt to stratify risk, a variety of antepartum screening tests are performed, which include few laboratory tests and sonographic assessments, besides history taking and clinical examination, including serial symphysiofundal height measurement. Antenatal cardiotocography (CTG) is a special test for evaluation of fetal status. Prof. Essar GS Dows and Prof. C Redman of United Kingdom were two pioneers in the eighties who devised the computer program to evaluate CTG. The basic objective of CTG is to assess co-ordination between fetal central nervous system (CNS) and the cardiovascular system based on the fact that a well-oxygenated healthy fetus with functionally intact CNS-cardiac axis will show accelerations (rise of FHR 15 beats/minutes for 15 seconds above baseline) with fetal movements - the so called reactive CTG. In addition, good FHR variability (≥5 bpm) suggests normal balance of sympathetic-parasympathetic activity, an indirect evidence of adequate oxygenation of fetal regulatory centers. Indeed, a normal FHR variability is the hallmark of fetal well-being. Accepted normal parameters for term fetus are:

- Baseline FHR 110-160 beats/minute
- Baseline variability should be > 5 beats/minute
- Presence of two or more accelerations of FHR exceeding 15 beats/minute, sustained for at least 15 seconds in a 20-minute period. This pattern is termed as 'Reactive.'
- Absence of deceleration.

However, a Cochrane meta-analysis of randomized controlled trials (RCTs) involving 1,558 high/intermediate risk pregnancies suggested that antepartum CTG alone has no significant impact on perinatal outcome. Though, initial studies have shown a strong correlation between abnormal CTG and poor perinatal outcome, when CTG is used alone, significant interobserver variations, poor specificity and high false-positive rates causing increased number of lower-segment cesarean section (LSCS) are other problems. The change in behavior of ultrasound waveform reflecting from a moving object - the Doppler effect - was introduced in the assessment of umbilical artery flow at Dubling in 1977. Longitudinal Doppler studies of the umbilical artery show that the systolic/diastolic (S/D) ratio decreases as gestation progresses. This is an indirect evidence of decreasing placental resistance with advancing gestation. However, there is no definite agreement as to what constitutes an abnormal Doppler study. Most authors have accepted an S/D ratio >3.0 as the cut-off beyond 30 weeks gestation. Gradual increase in umbilical artery resistance leads to absent and subsequently reversed end-diastolic flow, which is associated with progressively worse perinatal outcome. The Doppler indices are calculated as ratios between peak systolic velocity (A), end-diastolic peak velocity (B) and mean velocity (mean). The indices most common in clinical practice, are pulsatility index (PI) = (A-B)/mean, and resistant index (RI) = (A-B)/A. With normal placental perfusion, the umbilical artery waveform has a pattern compatible with a low-resistance system, showing forward blood flow throughout the cardiac cycle. Inadequate placental perfusion causes progressive changes in the Doppler flow pattern of umbilical artery starting from absent or reversed end-diastolic flow, increase in resistance index, which correlate well with fetal acidosis. The first meta-analysis of umbilical artery Doppler in high-risk pregnancies published in 1995 demonstrated significant reduction in perinatal death.

Two large RCTs- one from South Africa and other from Canada, and one Cochrane review of routine Doppler studies of umbilical artery in high-risk pregnancies have shown conflicting reports of benefit regarding perinatal outcome. However, evidence from small RCTs does indicate less requirement of emergency cesarean section for fetal distress if Doppler velocity was used (NICE Guideline, 2010). The TRUFFLE study was designed to compare reduced short-term variations on CTG and Doppler velocimetry of ductus venosus to determine optimum timing of delivery of growth restricted fetus.

In this study, spanning 6 months, we tried to evaluate perinatal outcome in pre-eclampsia in terms of mode of delivery (vaginal/instrumental/LSCS), need for induction of labor (IOL), neonatal status according to specific parameters by means of antenatal CTG and umbilical artery Doppler in late third trimester at our institution, which is a tertiary maternity care center with an annual delivery rate of >20,000, delivering optimal care free of cost to a large population from three districts namely Bankura, Purulia and Paschim Medinipur in West Bengal. Our objective was to ascertain an optimum and cost-effective way

to treat pre-eclamptic mothers and to obviate special investigations like CTG and umbilical artery Doppler in each and every case and thereby save some cost as well as manpower.

MATERIAL AND METHODS

This was a prospective longitudinal study carried out in our department during 6 months. All pre-eclamptic mothers of >34 weeks of gestation with a single intrauterine fetus with cephalic presentation without any congenital anomaly were included in the study. Patients with prelabor rupture of membrane, antepartum hemorrhage (APH), bad obstetric history, elderly primi (>35 years), multifetal pregnancy, malpresentation, history of systemic illness e.g., antiphospholipid syndrome, chronic renal disease, heart diseases, psychiatric illness were excluded.

Known cases of pre-eclampsia were evaluated with history, examination and laboratory investigations including urine albumin, serum uric acid, platelet count, clotting time, renal and liver function tests. The cases were then randomized and allocated in the study group and control group. The study group had undergone an antenatal CTG for 40 minutes and umbilical artery Doppler study. Categorization of FHR traces was done following Royal College of Obstetricians and Gynaecologists (RCOG) criteria 2001 as normal, suspicious and pathological. Normal implied fetal well-being and as such a conservative approach; whereas, suspicious implied continued observation and additional test e.g., vibroacoustic stimulation (VAS) and pathological indicated an urgent delivery.

The study group had also undergone assessment of fetoplacental profile and a Doppler assessment of umbilical artery. S/D ≤3 and RI ≤0.6 were considered normal; raised indices, absent or reversed end-diastolic flows were taken as signs of fetal distress. The decision to deliver the baby at an optimum time through an appropriate route (vaginal/LSCS) was taken considering the gestational age and the results of CTG and umbilical artery Doppler indices.

The control group was followed up by daily clinical monitoring and routine USG for fetoplacental profile and liquor volume. They were delivered by appropriate route at an optimum gestational age according to these findings and consultant decision.

Study group, where a conservative approach was followed till maturity (37 weeks), were followed up twice in a week by CTG and another Doppler study after 2 weeks. Control group, in similar situation, had another routine USG for FPP after 2 weeks. The neonatal outcomes of both groups were recorded in predesigned proforma and compared using Chi-square test and Student's *t*-test and statistical software Medcalc 12.3.0. Ethical clearance was obtained from College Ethical Committee and due consent was taken from patients and their husbands or a near relative.

OBSERVATION AND DISCUSSION

Two-third of our study population (n = 35) had a reactive CTG and one-third showed a nonreactive type (Table 1). Nearly, 92% patients of reactive CTG against 45% of those with nonreactive type had a normal delivery and 54% with nonreactive CTG had a cesarean delivery against only 4% of reactive type – the difference of picture is definitely significant ($p < 0.05$). Random application of CTG has increased the number of LSCS whenever CTG tracing gets abnormal has been supported by other authors in the past: Khursheed et al showed a 72% LSCS rate when CTG was of pathological pattern.

Overall, the incidence of vaginal delivery (normal and instrumental) among the study group was 80% (28 out of 35) and LSCS was 20%. In a tertiary care center, 20% LSCS rate among pre-eclampsia cases was quite acceptable against World Health Organization (WHO) standard of 15%. So, CTG in this study has favored decision towards cesarean section but it has not pushed the number to an unacceptably high rate, which needed an audit. The message here is that CTG in pre-eclampsia is a useful investigation that allows judicious decision making and does not cause unnecessary panic among obstetricians to take hasty decisions of LSCS which is obvious from the fact that 45% (5 out of 11) of nonreactive CTG cases were allowed a normal delivery. Though, a significantly higher incidence ($p = 0.003$) of low Apgar score was noted among nonreactive CTG, there was no perinatal death. Similar findings of increased neonatal hypoxia were noted by Chew et al in 2009. So, CTG can predict a low Apgar neonate but not enough to predict a perinatal death.

More than two-third (25 out of 35) of the study group had high umbilical artery Doppler indices (Table 2) but incidence of LSCS was not significantly higher ($p = 0.24$). However, among the neonates, the low Apgar score was significantly associated with raised Doppler indices, 52% against 10% ($p = 0.01$):

Table 1. No. of Patient Showing Reactive or Nonreactive CTG in the Study Population

CTG	Mode of delivery			Apgar score at 1 min	
	Normal	LSCS	Forceps	≥7	<7
Reactive (n = 24)	22 (91.6%)	1 (4.2%)	1	18 (75%)	6 (25%)
Nonreactive (n = 11)	5 (45.5%)	6 (54.5%)	-	3 (27.3%)	8 (72.8%)
Total (n = 35)	**27 (77.14%)**	**7 (20%)**	**1**	**21 (60%)**	**14 (40%)**
		P = 0.002		P = 0.003	

Table 2. Umbilical Artery Doppler Indices of the Study Population

Umbilical artery Doppler indices	Mode of delivery			Apgar score at 1 min	
	Normal	LSCS	Forceps	≥7	<7
Normal (n = 10)	8 (80%)	1 (10%)	1	9 (90%)	1 (10%)
Raised (n = 25)	19 (76%)	6 (24%)	-	12 (48%)	13 (52%)
Total (n = 35)	**27 (77.14%)**	**7 (20%)**	**1**	**21 (60%)**	**14 (40%)**
	P = 0.2004			P = 0.01	

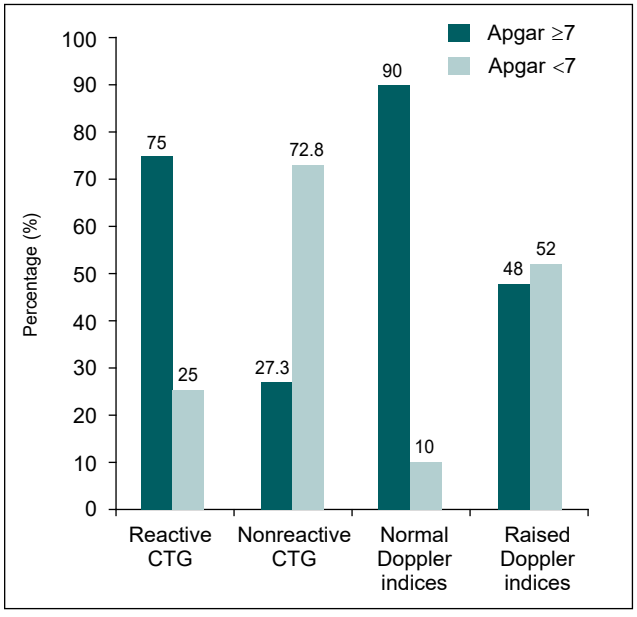


Figure 1. Association of low Apgar score with raised Doppler indices.

(Fig. 1). This finding validates the fact that umbilical artery Doppler shows the extent of fetoplacental perfusion during fetal diastole and is a recognized tool to show intrauterine fetal status. Sharma et al got almost similar findings in their study in 2010.

The mean gestational age at birth of the study group and control group were not statistically different (p = 0.792). The labor events; the incidence of IOL versus spontaneous onset labor, incidence of vaginal delivery versus LSCS; Apgar score at 1 minute and 5 minutes; mean neonatal birth weight, number of hypoxic neonates requiring Bag Mask (BM) resuscitation and special newborn care unit (SNCU) admission when compared vis-a-vis with the control group had shown quite similar results with p value ranging from 0.125 to 0.816 (Table 3). A range of well-defined studies including one evidence-based meta-analysis from 1992 to 2001 could find no significant difference in neonatal outcome and LSCS rate with Doppler velocimetry. In 2010, Alfirevic et al in a Cochrane review on "Fetal and umbilical Doppler ultrasound in high-risk pregnancies" could not identify a difference in the requirement of intubation and assisted ventilation among neonates between Doppler velocimetry group and control group without Doppler velocimetry. Figure 2 shows CTG findings of the study population.

CONCLUSION

Therefore, universal application of antenatal CTG and umbilical artery Doppler does not do anything better than a routine USG among mature fetuses to forecast perinatal outcome. It is the labor monitoring and 24 hours cesarean section facility that matters when emergency arises in the form of prolonged labor, meconium staining and fetal bradycardia. Over the years, scientists have explored this area to determine the postnatal events with antenatal CTG and Doppler, which has remained a grey area even today because beyond 34-36 weeks of gestation, it is uncommon to find absent or reversed EDF in the umbilical arteries caused by uteroplacental insufficiency. Abnormal umbilical artery Doppler after 35 weeks should prompt consideration of other causes, especially aneuploidy (Trisomies 18, 21).

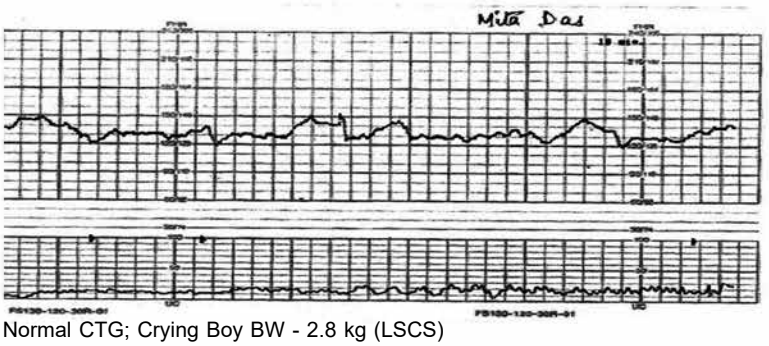
Table 3. Perinatal Outcome in the Study and Control Group

Parameters	Study group	Control group	P value
Gestational age at birth (weeks)			
Mean; SD	38.6, 1.77	38.92, 1.88	*t*-test
34-37	2	6	p = 0.792
>37	33	29	
Labor events			
IOL	9	11	Chi-sq. *t*-test
SOL	26	24	p = 0.298
Mode of delivery			
ND	27	24	Chi-sq. *t*-test
LSCS	7	8	p = 0.537
Forceps	1	3	
Apgar score			
Mean; SD	6.51, 1.90	6.69, 1.683	Chi-sq. *t*-test
≥7 at 1 min	21	19	p = 0.147
<7 at 1 min	14	16	
Apgar score			
Mean, SD	7.46, 0.99	7.86, 1.29	Chi-sq. *t*-test
≥7 at 5 min	33	32	p = 0.125
<7 at 5 min	2	3	
Birth weight (g)			
Mean, SD	2691, 392	2670, 356	Chi-sq. *t*-test
1,500-2,500	6	11	p = 0.816
>2,500	29	24	
Need for resuscitation			
Yes with Bag Mask (BM)	14	16	Chi-sq. *t*-test
No	21	19	p = 0.404
SNCU admission			
Yes	7	9	Chi-sq. *t*-test
No	28	26	p = 0.285

IOL = Induction of labor; SOL = Spontaneous of labor; ND = Normal delivery; LSCS = Lower-segment cesarean section; SD = Standard deviation; SNCU = Special newborn care unit.

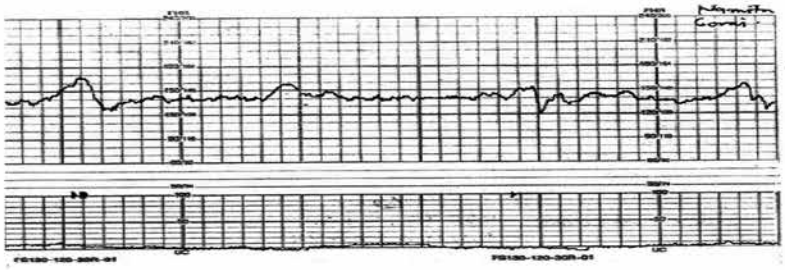
In absence of aneuploidy, assessment of intrauterine growth restriction (IUGR) in late pregnancy is challenging because umbilical artery Doppler has a limited value in this setting. The timing of delivery is contentious because a favorable perinatal outcome is expected even with early delivery once diagnosis of IUGR has been made by fetal ultrasound biometry, amniotic fluid index, umbilical and middle cerebral artery Doppler indices. Elective induction of labor with continuous FHR monitoring may result in successful vaginal delivery although fetal distress and meconium staining in labor are common complications.

The current study, though conducted on a small sample, can be considered as a pamphlet that speaks the need of careful clinical monitoring along with a routine USG after 34 weeks, thanks to the presence of SNCU attached to the maternity ward. Control of blood pressure by labetalol or nifedipine (both the drugs are freely available at our ward); sending blood samples for Hb%, hematocrit, platelet count, serum urate, liver enzymes and 24 hours urine for protein; with or without the presence of IUGR on USG provide valuable clue to choose between immediate delivery by LSCS, IOL followed by fetal monitoring and trial of labor for at least six hours and/or prophylactic MgSO4 injection followed by emergency LSCS.



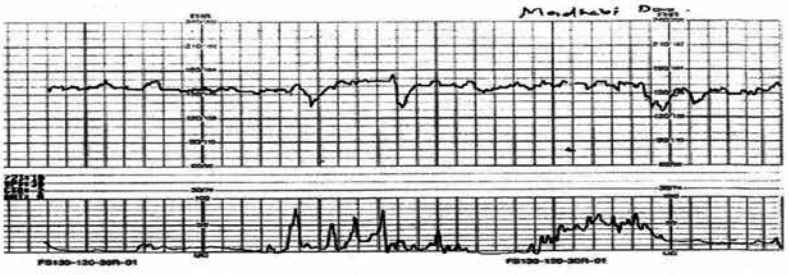
Baseline FHR 130 bpm
Variability >5
4 accelerations
No deceleration

Normal CTG; Crying Boy BW - 2.8 kg (LSCS)



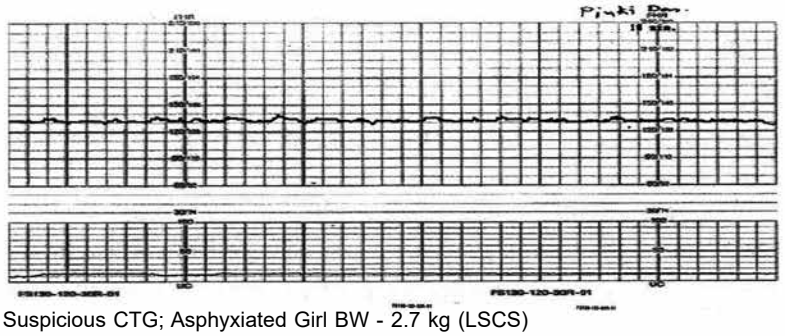
Baseline FHR 140 bpm
Variability >5
3 accelerations
No deceleration

Normal CTG; Crying Girl BW - 2.8 kg (ND)



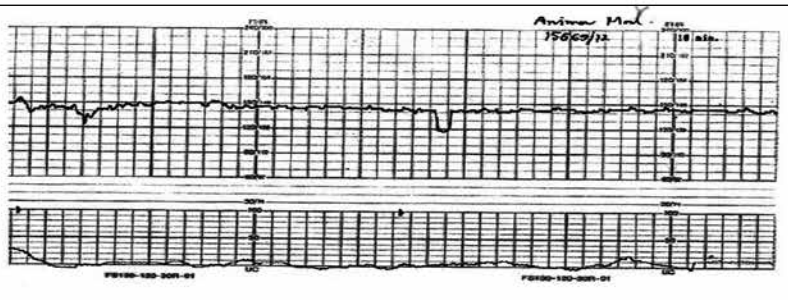
Baseline FHR 155 bpm
Variability >5
No acceleration
2 late decelerations

Suspicious CTG; Asphyxiated Boy BW - 1.75 kg (LSCS)



Baseline FHR 130 bpm
Variability <5
No acceleration
No deceleration

Suspicious CTG; Asphyxiated Girl BW - 2.7 kg (LSCS)



Baseline FHR 145 bpm
Variability >5
First 2 mts
<5 rest of tracing
No acceleration
1 deceleration

Pathological CTG; Asphyxiated Girl BW - 2.9 kg (LSCS)

Figure 2. CTG findings of the study population.

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■■■■

EMA Recommends Fenspiride Suspension Because of Heart Risks

EMA's safety committee (PRAC) has recommended an EU-wide suspension of fenspiride medicines, used in children and adults to relieve cough caused by lung diseases. The suspension is a precautionary measure to protect patients while the PRAC reviews the risk of QT prolongation and torsades de pointes (abnormalities of the heart's electrical activity that may lead to heart rhythm disturbances).

The USPSTF recommends that primary care providers screen women who have family members with breast, ovarian, tubal or peritoneal cancer or have an ethnicity or ancestry associated with BRCA1 or BRCA2 gene mutations with one of several screening tools designed to identify a family history that may be associated with an increased risk for potentially harmful mutations in breast cancer susceptibility genes (BRCA1 or BRCA2). Women with positive screening results should receive genetic counseling and, if indicated after counseling, genetic testing.

Allergic Rhinitis often precedes Asthma[1]

Effective treatment of Allergic Rhinitis may reduce Asthma progression[1]

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1. *Respir Res. 2005 Dec 28;6:153*

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A Comparative Study of Safety Profile and Efficacy of Acyclovir and Ganciclovir in Viral Corneal Ulcer

RAJENDER SINGH CHAUHAN*, ASHOK RATHI*, APARNA YADAV†, JP CHUGH*, RAVINDER ROSE‡

ABSTRACT

Objective: The present study was conducted to evaluate the safety profile and efficacy of ganciclovir in cases of viral corneal ulcer and to compare it with acyclovir. **Material and methods:** It was a randomized controlled comparative study undertaken at the Regional Institute of Ophthalmology, Pt BD Sharma PGIMS, Rohtak, Haryana. The patients were divided into two groups of 25 each. Group I received acyclovir 3% ointment and Group II received ganciclovir 0.5% gel. Patients were followed-up weekly for 1 month. Efficacy of the drug was assessed in terms of visual acuity and extent of healing. Safety profile was assessed by development of ocular irritation, blurring of vision and iatrogenic diffuse punctate keratopathy. The observations were analyzed using unpaired and paired 't' test and Chi-square test. **Results:** By 14th day, 80% ulcers were healed in Group I while 88% were healed in Group II. The best corrected visual acuity after healing was also similar in the two groups (p = 0.730). The safety profile in terms of ocular irritation, blurring of vision and punctate keratopathy of both the drugs was found to be similar. **Conclusion:** The efficacy and safety profile of both the drugs was similar in the treatment of viral corneal ulcer.

Keywords: Acyclovir, ganciclovir, corneal ulcer

Viral keratitis is a common cause of blindness in both developing and developed countries. Even though both DNA and RNA viruses are responsible for keratitis, common corneal infections are caused by DNA viruses, the commonest ones being the herpes group viruses (Type 1, 2, 3 - varicella zoster virus [VZV]) and adenoviruses.

Congenital ocular herpes is rare. Primary ocular herpes is the first infection of a nonimmune subject with microdendrites and lymphadenopathy. Recurrent ocular herpes gets reactivated from sensory ganglia with triggering factors.

Diagnosis is mainly clinical and treatment is mostly symptomatic and with antiviral and cycloplegic drugs. Globally, there are 1,000,000 new cases each year. According to herpetic eye disease study (HEDS), herpes simplex virus (HSV) epithelial keratitis accounted for 47% of ocular herpes cases.

Previously, topical acyclovir was compared with trifluorothymidine, vidarabine and idoxuridine and with interferon.

The topical antiviral agents used in the treatment of herpetic viral keratitis include acyclovir ophthalmic ointment 3%, ganciclovir ophthalmic gel 0.15% and trifluridine ophthalmic solution 1%. Various studies have been conducted to asses and compare the efficacy, safety and tolerability of the drugs. Some of these trials have shown that acyclovir and ganciclovir are equally effective.

This study was conducted to evaluate and compare the efficacy and safety profile of ganciclovir as compared to acyclovir in viral keratitis.

MATERIAL AND METHODS

A single-blinded randomized control trial was carried out at the Regional Institute of Ophthalmology, PGIMS, Rohtak, Haryana over a period of 1 year.

Cases of acute viral corneal ulcer were included in the study. Patients with superadded bacterial infection and those appearing immune-mediated clinically were

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excluded. Patients were divided into two groups. Group I received topical acyclovir ointment 3% while Group II received topical ganciclovir gel 0.15%. Randomization was done using computer generated randomization table.

The sample size was calculated using the formula:

$$n = \frac{2(p)(1-p)(Z_B+Z_a/2)^2}{(P_1-P_2)^2}$$

where n is sample size, p is the prevalence of viral keratitis taken as 1.6%, Z_B is the desired power, i.e., typically 0.84, $Z_{a/2}$ is the desired level of statistical significance, i.e., typically 1.96 and (P_1-P_2) is the effect size taken as 0.01.

The size of each group came out to be 25, so the total sample size taken was 50. Detailed history was taken and on follow-up visits, ocular irritation and blurring of vision were assessed subjectively as 0-none, 1-mild, 2-moderate and 3-severe. The best corrected visual acuity was noted.

Corneal scraping was examined with Giemsa staining for multinucleated giant cells. Gram stain and potassium mount were used to rule out bacterial and fungal etiology. Follow-up was done on Days 1, 7, 14 and 21. Outcome was assessed in terms of safety profile and efficacy.

Assessment of safety profile

- Ocular irritation due to drug instillation.
- Blurring of vision due to drug instillation.
- Punctate keratopathy.

Assessment of efficacy

- Best corrected visual acuity (BCVA) after treatment.
- Mean ulcer healing time.
- Ulcer completely healed by Day 14 (%).

The treatment was given for 1 month with topical antiviral, lubricating eye drops, cycloplegic and antibacterial drops.

The quantitative variables were compared using unpaired 't' test between the two groups and paired 't' test for pair comparison. Qualitative variables were compared using Chi-square test. A 'p' value of <0.05 was considered statistically significant.

OBSERVATIONS AND RESULTS

The mean age of the subjects in the two groups was not significantly different (39.04 ± 16.59 years vs. 38.22 ± 14.25 years, p = 0.77). Viral corneal ulcer was found to be more common in males as compared to females (63.2% males vs. 34.6% females, p = 0.041).

The ulcer size in both the groups was not significantly different on Days 1, 7 and 14. The ulcers completely healed by Day 21 in both the groups. There was no significant difference in the ulcer size on the follow-up visits in the two groups (Table 1). By 14th day, 80% ulcers were healed in Group I while 88% healed in Group II. There was no significant difference in the time required for healing in the two groups. The ulcer healing time was almost similar in the two groups (Table 2).

The BCVA after healing was also similar in the two groups (Table 3). Blurring of vision after instillation of drug in both the groups was mild-to-moderate and similar, with p = 0.109 (Table 4). In both the groups, majority of the patients did not have ocular irritation (Table 5). The difference in the development of diffuse punctate keratopathy between the two groups was not statistically significant, with p = 0.156 (Table 6).

Table 1. Comparison of Ulcer Size on Different Follow-up Days with Unpaired *t*-test

	Group I Acyclovir (n = 25)		Group II Ganciclovir (n = 25)		P value
	Mean	SD	Mean	SD	
Day 1	4.2840	1.7804	4.3853	2.0546	0.771
Day 7	0.2800	0.4278	0.1344	0.2652	0.083
Day 14	0.0440	0.1321	0.0162	0.0824	0.447
Day 21	0.0000	0.0000	0.0000	0.0000	NA

Table 2. Comparison of Ulcer Healing Time in the Two Groups

	N	Mean (days)	SD	P value
Group I (Acyclovir)	25	10.8000	5.106	0.085
Group II (Ganciclovir)	25	7.9609	4.002	

Table 3. Comparison of BCVA (log MAR)

	Group I Acyclovir (n = 25)		Group II Ganciclovir (n = 25)		P value
	Mean	SD	Mean	SD	
Day 1	1.0650	0.4113	1.1700	0.4133	0.214
Day 7	1.0180	0.4265	1.0271	0.4411	0.420
Day 14	0.8010	0.4640	0.8825	0.4585	0.507
Day 21	0.7410	0.4658	0.7164	0.4651	0.730

Table 4. Comparison of Blurring of Vision due to Drug Instillation

Blurring of vision due to drug	Group I (n = 25)		Group II (n = 25)	
	No.	%	No.	%
None	4	16	9	36
Mild	8	32	10	40
Moderate	8	32	4	16
Severe	5	20	2	8

$\chi^2 = 5.853$; p = 0.109.

Table 5. Comparison of Ocular Irritation due to Drug Instillation

Ocular irritation due to drug	Group I (n = 25)		Group II (n = 25)	
	No.	%	No.	%
None	14	56	15	60
Mild	10	40	10	40
Moderate	1	4	0	0
Severe	0	0	0	0

$\chi^2 = 1.268$; p = 0.531.

Table 6. Comparison of Development of Diffuse Punctate Keratopathy in Two Groups

Diffuse punctate keratopathy	Group I (n = 25)	Group II (n = 25)
Absent	25 (100%)	24 (96%)
Present	0 (0%)	1 (4%)

$\chi^2 = 1.907$; p = 0.156.

DISCUSSION

In our study, the percentage of ulcers that completely healed by Day 14 was 80% in Group I and 88% in Group II. In a clinical trial, conducted in Europe, the rate of healing in ganciclovir 0.15% group was 83.3% and the rate of healing in acyclovir 3% group was 70.6%, but the difference was not statistically significant.

In another study, the healing rate of 71.05% with acyclovir and 86.1% with ganciclovir was also not statistically significant. In a multicentric study to see the relative efficacy of ganciclovir 0.15% and acyclovir 3%, there was no statistically significant difference detected in the rate of healing between the two groups (p = 0.8387).

Our findings are similar to these findings.

Mean BCVA was recorded on each follow-up and no statistically significant difference was found between the two groups (Table 3). No study could be found in literature where the BCVA was compared using these two groups. However, a clinical trial compared the effect of acyclovir and placebo with acyclovir and dexamethasone on visual acuity in herpetic disciform keratitis. The change in visual activity was similar for both the groups.

The blurring of vision due to drug instillation was graded subjectively depending upon severity as 0-none, 1-mild, 2-moderate and 3-severe. In the present study, the difference between the two groups was not found to be statistically significant (Table 4).

However, in other multicentric studies, average duration of blurring was significantly shorter in ganciclovir group when compared to acyclovir group. The difference in our study may be because of the fact that those studies are from western world and patients in our study are less literate and aware.

The ocular irritation due to drug instillation was graded subjectively from 0 to 3. Majority of the patients did not report any ocular irritation (56% in Group I vs. 60% in Group II). The difference in ocular irritation between the two groups was not statistically significant with p = 0.531 (Table 5).

In a multicentric trial, the frequency of punctate keratitis was half in ganciclovir group. Most of the previously conducted studies have shown the rates of superficial punctate keratitis to be similar in both acyclovir and ganciclovir group.

In another multicentric trial, stinging was significantly lower in ganciclovir group (p = 0.3) on 14th day. However, the duration of stinging and blurring was not statistically significant.

In this respect, some studies correlate while some do not correlate with or study.

CONCLUSION

Topical acyclovir 3% and topical ganciclovir 0.15% gel were equally effective in ulcer healing time. The ulcer healing time with topical acyclovir 3% was directly proportional to size of corneal ulcer.

The improvement of BCVA was similar in both the groups. The tolerance of the patients to topical acyclovir and ganciclovir was similar with respect to blurring of vision, ocular irritation and diffuse punctate keratitis. So, the safety profile of both the drugs (acyclovir and ganciclovir) was found to be similar.

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Cardio-obstetrics, an Upcoming Field to Check Increase in Deaths due to Heart Disease During Pregnancy

A new report published February 18, 2019 in the American Heart Association's journal *Circulation: Cardiovascular Quality and Outcomes* has urged more team-based care for mothers with cardiovascular disease and those at risk and suggested that more collaboration between cardiologists and obstetricians could help curb the nation's soaring death rate among pregnant women. According to the report, cardio-obstetrics is "a clear area of need for improved quality of care".

Nitisinone Increases Melanin in People with Albinism

A small pilot clinical study at the National Eye Institute (NEI) suggests that the drug nitisinone increases melanin production in some people with oculocutaneous albinism type 1B (OCA-1B), a rare genetic disease that causes pale skin and hair and poor vision. Increased melanin could help protect people with the condition against the sun's UV rays and promote the development of normal vision. Study results were published in *JCI Insight*.

Can You be Punished for Something, which is not a Part of the Charge-sheet?

KK AGGARWAL*, IRA GUPTA†

The judgment of the Calcutta High Court in the matter of **Snigdhendu Ghosh vs. State of West Bengal & Ors** on 19 July, 2018 has answered many questions that arise when a medical negligence case is filed against a doctor, as follows:

- Limitation period in filing a complaint.
- Can you be punished for something which is not a part of the charge sheet?
- When can you appeal to GOI as a remedy?
- Can the High Courts interfere before all the remedies are exhausted?
- Can a council go to the Supreme Court? (This is like the lower court going to the Supreme Court against a High Court order).
- Is error of judgment negligence?
- Does giving three antibiotics in typhoid amounts to negligence?
- Is error in judgment an infamous act?
- When to pass a judgment in interim stage?
- Is it necessary for the Council to give reasoned judgments?
- What are the principles of natural justice?
- When challenging a Council decision, is it not necessary to make the patient a party?
- Can a doctor file compensation from Council for wrong decision?
- What did the Supreme Court do in this case?

West Bengal Medical Council vs Dr Snigdhendu Ghosh on 20 February, 2019/SLP/4132/2019/Arising out of impugned final judgment and order dated 19-07-2018 in MAT No. 28/2018 passed by the High Court At Calcutta). This petition was called on for hearing on 20-02-2019.

Coram: Hon'ble Mr. Justice Arun Mishra, Hon'ble Mr Justice Navin Sinha.

Order: No case is made out to interfere with the impugned order (s) passed by the High Court. The special leave petition is, accordingly, dismissed. However, this order shall not be treated as a precedent. Pending application(s), if any, shall stand, disposed of.

HIGH COURT ORDER NO. 1

Calcutta High Court (Appellete Side); Snigdhendu Ghosh vs. State of West Bengal & Ors on 19 July, 2018; in the High Court at Calcutta; Hon'ble Mr. Justice I.P. Mukerji and Hon'ble Justice Amrita Sinha, Ms. Manisha Bhowmick, Mr. Biplab Guha; Judgment On: 19.07.2017; I.P. Mukerji, J.:

I have had the privilege of going through the draft judgment prepared by my sister Amrita Sinha, J. I agree with the conclusions reached by her ladyship. Nevertheless, since this matter is of great importance I would like to deliver a separate concurring judgment.

The appellant is a very qualified and senior medical practitioner. In 1987, he obtained the MBBS degree from the Medical College, Kolkata. Thereafter, in 1992, he got the DCH qualification from Chittaranjan Seva Sadan, Kolkata. In 2009, he obtained MD in Pediatrics and DM in Neurology from PGIMER, Chandigarh. He worked in the Dhanbad Railway Hospital as pediatrician and thereafter with BR Singh Hospital. Now, he specializes in Neurology and works with KG Hospital, in Chittaranjan, district Bardhaman.

It so happened that on or about 24th December, 2010, the regular ward doctors of the hospital were on leave. The appellant was in charge, although he was a specialist in Neuroscience.

On that day, a young girl Purbasha Das of about 19 years of age was admitted to the hospital. Such admission was made on the advice of the outdoor doctor. She was suffering from fever for 2 or 3 days accompanied by loose motion and nausea. The hospital had no blood testing facility. On clinical examination

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†Advocate & Legal Advisor, HCFI

of the patient, the appellant prescribed a combination of two antibiotics and supporting drugs and IV fluid, namely, cefotaxime, ofloxacin, rantac injection, paracetamol and IV fluid. Later, on 25th December, 2010 on receipt of blood test reports, including the report of Widal test he advised the addition of a third antibiotic, chloromycetin, suspecting typhoid. The patient remained under his care till 26th December, 2010.

According to the statement made by the appellant before the State Consumer Disputes Redressal Commission, West Bengal, in the case subsequently started against him, CC Case No. 40 of 2012, "the patient was responding to the treatment and her condition quite stable and improving till 26th December, 2010."

From 27th December, 2010 the appellant relinquished charge of the ward. Dr Dipanjan Basak took charge of the patient.

The patient sharply deteriorated on 29th December, 2010. She developed acute respiratory complication. A chest X-ray was performed. She was then released from KG Hospital by her family and taken to Mission Hospital, Durgapur. She was admitted there on 30th December, 2010 in the very early hours, at 12.40 a.m. **This hospital made the diagnosis that she was suffering from septicemia with multiorgan failure.** The chest X-ray and CT scan revealed pulmonary edema and acute respiratory distress syndrome (ARDS). She expired that very night at 4.50 a.m. In the death certificate, the cause of death was stated to be ARDS together with sepsis plus multiple organ dysfunction syndromes.

On 12th January, 2011 Mr Himangsu Kumar Das, father of Purbasha Das, made a complaint to the Officer-in-Charge of Chittaranjan Police Station, Chittaranjan, West Bengal against the appellant, alleging criminal negligence. **On 13th January, 2011 the police drew up an FIR (FIR No. 1 of 2011 dated 13th January, 2011) against him and Dr Dipanjan Basak alleging commission of death by negligence under Section 304A of the Indian Penal Code.**

On 18th March 2011, the family of the deceased addressed a complaint to the Registrar, West Bengal Medical Council and others, including the Medical Council of India.

Now, further to the complaint of Mr Himangsu Kumar Das the learned Additional Chief Judicial Magistrate, Asansol on 2nd April, 2013 constituted a Medical Board consisting of the ACMOH, Asansol, Dr Nilanjan Chattopadhya and Dr Srikanta Gongopadhya. **This Medical Board opined that the medicines prescribed by the appellant were adequate for enteric fever and pneumonia.**

The family of the deceased did not stop there. **They moved the State Consumer Disputes Redressal Commission. They did not prosecute the matter there and the complaint was dismissed.**

On 6th April 2011, the Medical Council of India had asked the State Medical Council to enquire into the case and take action within 6 months under Clause 8.4 of the Indian Medical Council (Promotional Conduct, Etiquette and Ethics) Regulation, 2002. **On 19th August 2014, the learned Additional Chief Judicial Magistrate discharged the appellant as *prima facie* no negligence could be attributed to him.**

After an enquiry, on 2nd August, 2016, the appellant was charge-sheeted by the West Bengal Medical Council. It was issued under Section 17 read with Section 25 of the Bengal Medical Act, 1914, the charge-sheet was as follows: "*It appeared that there was some commission of errors in medical management of one patient, young girl, Purbasha Das at KG Hospital, Chittaranjan, which led to her death in multiorgan failure with respiratory complications, even though the case initially appeared to be a case of enteric fever.* ***Even though she was admitted with the diagnosis of RTI, no blood count or chest X-ray was performed.*** *On 29-12-2010, the patient developed acute respiratory complications and then chest X-ray was performed. She was subsequently referred to Mission Hospital, Durgapur, where the diagnosis came out to be septicemia with multiorgan failure. Chest X-ray and CT revealed occurrence of probable pulmonary edema or ARDS.* ***This quick onset indicated that between 27th and 29th December, 2010, there might be some errors in patient surveillance and on this score, you cannot be absolved of your responsibilities and that in relation there to you have been found prima facie guilty of infamous conduct in a professional respect***."

Thereupon, the appellant was charged with "error in patient surveillance" and "infamous conduct under the Bengal Medical Act, 2014."

There seems to be contradiction at the initial stage of the proceedings. The charge-sheet dated 2nd August, 2016 stated that the patient was admitted to KG Hospital "with the diagnosis of RTI" (respiratory tract infections). This is quite contradictory to other records. According to the appellant and not contradicted by any record, the patient was admitted to KG Hospital with 3-4 days history of vomiting, loose motion and fever. **A Widal test performed on the patient prior to admission to the hospital that there was an indication**

of typhoid or enteric fever. At any rate, there was no blood testing facility at the hospital.

In fact, the charge-sheet notice did not allege that the administration of triple antibiotics by the appellant caused death or injury to the patient. It simply said that on 29th December, 2010, the patient developed acute respiratory complications. X-ray and CT scan were carried out which revealed the existence of pulmonary edema and ARDS.

This stage quickly set in between 27th and 29th December, 2010. On 25th August, 2016, the appellant gave a detailed reply to the charge-sheet. His main points of defence were:

- By specialization, he is a neurologist. As no regular doctors were available, he was put in-charge of the ward, where the patient was kept.
- The patient was admitted into the hospital with symptoms of vomiting and loose motion. There was a pathological report accompanying her, which indicated that she suffered from typhoid. In those circumstances, the appellant administered the combination of three antibiotics. It is an approved practice amongst responsible medical practitioners possessing ordinary skill to use this kind of combination drugs to treat enteric fever or typhoid, according the appellant.

The patient improved while in his charge between 24th December, 2010 and 26th December, 2010. Thereafter, the doctor who was originally in-charge of her, Dr Dipanjan Basak, took over her responsibility on 27th December, 2010 at about 9 a.m. If at all the condition of the patient deteriorated, it was after the appellant relinquished charge of the patient. The treatment that was given to the patient by the appellant could not have been the cause of her death.

On 21st August 2017, the appellant received a communication from the Council dated 18th August, 2017 attaching its decision to remove his name from the register of medical practitioners by the required majority of two-third of the members present and voting, for a period of 1 year. The appellant was found guilty of infamous conduct.

The Council made the following observations:

- The appellant was "not rational" in treating the patient with three antibiotics;
- He was "deficient in his approach" not advising any blood test;
- He was "deficient in his approach" not advising any chest X-ray.

On 7th September, 2017, he preferred an appeal from the decision of the West Bengal Medical Council (WBMC) before the Appellate Authority constituted under Section 26(1) of the Bengal Medical Act, 1914.

Simultaneously, a writ was preferred in the Court challenging the decision. On 10th November, 2017, the writ application (WP No. 26252(W) of 2017) was disposed of by this court directing the Appellate Authority to dispose of the appeal pending before it within a forthnight from the date of communication of the said order.

This order was not complied with, by the appellate authority.

In those circumstances, the appellant moved the writ application (WP No. 28956 (W) of 2017). Upon having notice of this writ application the appellate authority preponed the hearing of the appeal from 6th December to 5th December, 2017. On 5th December, 2017, the appellant duly appeared before the appellate authority. On 7th December, 2017, the Joint Secretary (Medical Administration), Department of Health and Family Welfare passed an order upholding the decision of the West Bengal Medical Council. It held that between 24th December and 26th December, 2010, the patient was substantially under the care of the appellant. **It held that without blood culture, sensitivity, chest X-ray test, etc. three antibiotics could not have been administered simultaneously. On 11th December, 2017, the second writ application was disposed by this court recording that the appeal had been disposed on 7th December, 2017.**

The maintainability point was raised by Mr Bhowmick, learned counsel for the Council. **He said, there was an appeal provision before the Central Government from a decision of the Council removing the name of a medical practitioner from the register. Hence, the appellant ought to have availed of that remedy.**

An appeal from a decision of the Council under Section 17 read with 25 of the said **Act lies to the appellate authority, i.e., the State Government. Under the said Act, there is no further appeal from the decision of the State Government.**

An appeal lies to the Central Government under the Central Medical Act, 1957 read with Rule 27 of the Central Medical Council Rules, 1957 against removal of a doctor's name from the register.

In my opinion, removal of name means permanent removal from the register. It means a situation where the right of a doctor to practice is taken away

forever, and irreversibly. The appellant's licence to practice was suspended for 1 year. This is temporary. It does not attract Rule 27 of the Medical Council Rules.

Even if there was such a remedy, it should not be forgotten that the appellant complains of various acts of commission and omission of the respondents, which allegedly caused breach of the principles of natural justice. In the Whirlpool case (1999) 8 SCC 1, the Supreme Court told us that if a writ complains of breach of the principles of natural justice, a litigant could avoid the alternative remedy and come to the High Court in exercise of its jurisdiction.

Another point raised by Mr Bhowmick was that the issues in this **writ had become res judicata.** I do not agree.

An issue becomes res judicata if it is adjudicated upon. Only if an issue is adjudicated upon, could the secondary issues be covered by the doctrine of constructive res judicata. For example, six reliefs are sought from the court and five are granted, after adjudication. It can be said that the sixth was prayed for and refused. Therefore, an adjudication of some part of the issues raised is a sine qua non for operation of the principle of res judicata or constructive res judicata. **In this case, there has been no adjudication at all.** In the first writ, the Court referred the appellant to the alternative remedy without adjudication on the merits. In the second writ, the Court merely recorded that the adjudicating authority had made a decision on the complaint made by the appellant. It can by no stretch of imagination be said that the Court had actually adjudicated upon the merits of the matter. **This plea of res judicata is in my opinion mischievous and is rejected. For those reasons, the maintainability point fails.**

The third point raised by Mr Bhowmick was that this appeal was from an order refusing to pass an interim order interfering with the decision of the Council suspending the registration of the appellant for 1 year. He argued that if this Court proposed to pass any order it would tantamount to disposal of the writ application at the ad interim stage. He prayed for an opportunity to file an affidavit-in-opposition.

I reject the contention. **In this appeal, we propose to dispose of the writ application for the following reasons. The suspension of registration was for a period of 1 year.** More than 11 months of the suspension has been suffered by the appellant. Keeping the writ pending on technical grounds would result in the appellant suffering the whole of the punishment without remedy. The writ would thereby become infructuous.

It is true that the Supreme Court in various decisions has said that the Court at the interim stage should not pass orders that would effectively dispose of the writ application. Reference may be made to Council for Indian School Certificate Examination vs. Isha Mittal and Anr. reported in (2000) 7SCC 521, State of Uttar Pradesh and Ors. vs. Ramsukhi Devi reported in AIR 2005 SC 284, Secretary, U. P. S. C vs. S. Krishna Chaitanya reported in 2011 AIR SCW 4682, State of U.P. v. Hirendra Pal Singh reported in (2011) 5 SCC 305 cited by Mr Bhowmick.

This dictum of the Supreme Court is only true when the Court at the interim stage is evaluating the *prima facie* case of the parties. All the documents are not before the Court. They would be available on filing of affidavits. Hence, the Court gives an opportunity to the respondents to file an affidavit dealing with the allegations in the petition. At the same time, on the *prima facie* case an interim order is passed. Since, the entire evidence is not before the Court, the conclusions of the Court are *prima facie*. A final order should never be passed, at that stage. That would make hearing of the writ application, upon completion of affidavits, redundant.

In this case, all the essential documents are appended to the stay petition. The writ also involves substantial questions of law. When it is possible for us to dispose of the entire controversy between the parties on the basis of the papers before us **we do not think that this Court should observe the formality of inviting affidavits and sending the matter to the first Court for adjudication, thereby delaying justice to the point of defeating it.** This point of Mr Bhowmick is also rejected.

Mr Dhar, learned senior Advocate, appearing for the petitioner made the following submissions.

He said that the accusation of wrong administration of three antibiotics was not included in the charge-sheet. The appellant had no opportunity of dealing with the charge that he had administered three antibiotics irrationally. Secondly, he submitted that the patient was admitted in the hospital on 24th December, 2010, and she was under the care of the appellant till 26th. From 27th onwards, she was admittedly not under the appellant. Her treatment was regulated by the regular doctor at the ward. According to the findings of the Council, the condition of the patient deteriorated when the appellant was not in-charge of the ward.

He argues that the hospital did not have pathological facilities. That is why no blood test could be ordered at the time of the patient's admission. **Evaluating the**

condition of the patient and the blood test report which the patient's family obtained through an outside laboratory, which suggested enteric fever or typhoid, the appellant administered her three antibiotics. The board which was formed by the Additional Chief Judicial Magistrate, Asansol found the treatment adequate to cure typhoid and pneumonia. The appellant according to learned Counsel had adopted a mode of treatment, which was approved by a responsible body of medical practitioners, satisfying the Bolam test (discussed later).

The order of the West Bengal Medical Council did not contain sufficient reasons to justify the punishment imposed on the appellant. The appellant had administered the right treatment and that the Council has no case against him, Mr Dhar said.

The appellant had been charged under the **Bengal Medical Act, 1914** only. It is now the proper time to examine this Act. It constituted the West Bengal Medical Council. It prescribed a register of registered practitioners to be maintained.

*"**Section 25: Power to Council to direct removal of names from register, and re-entry of names therein. The Council may direct***

(a) that the name of any registered practitioner:

i. who has been sentenced by any Court for any non-bailable offence, such sentence not having been subsequently reversed or quashed, and such person's disqualification on account of such sentence not having been removed by an order which the 68 [State Government] 7070. Word subs. for the word "are" by the Government of India (Adaptation of Indian Laws) Order, 1937. [is] hereby empowered to make, if 7171. Words subs. for the words "they think" by the Government of India (Adaptation of Indian Laws) Order, 1937. [it thinks] fit, in this behalf; or

ii. whom the Council, after due enquiry for the words "as provided in Clause (b) of Section 17" by WB Act 16 of 1954. [in the same manner as provided in Clause (b) of Section 17] have found guilty, by a majority of two-thirds of the members present and voting at the meeting, of infamous conduct in any professional respect, be removed from the register of registered practitioners 73 [or that the practitioner be warned], and

(b) that any name so removed be afterwards re-entered in the register. It contains a very old and outdated expression "infamous conduct". If the Council by a majority of two-third members of the Council present and voting, after due enquiry, finds a registered practitioner guilty of "infamous conduct", his name is to be removed from the register of registered practitioners. Mr Dhar tried to contend that the proceedings were also conducted under the Code of Medical Ethics adopted by the West Bengal Medical Council on the basis of the Indian Medical Council (Professional Conduct Etiquette and Ethics) Regulations, 2002. This code of conduct may be supplementary to the Bengal Medical Act, 2014, but the records say that action against the appellant was taken under the said Act only."

An English decision of Bolam vs. Friern Hospital Management Committee reported in (1957) was affirmed by the Supreme Court in Jacob Mathew vs. State of Punjab and Anr. reported in (2005) 6SCC 1, cited by Mr Dhar.

If a medical condition involves the use of some special skill or competence then the test of negligent handling of the patient is not to be judged by the standards of an ordinary prudent man but according to the standards of an ordinary man professing and exercising that special skill.

A medical professional is not judged guilty because another professional of greater skill or knowledge would have prescribed a different treatment or conducted a surgical operation in a different way. It is enough that he has acted in accordance with a practice accepted as proper by a responsible body of medical men skilled in that particular art.

Chief Justice R. C. Lahoti pronouncing the judgment of the Supreme Court remarked that a medical professional's skill had to be exercised with a reasonable degree of care and caution. He gains nothing by being negligent. He has everything to lose.

An error of judgment on the part of the professional was not negligence *per se*. A medical professional was entitled to adopt a procedure for the patient involving a higher element of risk but with greater chances of success than a procedure with lesser risk and high chance of failure. If this type of risk taking ended in ill consequences for the patient, the doctor should not be hauled up for negligence. A medical practitioner cannot act in fear. If he has to worry about prosecution for every step he takes, then, he would not be able to render the service which is required of him.

I would like to quote a passage from a judgment of Denning LJ in Roe v. Ministry of Health reported in 1954 2 All ER. 131, referred to in Bolam; "Medical Science has conferred great benefits on mankind but benefits are attended by considerable risks. We cannot

take the benefits without taking the risks. Doctors learn by experience which often teaches in a hard way".

In Kusum Sharma and Ors. vs. Batra Hospital and Medical Research Centre and Ors. reported in (2010) 3 SCC 480, the Supreme Court reiterated the same principles as in the Jacob Mathew vs. State of Punjab and Anr case. One may refer to a passage from an English decision in Maynard vs. West Midlands Regional Health Authority reported in (1985) All.ER 635 (HL), set out in that judgment: "In the realm of diagnosis and treatment there is ample scope for genuine difference of opinion and one man clearly is not negligent merely because his conclusion differs from that of other professional men. The true test for establishing negligence in diagnosis or treatment on the part of a doctor is whether he has been proved to be guilty of such failure as no doctor of ordinary skill would be guilty of if acting with ordinary care." This case was also cited by Mr Dhar.

With regard to the point that the appellant was tried of offences with which he was not even charged, Mr Dhar relied in Union of India and Ors. vs. Gyan Chand Chattar reported in (2009) 12SCC 78 which said that an **enquiry had to be conducted in compliance with the principles of natural justice. The charges should be specific, definite and detailed. The same principles were reiterated by the Supreme Court in Anant R. Kulkarni vs. Y. P. Education Society and Ors reported in (2013) 6SCC** 515 and in Anil Gilurker Vs. Bilaspur Raipur Kshetriya Bramin Bank and Anr reported in (2011) 14 SCC 379.

I quote a very instructive passage from the judgment of Mr Justice Sabyasachi Mukharji in Sawai Singh vs. State of Rajasthan reported in (1986) 3SCC 454. Paragraph 16 and 17 as follows:

"16. It has been observed by this Court in Suresh Chandra Chakrabarty v. State of West Bengal [1971] 3 S.C.R. 1 that charges involving consequences of termination of service must be specific, though a departmental enquiry is not like a criminal trial as was noted by this Court in the case of State of Andhra Pradesh v. S. Sree Rama Rao [1964] 3 S.C.R. 25 and as such there is no such rule that an offence is not established unless it is proved beyond doubt. But a departmental enquiry entailing consequences like loss of job which now-a-days means loss of livelihood, there must be fair play in action, in respect of an order involving adverse or penal consequences against an employee, there must be investigations to the charges consistent with the requirement of the situation in accordance with the principles of natural justice in so far as these are applicable in a particular situation.

17. The application of those principles of natural justice must always be in conformity with the scheme of the Act and the subject matter of the case. It is not possible to lay down any rigid rules as to which principle of natural justice is to be applied. There is no such thing as technical natural justice. The requirements of natural justice depend upon the facts and circumstances of the case, the nature of the enquiry, the rules under which the Tribunal is acting, the subject matter to be dealt with and so on. Concept of fair play in action which is the basis of natural justice must depend upon the particular lis between the parties. (See K.L. Tripathi v. State Bank of India & Ors., [1984] 1 S.C.C.)

43) Rules and practices are constantly developing to ensure fairness in the making of decisions which affect people in their daily lives and livelihood. Without such fairness democratic governments cannot exist. Beyond all rules and procedures that is the sine qua non."

The contention of the appellant is absolutely right. **He was not charged with having administered three antibiotics negligently. Yet he was tried for it.** It was not proper for the Council or the appellate authority to hold that administration of three antibiotics without blood test and chest X-ray was not proper conduct on the part of the appellant, when he did not have the chance to explain his line of treatment. This is clear violation of the principles of natural justice.

Moreover, we permitted the appellant to produce and the appellant did produce at the time of hearing of the appeal a British Medical Advisory. It suggested that the use of three antibiotics concurrently was not uncommon to treat serious and drug-resistant bacteria. Furthermore, in the hospital attended by the appellant, there was no facility for blood test. Using his clinical judgment, he prescribed three antibiotics. It is not controverted that the appellant was not the regular doctor at the ward, where the patient was admitted. He was a neurologist. He was asked to take charge temporarily from 24th to 26th December, 2010, in the absence of the regular doctor of the ward. Hence, if the treatment procedure of the medical practitioners from the time of the admission of the patient to the hospital from 24th December, 2010 till her death 30th December, 2010 is to be examined and it is shown that more than one medical practitioner, including the appellant attended to the patient, one has to show whether any action of the appellant, between 24th and 26th December, 2010 contributed to the death of the patient. There is nothing on record to suggest that the administration of any medicine in those 3 days or the adoption of any other mode of treatment had caused the death of the patient or had contributed substantially or partially to her death. In fact, the records show that

the patient got worse only from 27th December, 2010 and that the worsening of her condition was not due to any action on the part of the appellant.

It was contended by Mr Bhowmick that whether the conduct of a registered practitioner complained against was infamous or not was decided by the Council by two-third majority present and voting, in accordance with Section 25 of the said Act. The Council might decide that his name was to be removed from the register of registered practitioners or that he be warned. **He said that there was no scope under the said Act to give reasons.**

I am Unable to Agree

First of all, the Bengal Medical Act, 1914 is a very ancient Act. The principles of administrative law were just about germinating at that point of time. **It is true that the Act does not say that the Council has to give reasons for its decision.** It only says that the members have to vote with regard to the conduct of the person under enquiry. **But there is a provision for enquiry.** Now this provision of enquiry has to be given an interpretation to make this Act compatible with the principles of administrative law of our age. **The principles of natural justice have to be necessarily read into the ambit and scope of the enquiry.** In my opinion, when the required majority comes to a decision, the reasons in support thereof have to be given. No such reasons are available. The order of the appellant authority suffered from the same vice. The delinquent was being made to suffer serious civil consequences without any reasons.

In my opinion, while applying the Bolam Test, one has to not only assess the skill required of a doctor to treat a particular patient and the skill displayed by him in rendering the treatment but one has to also consider the medical facilities and technology available to him at the place of treatment or any other facility, readily available within a reasonable distance, on the requisition of the doctor, to treat the patient. The time available to administer treatment and the time within which the medical facility and technology could be availed of and which were availed of or not availed of by the doctor have to be taken into account. The facilities at the hospital of Chittaranjan were limited. The patient was admitted in the evening of 24th December, 2010. KG Hospital had no blood testing facility. In a small town like Chittaranjan, one does not expect to find the most modern facilities for treatment. Therefore, if on the basis of the blood report of the patient of the following day, 25th December, 2010 which indicated typhoid, the appellant using his clinical judgment had administered two antibiotics, the previous right and the third antibiotic on receipt of the blood report, it could safely be said by a responsible body of medical practioners having the skill to treat this kind of a tropical infection that the appellant had employed his medical skill reasonably, satisfying the Bolam test.

At the end, I note that the victim patient's family was not represented in Court. On several occasions, we had enquired of learned counsel for the appellant whether the victim had been noticed. He replied that the victim's family had been attempted to be served but could not be found. **Furthermore, I note that Mr Bhowmick did not make any submissions on the merits of the case. He only raised the maintainability points discussed above.**

Thus, I hold that the removal of the name of the appellant from the register of practitioners for a period of 1 year or suspension of his right to practice for a period of 1 year was wholly without any basis and hence wrongful and illegal.

I set aside the impugned order of suspension of the appellant's right to practice for a period of 1 year made by the respondent council by its decision dated 18th August, 2017 and affirmed on 7th December, 2017 by the appellate authority, by quashing the same. The appellant will be entitled to resume practice immediately.

I have not gone into the question of any loss and damage suffered by the appellant for being denied the right to practice from 18th August, 2017 till the date of this judgment and order.

Such right of the appellant is kept open to be urged in a separate proceeding if he wants to initiate the same.

(I.P. Mukerji, J.) Amrita Sinha, J.:-

HIGH COURT ORDER NO. 2

This appeal has been filed at the instance of the writ petitioner challenging the order dated 3rd January, 2018 passed by the Learned Single Judge in W.P. No. 31338 (W) of 2017 refusing to pass interim order in the matter. The appellant a medical practitioner filed the aforesaid writ petition being aggrieved by and dissatisfied with the decision of the West Bengal Medical Council (hereinafter referred to as "WBMC" for the sake of brevity) contained in memo bearing no. 3165-C/28-2011 dated 21st August, 2017, and the order dated 7th December, 2017 passed by

the Principal Secretary, Health and Family Welfare Department and the Appellate Authority of WBMC. By the order dated 7th December, 2017, the Appellate Authority dismissed the appeal preferred by the appellant against imposing penalty for removal of his name from the register of medical practitioners maintained by the West Bengal Medical Council for a period of 1 year from the date of communication of the order under Section 25(a) (ii) of the Bengal Medical Act, 1914.

The facts of the case are as follows:

On 24th December, 2010, a 19-year-old girl was admitted in the female ward of Kasturba Gandhi Hospital, Chittaranjan, Burdwan with symptoms of fever, loose motion and vomiting which according to her father had been continuing for 3-4 days before such admission. The appellant though attached to the said hospital as Neurologist was in-charge of the female ward of the said hospital on and from 24th December, 2010 to 26th December, 2010 as the regular in-charge Dr Dipanjan Basak was on leave.

The girl was examined by Dr Ajay Kumar at the outpatient department and on his advice the girl was admitted in the hospital. The appellant examined her clinically and administered drugs like cefotaxime, ofloxacin, ondansetron, ranitidine and paracetamol as he was of the opinion that the patient was suffering from typhoid fever. At the time of admission, the father of the girl handed over certain pathological reports which also suggested that the girl was suffering from enteric fever.

According to the appellant, the condition of the girl improved upon administration of the aforesaid medicines and he included another drug namely chloramphenicol as he came to a fair conclusion that the patient was suffering from typhoid. The condition of the patient was stable till 26th December, 2010.

On 27th December, 2010, the regular in-charge Dr Dipanjan Basak resumed his duties and took over charge of the female ward, where the patient was admitted. The appellant did not have any occasion to treat the patient any further.

On and from 28th December, 2010, the condition of the patient deteriorated and on 29th December, 2010, the girl had serious respiratory problem. X-ray was conducted which revealed that one of her lungs was severely damaged and the other was seriously affected by pneumonia. The girl was referred to Mission Hospital, Durgapur. The girl expired on 30th December, 2010. The father of the victim girl lodged a complaint against the appellant before the West Bengal Medical Council on 12th January, 2011 as well as before the Officer-in-Charge, Chittaranjan Police Station, Burdwan on 13th January, 2011 praying for taking legal action against him and for cancellation of his medical registration.

Pursuant to the complaint lodged by the father of the victim, the police registered FIR and initiated a case against the appellant under Section 304A IPC. The police investigated the case and submitted the report in final form in the Court of the Learned Additional Chief Judicial Magistrate, Asansol on 20th November, 2013. The father of the victim being dissatisfied with the final report tendered by the police in the said case filed a Narazi petition before the learned Court which was taken up for consideration and further re-investigation was directed to be conducted by the police. As the question before the learned Court whether the death of the girl was due to rash and negligent act of the doctor required specialized skill, the learned Court referred all the medical documents in connection with the treatment of the victim girl to the Chief Medical Officer, Burdwan for his comment who in turn forwarded all the said documents to the Additional Chief Medical Officer of Health, Asansol who constituted a medical board consisting of himself and two other doctors. The board unanimously opined that the medication in the doses mentioned would have in the normal course of the event be sufficient to cure both the enteric fever and pneumonia. They further opined that however in a small percentage of case death may supervene in both enteric fever and pneumonia.

Vide order dated 19th July, 2014, the learned Court after perusal of the case diary came to the conclusion that there was no negligence on the part of the appellant in the treatment conducted by him since her admission in the said hospital. The final report of the police was accepted and the appellant was discharged from the said case.

The victim's father lodged another complaint against the appellant before the State Consumer Disputes Redressal Commission, West Bengal praying for taking legal action against the appellant and for cancellation of his medical registration. However, vide order dated 11th March, 2016, the said complaint case being No. CC/40/2012 was dismised for nonprosecution. The father of the victim lodged a further complaint against the appellant before the Registrar, WBMC on 18th March, 2011. The WBMC considered the charges and found the appellant guilty of infamous conduct in a professional respect and passed order for removal of his name from the register of registered medical practitioners maintained by the West

Bengal Medical Council for a period of 1 year from the date of communication of the order under Section 25(a)(ii) of the Bengal Medical Act, 1914. The appellant had been advised to submit his original medical registration certificate to the WBMC for the next course of action. The aforesaid order was communicated to the appellant by the Registrar, WBMC vide original medical dated 18th August, 2017. The appellant challenged the aforesaid order of the WBMC by filing appeal before the Principal Secretary, Health Department on 21st September, 2017. As the said appeal was kept pending for a considerable period of time accordingly the appellant preferred a writ petition before this Hon'ble Court being W.P. 26252 (w) of 2017 and vide order dated 10th November, 2017, this Hon'ble Court passed necessary orders upon the Appellate Authority to consider and decide the appeal in accordance with law within a fortnight from the date of communication of the order.

As the Appellate Authority did not consider and dispose the appeal within the time specified by this Hon'ble Court, the appellant filed a second writ petition praying for passing necessary order for disposal of the appeal. The said writ petition being W.P. No. 28956 (W) of 2017 was taken up for consideration and vide order dated 11th December, 2017, the same had been disposed of based on the submission made on behalf of the WBMC that during pendency of the writ petition final order disposing the appeal had been passed by the Appellate Authority on 7th December, 2017.

The order of the Appellate Authority dated 7th December, 2017 communicated to the appellant vide letter dated 11th December, 2017 issued by the Joint Secretary to the Government of West Bengal was the subject matter of challenge in the writ petition being W.P. No. 31338 (W) of 2017. The learned Single Judge vide order dated 3rd January, 2018 had issued direction to file affidavit-in-opposition within 4 weeks and reply thereto within 2 weeks thereafter. The point of maintainability of the writ petition had been kept open. The learned Single Judge felt prudent not to grant any interim order at that stage. Being aggrieved the writ petitioner filed the instant appeal praying for necessary orders.

Submissions on Behalf of the Appellant

The primary charge framed against the petitioner vide letter dated 2nd August, 2016 issued by the Registrar, WBMC was as follows:

"It appeared that there was some commission of errors in medical management of one patient, young girl Purbasha Das at KG Hospital, Chittaranjan, which led to her death in multiorgan failure with respiratory complications even though the case was initially appeared to be a case of enteric fever. Even though she was admitted with the diagnosis of RTI, no blood count or chest X-ray was performed. On 29.12.2010, the patient developed acute respiratory complications and then chest X-ray was performed. She was subsequently referred to Mission Hospital, Durgapur where the diagnosis came out to be septicemia with multiorgan failure. Chest X-ray and CT revealed occurrence of probable pulmonary edema or ARDS. This quick onset indicated that between 27th and 29th December, 2010, there might be some errors in patient surveillance and on this score you cannot be absolved of your responsibilities and that in relation thereto you have been found prima facie guilty of infamous conduct in a professional respect".

The appellant had been directed to show cause in writing within 21 days why his name should not be removed from the register of registered practitioners pursuant to Section 17/25 of the Bengal Medical Act, 1914. The appellant had been requested to bring the certificate of registration in original and also updated registration certificate and to submit the same before start of hearing failing, which his case would be heard and decided *ex parte*. The appellant submitted his show cause before the Registrar, WBMC on 25th August, 2016. The WBMC took up the case of the appellant for hearing on 12th July, 2017 and after considering the charges found him guilty of infamous conduct in a professional respect and decided that his name be removed from the register of registered medical practitioners for a period of 1 year from the date of communication of this order in this respect under Section 25(a)(ii) of the Bengal Medical Act, 1914.

The WBMC at the time of passing the aforesaid order of removal of the name of the appellant from the register of medical practitioners observed the following:

"(a) Dr Snigdhendu Ghosh was not rational in continuation of treatment of the patient with three antibiotics at the initial stage.

(b) He was deficient in his approach in not advising any blood test to exclude the other prognosis of the case, if any.

(c) He was deficient in his approach in not advising in any chest X-ray of the patient to exclude the other prognosis of the case, if any".

The specific case made out by the appellant is that the charge had been framed after a period of 6 years from the date of the incident. The charge was

pre-determined and biased. The statements and findings mentioned in the charge were wholly incorrect. The charge specifically mentioned that 'there was some commission of errors in medical management' of the patient leading to her death. It was further mentioned that 'the quick onset indicated that between 27th and 29th December, 2010, there might be some errors in patient surveillance'.

The appellant strenuously contended that the patient was under his care from 24th December, 2010 to 26th December, 2010. He could not be held responsible for the acute respiratory complications that developed in the patient after the said date. It is also submitted that the patient was admitted in the hospital with the symptoms of fever, loose motion, vomiting for the last 3-4 days prior to her admission in the hospital. There was no indication of any RTI as alleged in the memorandum of charge. The widal test report of the patient was positive and accordingly the necessary antibiotics had been administered to her. Blood test was prescribed to detect: (a) Hemogram including malaria parasite, (b) malaria antigen (MP), (c) typhoid (Widal test), (d) liver function test (LFT), (e) hepatic condition (HBsAg) and (f) sugar/urea/creatinine.

It was categorically submitted that chest X-ray had not been advised because the patient did not show any signs of respiratory problem on and from 24th December to 26th December, 2010. It was pointed out that the death certificate issued by the Mission Hospital, Durgapur mentioned the cause of death as 'acute respiratory distress syndrome, sepsis and multiorgan dysfunction syndrome'.

The learned Advocate appearing for the appellant placed before the Court photocopies of the extracts from the book 'Principles of Respiratory Medicine' written by Farokh Erach Udwadia, Zarir F. Udwadia and Anirudh F. Kohli published by Oxford University Press wherein the clinical features of ARDS have been discussed. **It has been mentioned therein 'against a background of one of the etiologies mentioned earlier, the patient with ARDS present with rapidly worsening dyspnea and restlessness.** On examination, such a patient has tachycardia, tachypnea and increasing hypoxemia despite supplemental oxygen. Auscultation reveals scattered crackers and occasionally a wheeze. The condition may evolve rapidly over a few hours, or may take a few days to reach its maximum intensity. Respiratory distress is obvious, and the accessory muscles of respiration are active. Cyanosis may occur, but is not always evident in spite of severe hypoxemia".

The learned Advocate also placed before this Court photocopy of extracts from the book 'Fishman's Pulmonary Diseases and Disorders' and placed before us a list of drugs which induced lung disease due to nonchemotherapeutic agents and submitted that none of the medicines, which had been prescribed by the appellant contained the aforesaid drugs and accordingly the medicines prescribed by the appellant were in no way responsible for the development/aggravation of the ARDS, which was the cause of the death of the patient.

The learned Advocate further submitted that the medical board which had been formed in terms of the order passed by the learned Additional Chief Judicial Magistrate, Asansol consisting of the Additional Chief Medical Officer of Health, Asansol and two other doctors had unanimously opined that the medication in the doses administered by the appellant would have in the normal course of the event be sufficient to cure both the enteric fever and pneumonia. However, in a small percentage of case death may supervene in both enteric fever and pneumonia. Accordingly, there had been no infamous conduct at all on the part of the appellant.

Section 25 of the Bengal Medical Act, 1914 gives the power to the Council to direct removal of names from the register and re-entry of names therein. Section 25(a) (ii) mentions that the Council may direct that the name of any medical practitioner whom the Council after due enquiry in the same manner as provided in Clause (b) of Section 17 have found guilty, by a majority of two-thirds of the members present and voting at the meeting, of infamous conduct in any professional respect, be removed from the register of registered practitioners or that the practitioner may be warned.'Infamous conduct' has not been defined in the Act. Clause 37 of the Code of Medical Ethics adopted by the WBMC mentions that disciplinary action may be taken against the registered medical practitioners upon offences and form of professional misconduct, which may be brought before the Council for disciplinary action. Decision on complaint against delinquent physician shall be taken preferably within 6 months. Clause 38 of the said Code mentions the disciplinary actions that may be taken by the WBMC, namely, i. Censure, ii. Warning, iii. Removal of name of the registered practitioner for a specific period up to 3 years or permanently according to the nature of offence and the decision to be taken by the WBMC. Clause 39 of the said Code lists the offences for which disciplinary action may be taken by the Council, namely:

a) Adultery or improper conduct or association with the patient,

b) Conviction by Court of Law for offences involving moral turpitude/criminal acts,

c) Misconduct, The following acts of commission or omission on the part of a physician shall constitute professional misconduct rendering him/her liable for disciplinary action;

d) Violation of the Regulation-

   i. If he/she commits any violation of these Regulations.

   ii. If he/she does not maintain the medical records of his/her indoor patients for a period of three years as per Regulations.

(e) Sex determination test.

The appellant contended that since the cause of action arose in the year 2010 and the alleged inquiry was conducted and impugned order passed in 2017 the case was hopelessly barred by limitation and no action far less passing order of penalty could be passed on the basis of the said complaint. He further contended that none of his actions could be treated as infamous conduct in a professional respect and accordingly the penalty of removal of his name from the register of medical practitioners is bad in law and liable to be set aside.

The learned Advocate further submitted that the opening line of the charge-sheet mentioned 'that there was some commission of errors in medical management' and lastly it was mentioned 'this quick onset indicated that between 27th and 29th December, 2010, there might be some errors in patient surveillance and on this score you cannot be absolved of your responsibilities' wherefrom it can be understood that there might be some errors in medical management on his part and the same cannot under any stretch of imagination be held to be infamous conduct by him. Moreover, as per the charge-sheet, there might be some error in patient surveillance between 27th and 29th December, 2010 but as the appellant was not in-charge of the patient after 26th December, 2010 accordingly he ought not to be held responsible for the same.

It was further submitted that the penalty proposed to be passed against the appellant was mentioned in the charge-sheet itself which shows that the WBMC had conducted the alleged enquiry with a predetermined and biased mindset. The authorities had made up their mind that irrespective of the outcome of the enquiry the punishment of removal of the name of the appellant was the only order that could be passed in the case. That was exactly the reason why the appellant had been directed to bring with him the original registration certificate at the time of the hearing. The learned Advocate for the appellant has taken a specific plea that the charge framed against the appellant and the reasons for his punishment are different. It has been pleaded that there had been gross violation of the principles of natural justice as the reasons mentioned in the charge-sheet were not the reasons for which punishment had been imposed upon the appellant. The issue of administering three antibiotics to the victim was not the charge against the appellant, whereas the order of punishment specifically mentioned that it was not rational for the appellant in continuation of the treatment of the patient with three antibiotics at the initial stage. He further submits that prescription of three antibiotics is not an uncommon phenomena in medical field.

The learned Advocate for the appellant denies that the appellant was in any manner deficient in not advising blood test of the patient which is an absolute perverse finding in as much as the appellant had advised as many as six blood tests which were duly conducted and necessary medicines had been administered upon taking into consideration the blood reports of the patient. The prescription to conduct blood test is annexed with the writ petition which is annexed with the application for stay.

It was submitted that principles laid down by the Hon'ble Supreme Court in the various judgments dealing with medical negligence had not been followed by the authorities at the time of deciding the case of the appellant. Judgments relied upon by the appellant:

i. Kusum Sharma and Others vs. Batra Hospital and Medical Research Centre and Others reported in (2010) 3 SCC 480.

ii. Jacob Mathew vs. State of Punjab reported in (2005) 6 SCC 1.

iii. Union of India and Others vs. Gyan Chand Chattar reported in (2009) 12 SCC 78.

iv. Anant R. Kulkarni vs. Y.P. Education Society and Others reported in (2013) 6 SCC 515.

v. Sawai Singh vs. State of Rajasthan reported in (1986) 3 SCC 454.

vi. Anil Gilurker vs. Bilaspur Raipur Kshetriya Gramin Bank and Another reported in (2011) 14 SCC 379.

Submissions on Behalf of WBMC

At the time of hearing the main point raised by the learned Advocate appearing on behalf of WBMC

was that the appeal was being heard against refusal to pass interim order and accordingly the main matter ought not to be heard on merits. It had been vehemently contended that there is an alternative remedy available to the appellant under Section 24 of the Indian Medical Council Act, 1956, where the appellant may prefer appeal before the Government against the impugned order of penalty. It had been further contended that this was the third writ petition filed by the appellant on the self-same cause of action and accordingly the writ petition and the appeal arising therefrom is liable to be dismissed on the ground of constructive res judicata.

The learned Advocate for the respondent specifically contended that WBMC is not obliged to give reasons for their decision adopted in their meeting held on 12th July, 2017. It has been submitted that the Bengal Medical Act, 1914 is a valid piece of legislation and as per provision of Section 25(a)

(ii) the Council by a majority of two-thirds of the members present and voting at the meeting may direct removal of the name of the registered practitioner for infamous conduct in any professional respect.

It has been submitted that since there is a specific provision for preferring appeal as per provision of Section 24 of the Indian Medical Council Act, 1956 accordingly the instant appeal is liable to be rejected on the ground of availability of alternative remedy.

He further submitted that there is no scope for passing any interim order in the instant appeal as the impugned order of penalty had already been given effect to and the name of the appellant had already been struck off from the register of medical practitioners. It has been submitted that the respondents will lose an appellate forum if the appeal is entertained and the scope of the writ petition ought not to be enlarged before the Hon'ble Appeal Court. The learned Advocate further submits that there had not been any occasion on the part of the learned Single Judge to decide the matter on merits and accordingly the appeal Court ought not to hear out the main matter. He submits that the writ petition is at an interim stage and no order ought to be passed, which may decide the main issue and may grant the final relief in favor of the appellant. He prays for remand of the matter before the learned Trial Judge so that he can place the entire facts and defend the case on merits.

Judgments Relied Upon by WBMC

i. Cicily Kallarackal vs. Vehicle Factory reported in (2012) 8 SCC 524.

ii. Authorised Officer, State Bank of Travancore and Another vs. Mathew K.C. reported in 2018 (1) Supreme 471.

iii. Council for Indian School Certificate Examination vs. Isha Mittal and Another reported in (2000) 7 SCC 521.

iv. Forward Construction Company and Others vs. Provat Mandal (Regd.), Andheri and Others reported in AIR 1986 SC 391. v. Sheela Devi vs. Jaspal Singh reported in 1999 AIR SCW 2214. vi. Medical Council of India vs. State of West Bengal reported in 2012 (1) CHN (Cal) 46.

v. Unreported judgment of this court dated 1st September, 2011 passed in W.P. No. 781 of 2011 (Dr. Shyama Prasad Sar vs. The State of West Bengal and Others).

Observations of the Court

In Kusum Sharma and Others (supra) Supreme Court held that medical science has conferred great benefits on mankind, but these benefits are attended by considerable risks. We cannot take the benefits without taking risks. In this case, Court reiterated the observations made in the land mark judgment of Jacob Mathew vs. State of Punjab (supra) that in the law of negligence professionals such as lawyers, doctors, architects and others are included in the category of persons professing some special skill or skilled persons generally. The standard to be applied for judging whether the person charged has been negligent or not, would be that of an ordinary competent person exercising ordinary skill in that profession. It is not necessary for every professional to possess the highest level of expertise in that branch which he practices.

In Jacob Mathew's case the Hon'ble Supreme Court heavily relied on the judgment delivered in the case of Bolam vs. Friern Hospital Management Committee reported in (1957) 2 All. ER 118 where in it had been observed that a doctor is not negligent, if he is acting in accordance with a practice accepted as proper by a reasonable body of medical men skilled in that particular art, merely because there is a body of such opinion that takes a contrary view. Deviation from normal practice is not necessarily evidence of negligence. To establish liability on that basis it must be shown (1) that there is a usual and normal practice; (2) that the defendant has not adopted it and (3) that the course in fact adopted is one no professional man of ordinary skill would have taken had he been acting with ordinary care. The Hon'ble Supreme Court on

scrutiny of the leading cases of medical negligence both in our country and other countries specially the United Kingdom has laid down certain principles while deciding whether the medical professional is guilty of medical negligence or not. Some of them are as follows:

1. Negligence is an essential ingredient of the offence. The negligence to be established by the prosecution must be culpable or gross and not the negligence merely based upon an error of judgment.
2. A medical practitioner would only be liable where his conduct fail below that of the standards of a reasonably competent practitioner in his field.
3. Negligence cannot be attributed to a doctor so long as he performs his duties with reasonable skill and competence. Merely because the doctor chooses one course of action in preference to the other one available, he would not be liable if the course of action chosen by him was acceptable to the medical profession.
4. Just because a professional looking at the gravity of illness has taken higher element of risk to redeem the patient out of his/her suffering which did not yield the desired result may not amount negligence.
5. It is our bounden duty and obligation of the civil society to ensure that the medical professionals are not unnecessarily harassed or humiliated so that they can perform their professional duties without fear and apprehension.
6. The medical professionals are entitled to get protection so long as they perform their duties with reasonable skill and competence and in the interest of the patients.

The Hon'ble Supreme Court in the said judgment of Kusum Sharma (supra) specifically directed that the aforementioned principles must be kept in view while deciding the cases of medical negligence. It should not be understood to have held that doctors can never be prosecuted for medical negligence. As long as the doctors performed their duties and exercised an ordinary degree of professional skill and competence, they cannot be held guilty of medical negligence. It is imperative that the doctors must be able to perform their professional duties with free mind.

In the case of Union of India and Others vs. Gyan Chand Chattar (supra) relying upon the case of Sawai Singh vs. State of Rajasthan (supra) Supreme Court held that in a domestic enquiry the charge must be clear, definite and specific as would be difficult for any delinquent to meet the vague charges. There must be fair play in action particularly in respect of an order involving adverse or penal consequences. The Court held that an enquiry is to be conducted against any person giving strict adherence to the statutory provisions and principles of natural justice. No enquiry can be sustained on vague charges. The findings should not be based on conjectures and surmises. Every act or omission on the part of the delinquent cannot be a misconduct. The same principle has been reiterated in the case of Anil Gilurker (supra).

The case of Anant R. Kulkarni (supra) cited by the learned Advocate of the appellant is on the similar line of the above case wherein the Court reiterated that a delinquent should not be served with a charge-sheet without providing him a clear, specific and definite description of the charge against him. When statement of allegations are not served with the charge-sheet, the enquiry stands vitiated, as having been conducted in violation of the principles of natural justice.

The judgment referred to above in the case of Cicily Kallarackal, Authorized Officer, State Bank of Travancore and Another, Council for Indian School Certificate Examination and Sheela Devi is primarily on the ground of not entertaining writ petitions due to availability of alternative remedy. There is no second opinion about it. What is required to be seen is whether the alternative remedy available to the petitioner is efficacious and whether the action of the respondents is vitiated by jurisdictional error or patent violation of the principles of natural justice so as to enable the writ Court to exercise jurisdiction in the matter.

In the instant case, the cause of action arose on 13th January, 2011, when a complaint was lodged by the father of the victim girl who expired on 30th December, 2010. As per Clause 37 (iv) of the Code of Medical Ethics published by the WBMC a decision on complaint against a delinquent physician shall be taken preferably within 6 months. Admittedly in this case, the charge memo was issued against the petitioner on 2nd August, 2016, and final order had been passed for removal of the name of the appellant on 21st August, 2017.

Moreover, from the order of punishment it can be seen that the appellant had been punished on the basis of infamous conduct which was not specified in the memorandum of charge i.e.; **the appellant was punished for an offence not mentioned in the charge memo.** The appellant did not have any opportunity to controvert the allegation mentioned in the order of penalty. The same appears to be gross violation of the

principles of natural justice as the Hon'ble Supreme Court has repeatedly observed in various decisions that the **charge leveled against a delinquent must be specific** and there must be fair play in action in respect of an order involving adverse or penal consequences resulting in loss of job or livelihood.

A plain reading of the charge memo issued against the appellant shows that there appeared some commission of errors in medical management in respect of the victim, which led to her death due to multiorgan failure. It was mentioned that no blood count or chest X-ray was performed. It was further mentioned that the quick onset of probable pulmonary edema or ARDS between 27th and 29th December, 2010 indicated, there might be some errors in patient surveillance and on that score the appellant cannot be absolved in his responsibilities and had been found *prima facie* guilty of infamous conduct in a professional respect. Admittedly blood tests were advised by the appellant when she was admitted at the hospital. The prescription for conducting blood test and the test reports are annexed with the writ petition. It is further admitted that the appellant treated the patient from 24th December, 2010 to 26th December, 2010. The period when the alleged ARDS developed in the victim the appellant was not in-charge of the patient. Accordingly, the question of committing error in patient surveillance between 27th and 29th December, 2010 does not arise at all. **Moreover, neither the charge memo nor the impugned order of WBMC and the appellate authority indicate that the condition of the patient deteriorated and turned fatal due to the medicines administered by the appellant. In the absence of the specific charge to that effect the appellant could not have been held to be guilty of the alleged misconduct.**

The appellant submitted his show cause to the charges mentioned in the charge memo. The order of penalty speaks otherwise. It states that the appellant was not rational in continuation of the treatment of the patient with three antibiotics at the initial stage. **The order did not suggest that the patient expired due to intake of three antibiotics.** The appellant was not given any opportunity to meet the charge of using three antibiotics for treatment of the patient.

The charge of administering three antibiotics was not mentioned in the charge memo. The appellant did not have any chance or scope to deal with the said charge. The appellant ought to have been given a reasonable opportunity to defend his stand. This in my view is serious violation of natural justice.

It appears from records that on the complaint lodged by the father of the victim before the police station the learned Additional Chief Judicial Magistrate, Asansol referred the medical documents in respect of the victim to the Chief Medical Officer Health, Burdwan who forwarded the papers to the Additional Chief Medical Officer of Health, Asansol. A medical board was constituted consisting of the Additional Chief Medical Officer of Health, Asansol along with two other doctors. The board unanimously opined that the medication in the doses mentioned would have in the normal course of the event be sufficient to cure both the enteric fever and pneumonia. However, in a small percentage of case death may supervene in both enteric fever and pneumonia. The above unanimous **decision of the doctors suggests that the procedure of treatment adopted by the appellant was neither illegal nor new or uncommon in medical jurisprudence.** In fact it was an accepted practice by the doctors and it was quite normal to treat the patient with the said medicines.

The WBMC may have a divergent opinion about it but the same ipso facto does not render the procedure adopted by the appellant wrong or the conduct of the appellant infamous. Moreover, the report of the medical board was not challenged by the complainant and the order of the Ld. Court dismissing the complaint case had attained finality as far back as on 19-07-2014. Trying the appellant for the same offence all over again and penalizing him for the same is absolutely illegal and not permissible in law. As regards observation of not advising chest X-ray of the patient the appellant had already dealt with the same in his show cause. He has specifically stated that chest X-ray was not done as there was no symptom of RTI. He further stated that there is no protocol at Kasturba Gandhi Hospital to perform chest X-ray in every case of fever. The report of Widal test conducted for detecting typhoid being positive he was quite certain that it was a case of enteric fever and necessary medicines were administered. The patient responded to the medicines as long as she was under the care and treatment of the appellant.

The judgment of Forward Construction Company and others (supra) referred to by the learned Advocate for the respondents deal with the principles of *res judicata*. It has been strenuously submitted by the learned Advocate for the respondent that the appellant had filed three writ petitions on the self-same cause of action. This appeal arises out of the third writ petition filed by the appellant. It has been mentioned earlier that the first writ petition was filed praying for expeditious disposal of the appeal filed by the appellant against the impugned order of

the WBMC. The second writ had been filed as the appeal preferred by the appellant had not been disposed of within the time as specified by this Hon'ble Court on the first writ petition filed by the appellant. The present writ petition out of which this appeal arises had been filed challenging the order dated 7th December, 2017 passed by the Principal Secretary, Government of West Bengal, Family Welfare Department being the appellate authority of the WBMC. The order impugned in this writ petition was not in existence when the first and the second writ petitions were filed. Accordingly, the question of *res judicata* cannot and does not arise at all.

The judgment of Medical Council of India (supra) referred to by the learned Advocate of the respondent dealt with the vires of certain regulations of the Indian Medical Council (Professional Conduct Etiquette and Ethics) Regulation 2002 and the same has no matter of application in the present case. The judgment of Dr Shyama Prasad Sar (supra) clearly states that no provision for appeal can create a compulsion to lodge an appeal for a right, essentially a thing conferred, cannot be imposed nor is exhaustion of a statutory remedy of appeal a mandatory requirement for maintaining an application under Article 226 of the Constitution of India. Whether a petition under Article 226 should be entertained when a statutory remedy is not exhausted is to be examined on the facts and circumstances of the case concerned. It has been further held that in cases where it *prima facie* appears that the impugned order is vitiated by jurisdictional error or patent violation of the principles of national justice discretion can be exercised in favor of entertaining the petition.

In the instant case, it is evident from records available before this Court that there has been flagrant and **patent violation of the principles of natural justice, equity and fair play.**

Relegating the appellant to avail the statutory remedy would not in my opinion be the proper approach in the instant case. The prayer made by the learned Advocate appearing for the respondent for remanding the matter back to the trial court for hearing the same also does not hold good in the facts and circumstance in the instant case. The same will only entail in delay of the matter further. To avoid the same this Court vide order dated 23rd April, 2018 had admitted the appeal and directed that the appeal would be heard out on the papers of the stay petition and all formalities had been dispensed with. The parties have advanced exhaustive arguments for days together and remanding the matter back to the trial Court for deciding the same would result in valuable loss of judicial hours apart from causing immense harassment and mental agony, which the appellant is suffering since August 2017 when the order for removal of his name was passed by the WBMC. **No fruitful purpose will be served by remanding the matter to the learned trial Judge.** We have noted that out of the penalty period of 1 year imposed on 18/21 August, 2017 more than 10 months have already elapsed. Less than 2 months are left for the petitioner to serve the entire period of punishment of removal of his name from the register of medical practitioners. He has already suffered enough due to the erroneous decision of the WBMC.

It will not be out of place to mention that there was a direction for filing affidavit in opposition in the writ petition as far back as on 3rd January, 2018. We have been told that no affidavit had been filed in connection with the writ petition in terms of the direction passed by the learned trial Judge. In that view of the matter, this court vide order dated 23rd April, 2018 proposed to hear the appeal finally and dispose of the same on merits on the papers of the stay petition. It is pertinent to mention that the writ petition along with all annexures have been annexed with the application for stay. Going back to the charge memo it is seen that the WBMC charged the appellant for some errors on his part. **The Hon'ble Supreme Court in the case of Kusum Sharma (supra) reiterated the observation made by the Court in the case of Spring Meadows Hospital v. Harjol Ahluwalia, (1998) 4 SCC 39 that an error of judgment is not necessarily negligence.**

In the same case, the Court reiterates the observation made in the case of White House v. Jordan (1981) 1 WLR 246 that an **error of judgment may, or may not be negligent**, it depends on the nature of the error. If it is one that would not have been made by a reasonably competent professional man professing to have the standard and type of skill that the defendant holds himself out as having, and acting with ordinary care, then it is negligence. If, on the other hand, it is an error that such a man, acting with ordinary care, might have made, then it is not negligence.

In Achutrao Haribhau Khodwa v. State of Maharashtra (1996) 2 SCC 634 referred to in Kusum Sharma's case, the Supreme Court noticed that *"44. In the very nature of medical profession, skills differ from doctor to doctor and more than one alternative course of treatment is available, all admissible. Negligence cannot be attributed to a doctor so long as he is performing his duties to the best of his ability and with due care and caution.* ***Merely because the doctor chooses one course of action in preference to the other one available, he would not be liable if the course of***

action chosen by him was acceptable to the medical profession".

In Kusum Sharma, the Supreme Court reiterated the observation made in Jacob Mathew case that a doctor faced with an emergency ordinarily tries his best to redeem the patient out of his suffering. He does not gain anything by acting with negligence or by omitting to do an act. The Court goes on to observe that it is a matter of common knowledge that after happening of some unfortunate event, there is a marked tendency to look for a human factor to blame for an untoward event, a tendency which is closely linked with the desire to punish. Things have gone wrong and, therefore, somebody must be found to answer for it. **A professional deserves total protection. It is to be kept in mind that to err is human**. Doctors may make errors of judgment but if they are punished for this then no doctor can practice his profession with a free mind. A doctor cannot perform with a sword hanging over his head. In a third world developing country like India with such huge population, limited resources, lack of proper infrastructural facilities and only a handful of doctors errors cannot be ruled out in its entirety. It is expected that the doctors would carry out their duty with utmost care and precision. But the doctor cannot be put to blame in each and every case when a mishap happens, and certainly not in this case. It is highly unfortunate that a girl lost her life at such a young age. The parents have lost their only child. May be the same doctor has saved the life of several other children. There are many patients who are desperately in need of medical assistance but due to dearth of medical professionals they have to suffer endlessly. It is the society at large who will suffer if the doctor is not allowed to practice for a certain period of time because the moment the penalty period is over the doctor will restart his practice and make up for his professional loss but the patient who remained without medical service may not get back the time to recover.

Decision

Applying the aforesaid principles laid down by the Hon'ble Supreme Court in the instant case, **it can be concluded that the act of the appellant certainly cannot be held as 'infamous conduct'**. The punishment of penalty in the absence of any specific charge is patently illegal and gross violation of the principles of natural justice, equity and fair play. **When two divergent and equally efficacious procedures for treatment was possible one by administrating two antibiotics and the other by administering lesser antibiotics adopting one would not amount to any error attracting the penalty of removal of the name of the appellant from the register of medical practitioners.**

The decision of the WBMC contained in memo bearing no. 3165-C/28-2011 dated 21st August, 2017 and the order dated 7th December, 2017 passed by the Principal Secretary, Health and Family Welfare Department and the Appellate Authority of WBMC **are set aside.** The WBMC is directed to re-enter the name of the appellant in the register of medical practitioners immediately without any delay and **preferably within a period of 48 hours from the date of receipt of a copy of this order.** The appellant is at liberty to resume practice forthwith.

The appeal is allowed. No costs.

(Amrita Sinha, J.)

■■■■

FDA Proposes New Regulations to Ensure Safety and Effectiveness of Sunscreens

The US FDA has proposed a rule that would update regulatory requirements for most sunscreen products in the United States. This significant action is aimed at bringing nonprescription, over-the-counter (OTC) sunscreens that are marketed without FDA-approved applications up to date with the latest science to better ensure consumers have access to safe and effective preventative sun care options. Among its provisions, the proposal addresses sunscreen active ingredient safety, dosage forms, and sun protection factor (SPF) and broad-spectrum requirements. It also proposes updates to how products are labeled to make it easier for consumers to identify key product information.

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CV OUTCOME OF CANAGLIFLOZIN

Dr Anirban Majumdar, Kolkata

- The CANVAS Program integrated data from two trials with a total of 10,142 participants with type 2 diabetes and high cardiovascular (CV) risk. The primary outcome was a composite of death from CV causes, nonfatal myocardial infarction (MI) or nonfatal stroke.
- The rate of the primary outcome was found to be lower with canagliflozin than with placebo (26.9 vs. 31.5 participants per 1,000 patient-years; hazard ratio [HR], 0.86; 95% confidence interval [CI], 0.75-0.97). Additionally, there was a lower risk of hospitalization for heart failure with canagliflozin.
- Thus, canagliflozin, compared to placebo, was associated with a lower frequency of adverse CV events.
- The US FDA has approved canagliflozin to reduce the risk of heart attack, stroke or CV death in adults with type 2 diabetes and established cardiovascular disease (CVD). Canagliflozin is now the only oral diabetes treatment approved to reduce the risk of these CV events.
- The lack of heterogeneity in results across countries, despite geographic variations in the use of specific sodium-glucose co-transporter 2 inhibitors (SGLT-2i), suggests a class effect of SGLT-2i. Initiation of canagliflozin in type 2 diabetes mellitus (T2DM) and with established CVD is associated with a lower risk of mortality, hospitalization for heart failure and major adverse cardiovascular events (MACE). Clinical trial results on canagliflozin are reproducible in broad general patient population.

DIABETES AND INFLAMMATION

Dr Mangesh Tiwaskar, Mumbai

The association between hyperglycemia and inflammation is well-established now. Antidiabetes drugs may alleviate inflammation by reducing hyperglycemia, but their role in inflammation is ambiguous. Recent data suggest that immunomodulatory treatments may have beneficial effects on glycemia, β-cell function and insulin resistance. Thiazolidinediones (TZDs) have the best proven anti-inflammatory mechanism of action. Hydroxychloroquine is studied extensively for its anti-inflammatory benefits in diabetes. Other anti-inflammatory agents have only limited data to support. Anti-TNF-∝, anti-IL-1β, salsalate, diacerein, etc., are also being researched for their beneficial effects. Further studies are required to clarify the role of anti-inflammatory therapy in the management of type 2 diabetes. Better understanding of inflammatory basis for diabetes may provide novel modalities for diabetes prevention and treatment.

ARTIFICIAL SWEETENERS: SWEET OR SOUR

Dr Madhukar Mittal, Lucknow

Sugar is said to be the "New Cigarette!"

India's domestic sugar requirement is estimated to touch record 30 million tons by the year 2020. Sugar contributes to anxiety, depression, hyperactivity; increases risk of blood clots, strokes, fatty deposits in the liver; causes diabetes, weight gain, kidney damage, headache and migraines and tooth decay. Artificial sweeteners are a major part of our diet. They have been extensively studied for their safety and only then approved for long-term consumption. They help in compliance of consumers who are advised not to take sugar in their diets and thus assist in management of diabetes and obesity. The US FDA has approved seven NNS (saccharine, aspartame, sucralose, neotame, acesulfame-K, stevia, monk fruit extract) for use in humans and has classified two of them under generally recognized as safe (GRAS) category. Artificial sweeteners are closely regulated and have passed the necessary checks to be used in foods. Most of them are not metabolized in the body and so are generally considered safe for consumption. When consumed by diabetics in daily acceptable limits, they can help in

limiting carbohydrate and energy intake as a tool to manage blood glucose and weight.

IMPACT OF VITAMIN D DEFICIENCY ACROSS LIFE STAGES: STRATEGIES TO OVERCOME THIS PUBLIC HEALTH PROBLEM

Maj Gen RK Marwaha (Rtd), Delhi

- Poor bone health is responsible for causation of 8.9 million fractures annually worldwide. Lifetime risk for hip, vertebral and wrist fracture is 30-40%. High morbidity and mortality are associated with osteoporotic fractures.
- Vitamin D maintains blood calcium level in normal range which is vital for normal functioning of nervous system, bone growth and achieving peak bone density.
- Adverse effects of vitamin D deficiency - *Children and adolescents:* Poor growth velocity; rickets; short stature; low bone mass; genu varum; genu valgum. *Adults and old age:* Muscle pain and fatigue; osteomalacia; osteoporosis; hip, spine, forearm and other fractures; possibly an increased prevalence of autoimmune disorders, CVDs, skin disorders, cancers and infections. *Deficiency/insufficiency in pregnancy and lactation*: Adverse maternal outcomes such as osteomalacia, pre-eclampsia and preterm deliveries; lower birth weight; lower crown heel length, head circumference and mid arm circumference; low bone mass; poor/delayed growth; rickets *in utero*/at birth; tetany; neonatal hypocalcemic seizures; abnormal enamel formation and dental caries.
- Dietary calcium intake is low in children and adults in India. Indian diets are predominantly vegetarian, based on cereals and legumes, and are deficient in milk and milk products. Low calcium content is further compromised by high levels of phytates in the vegetarian diets.
- A dose of 6,00,000 IU of vitamin D is effective in treatment of nutritional rickets. A one time intramuscular injection of vitamin D is equally efficacious in treatment of nutritional rickets as staggered administration of the same dose orally over a period of 10 weeks.
- Combination therapy with both vitamin D and calcium yields better healing of rickets than either modality alone. In the absence of vitamin D fortification of foods, diet alone appears to have an insignificant role.
- Physical activity and adequate sun exposure are vital for attaining peak bone mass in Indian context. Supplementing milk fortified with vitamin D to children is an effective and safe method of addressing the major public health issue of vitamin D deficiency in children.

POST-TRANSPLANT DIABETES: CURRENT UNDERSTANDINGS

Dr Debmalya Sanyal, Kolkata

Transplant patients may have pre-existing diabetes, develop post-transplant diabetes or transient post-op hyperglycemia. Post-transplant diabetes mellitus (PTDM) is common. It is associated with decreased patient and graft survival and increased CVD and infection. Risk stratification and intervention are required to minimize risk. Insulin secretion and sensitivity are impaired and need multifaceted management. Immunosuppressive medications may impair kidney function and dose adjustments of diabetes medications are often needed for this. Individualize glycemic targets according to prevalent comorbidities. There may be increased CVD risk with poorly tolerated hypoglycemia. Dipeptidyl peptidase-4 inhibitors (DPP-4i) and metformin can be given.

PREMIX INSULINS: EVIDENCE AND CLINICAL RELEVANCE

Dr Subhash Kumar Wangnoo, New Delhi

Premix insulins provide the convenience of having two variable acting insulins in the same dose. It enables the healthcare provider to address to fasting and postprandial sugar levels in the same shot. It provides a reasonably decent glycemic control, cuts down the number of insulin shots at the same time, providing a similar level of glycemic control.

ULTRAFAST-ACTING INSULINS: FUTURE DIRECTIONS AND CLINICAL POSSIBILITIES

Dr Antonio Ceriello, Milan, Italy

Ultrafast-acting insulins are rationally designed as a closer approach to the physiological mealtime insulin action. Faster acting insulin aspart is an ultrafast-acting insulin with an earlier onset of appearance and greater early insulin action than conventional insulin aspart. Fast-acting insulin aspart has demonstrated improvements in postprandial glucose (PPG) increments with reductions in the risk of nocturnal hypoglycemia.

MEDICAL NUTRITION THERAPY FOR DIABETES

Dr Vineet K Surana, New Delhi

Medical nutrition therapy (MNT) is a therapeutic approach to treating medical conditions and their associated symptoms through the use of a specifically tailored diet devised and monitored by healthcare professionals. Evidence shows adding MNT to be significant in preventing prediabetes and managing diagnosed diabetes. MNT also prevents or slows down the complications of diabetes: Reduction of 1% A1c in patients with newly diagnosed type 1 diabetes mellitus (T1DM); Reduction of about 2% A1c in persons with newly diagnosed T2DM; Medical supervision is necessary for the monitoring: Weight/BMI; glycemic parameters; metabolic parameters. MNT for prevention and treatment of T2DM and CVD has a broad range of benefits including satiety and weight stabilization; reduced low-grade inflammation; improved insulin sensitivity; improved glucose control; improved lipid profile; reduced risk of T2DM complications.

IMMUNE CHECK POINT INHIBITORS: ENDOCRINE CONSEQUENCES

Dr Anil Bhansali, Chandigarh

Evolution of immune check point inhibitors (ICPi) is a breakthrough in the management of metastatic carcinomas. ICPi include CTLA-4 inhibitor ipilimumab; PD-1 inhibitors and PDL-1 inhibitors. Recognition of endocrine complications following ICPi therapy requires a high index of suspicion. Thyroid dysfunction and hypophysitis are common endocrine consequences. Development of endocrine complications predicts favorable outcome. Those with pre-existing hypothyroidism may require increase in dose after initiation of ICPi therapy. Discontinuation of ICPi is not warranted unless patient is severely thyrotoxic.

DIABETIC FOOT AND INTENSIVE GLYCEMIC CONTROL

Dr Altamash Shaikh, Mumbai

Patients with type 2 diabetes are at increased risk of macro- and microvascular disease. In type 2 diabetes, intensive glycemic control has been associated with a reduction in the risk for lower-extremity amputation (LEA). Improved glycemic control seems to be a strong predictor of decreased risk for subsequent LEA. The Society for Vascular Surgery guidelines suggest that intensive glycemic control (A1c <7) should be targeted. TASC II guidelines suggest targeting an HbA1c goal of <7% (or as close to 6% as possible) in patients with concomitant diabetes and peripheral artery disease (PAD). Society for Vascular Surgery (SVS) suggests a goal of <6.5-7.

MANAGEMENT OF ADRENOCORTICAL CARCINOMA

Prof Gary D Hammer, USA

- Adrenal-focused imaging is recommended in all patients with suspected adrenocortical carcinoma (ACC).
- Histopathologic diagnosis and grading - Use of Weiss system is recommended. Ki67 immunohistochemistry is recommended for every adrenocortical tumor.
- In patients with advanced ACC at the time of diagnosis not qualifying for local treatment, either mitotane monotherapy or mitotane + EDP is recommended depending on prognostic parameters.
- Owing to the high rate of recurrence and metastatic disease, treatment often relies on systemic therapies.
- Cytotoxic therapy in unresectable ACC - EDP-M is recommended as first-line treatment for recurrence <6 months, rather than repeat locoregional measures. In patients who progress under mitotane, addition of EDP is recommended.
- It is recommended that adrenal surgery for suspected/confirmed ACC should be performed only by surgeon experienced in adrenal and oncological surgery.
- Complete en bloc resection is recommended.
- Open surgery is the standard surgical approach for confirmed or highly suspected ACC.
- It is suggested that routine locoregional lymphadenectomy should be performed.
- For adrenal tumors with uncertain malignant potential, adjuvant therapy is not recommended.
- There is a suggestion for adjuvant mitotane treatment without macroscopic residual tumor but with high risk of recurrence.
- Radiation can be considered in addition to mitotane therapy on an individualized basis therapy in patients with R1 or Rx resection or in stage III.
- Adjuvant chemotherapy can be considered in selected patients with very high risk for recurrence.

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Empower Diabetes Patient

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Metformin 250 mg Tablets, 500 mg & 850 mg Press Tablets

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Metformin SR 500 mg + Voglibose 0.2 mg + Glimepiride 1 mg / 2 mg Tablets

GLYCIPHAGE®-G 1mg 2mg
Metformin SR 500 mg + Glimepiride 1 mg / 2 mg

GLYCIPHAGE®-G 1mg 2mg FORTE
Metformin SR 1000 mg + Glimepiride 1 mg / 2 mg

Voliphage™ 0.2 mg / 0.3 mg
Voglibose 0.2 mg / 0.3 mg Tablets

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News and Views

Free Treatment to All Under 30 by 2022

By 2022, all people up to the age of 30 years will not only get free health check-ups but also free medical treatment, said Union Health Minister JP Nadda. He was in Gorakhpur to inaugurate the Guru Gorakhnath Nursing School and College recently. To attain that goal, he said, the government was transforming primary and community health centers into health wellness centers and more than 20,000 such centers had been made so far… (*ET Healthworld, February 11, 2019*)

Only One-third of Children Covered by Social Protection, Say ILO, UNICEF

Social protection is critical in helping children escape poverty and its devastating effects, yet, the vast majority of children have no effective social protection coverage, UNICEF and the ILO said in a joint report.

Evidence shows clearly that cash transfers play a vital role in breaking the vicious cycle of poverty and vulnerability. Yet, globally only 35% of children on average are covered by social protection which reaches 87% in Europe and Central Asia, 66% in the Americas, 28% in Asia and 16% in Africa. At the same time, one in five children lives in extreme poverty (less than US$ 1.90 a day), and almost half of the world's children live in 'moderate' poverty (under $3.10 a day). Almost everywhere, poverty disproportionately affects children, as they are twice as likely as adults to live in extreme poverty.

The report calls for the rapid expansion of child and family benefits, with the aim of achieving universal social protection for children, as well as the Sustainable Development Goals (SDGs). Such benefits are a key element of policies to improve access to nutrition, health and education, as well as reducing child labor and child poverty and vulnerability… (*UNICEF, February 6, 2019*)

Pregnancy may Increase Risk of Intracerebral Hemorrhage

Pregnancy confers a significantly higher risk of intracerebral hemorrhage (ICH) that peaks during the 3rd trimester and continues into early postpartum, suggests a study presented at the American Stroke Association's International Stroke Conference. Patients experiencing ICH during the postpartum period were more likely to be Black or Asian (compared to White), and had a history of hypertension, diabetes, coagulopathy, thrombocytopenia or substance abuse.

Mild TBI may Predispose to Mental Health Problems

Patients with mild traumatic brain injury (mTBI) are more likely to develop post-traumatic stress disorder (PTSD) or major depressive disorder (MDD) within 3-6 months after the injury, according to a new study published online January 30 in *JAMA Psychiatry*. Risk factors for probable PTSD at 6 months after mTBI included less education, being black, self-reported psychiatric history and injury resulting from assault or other violence. Risk factors for probable MDD after mTBI were similar except that cause of injury was not associated with increased risk.

Chronic Rhinosinusitis Associated with Increased Risk of Depression and Anxiety

A study from Korea says that chronic rhinosinusitis may increase the risk for depression and/or anxiety. Those who had chronic rhinosinusitis and nasal polyps were found to be at a higher risk for depression or anxiety than those without polyps. The study is published online February 7, 2019 in *JAMA Otolaryngology - Head and Neck Surgery*.

Shorter Course of Radiation Therapy Effective in Men with Prostate Cancer

According to a study published February 8, 2019 in *JAMA Network Open*, men with low- or intermediate-risk prostate cancer can safely undergo higher doses of radiation over a significantly shorter period of time (stereotactic body radiotherapy) and still have the same, successful outcomes as from a much longer course of treatment.

Atta Whole Wheat Flour and Maida Refined Wheat Flour, Says FSSAI

FSSAI, the country's apex food regulator, has directed FBOs (food business operators) to use the English nomenclature of whole wheat flour for atta and refined wheat flour for maida in the labeling of such products, where the same is used either singly or as an ingredient in the food items.

The order said that the use of the term wheat flour or whole wheat flour and refined flour, wherever used either singly or as an ingredient in food items, on the labels of packaged food products has been examined in detail and it was decided that atta should be labeled as whole wheat flour (atta) and maida should be labeled as refined wheat flour (maida), wherever the same is used singly or as an ingredient.

The order said, "It has been observed that FBOs are using the term wheat flour as the English nomenclature for maida on the label of the food products, which does not convey the exact nature of the ingredients used in the manufacturing of various food items to the consumers as well as enforcement officials."… "Food businesses have been directed to comply with the requirements by April 30, 2019. The state machinery has also been asked to ensure compliance with this order. No action shall be initiated against the FBOs until the time limit ends." … (*FSSAI*)

Extend Trial Shows Feasibility of Thrombolysis Beyond 4.5-hour Window in Selected Patients

Thrombolysis for acute ischemic stroke is currently restricted to 4.5 hours from onset. But, the results of the EXTEND trial presented at the American Heart Association International Stroke Conference (ISC) have shown that ischemic stroke patients with salvageable brain tissue presenting 4.5-9 hours from onset or with WUS who received alteplase achieved better functional outcomes, reperfusion and early neurological improvement. Mortality was comparable despite numerically more symptomatic intracerebral hemorrhage (sICH).

Children with Autism Spectrum Disorder Experience Poor Sleep Habits

Children with autism spectrum disorder, and those with other types of developmental delays who have symptoms of the disorder, often have a harder time getting to sleep and staying asleep, according a study published online February 11, 2019 in the journal *Pediatrics*.

Ultraprocessed Foods Increase Mortality Risk

Eating higher amounts of ultraprocessed foods increases mortality risk, according to a study published online February 11, 2019 in *JAMA Internal Medicine*. The risk for all-cause death increased by 14% for every 10% increase in the amount of dietary ultraprocessed foods consumed. Ultraprocessed foods include mass-produced, ready-to-eat foods such as packaged snacks, sugary drinks, breads, candies, ready-made meals and processed meats.

Managing Young Women at High Risk of Heart Disease: CMAJ

A new review based on the latest, high-quality evidence published from 2008 to 2018 published February 11, 2019 in *CMAJ* (*Canadian Medical Association Journal*) provides guidance for physicians to identify and manage premenopausal women at high risk of heart disease. Some key observations are:

- Diabetes, metabolic syndrome and smoking are stronger risk factors in younger women.
- Younger women with ovarian dysfunction may be at higher risk of cardiovascular disease.
- Early menopause because of surgical or chemical interventions may be a risk factor.
- Pregnancy complications, such as gestational hypertension and pre-eclampsia, are linked to higher risk of cardiovascular disease.

Updated ACCP Guidelines on Pulmonary Arterial Hypertension

The American College of Chest Physicians (CHEST) has published updates to the evidence-based guidelines on therapy for pulmonary arterial hypertension (PAH). The new guideline published in the journal *Chest* includes 78 evidence-based recommendations for appropriate use in treating patients with PAH. There are two new recommendations about pharmacologic therapy for PAH:

- For treatment-naive patients with PAH who are World Health Organization (WHO) functional Class II and III, initial combination therapy with ambrisentan and tadalafil to improve 6 minute walk distance (6MWD) is suggested.
- For stable or symptomatic patients with PAH on background therapy with ambrisentan, addition of tadalafil to improve 6MWD is suggested.

New WHO-ITU Standard Aims to Prevent Hearing Loss Among 1.1 Billion Young People

Nearly 50% of people aged 12-35 years – or 1.1 billion young people – are at risk of hearing loss due to prolonged and excessive exposure to loud sounds, including music they listen to through personal audio devices. The WHO and the International Telecommunication Union (ITU) have issued a new international standard for the manufacture and use of

these devices, which include smartphones and audio players, to make them safer for listening.

The "Safe listening devices and systems: A WHO-ITU standard" recommends that personal audio devices include:

- "Sound allowance" function: software that tracks the level and duration of the user's exposure to sound as a percentage used of a reference exposure.
- Personalized profile: an individualized listening profile, based on the user's listening practices, which informs the user of how safely (or not) he or she has been listening and gives cues for action based on this information.
- Volume limiting options: options to limit the volume, including automatic volume reduction and parental volume control.
- General information: information and guidance to users on safe listening practices, both through personal audio devices and for other leisure activities.

(WHO, February 12, 2019)

More than 9,000 Infected with Swine Flu Across the Country

Death toll across the country due to swine flu has soared to 312 according to data released by the Union Health Ministry. Over 9,000 persons have so far been affected by the H1N1 virus, with Rajasthan still topping the list with highest number of cases and deaths, according to the data. Swine flu has affected over 9,000 people in the country with Rajasthan reporting more than 100 deaths and nearly 2,941 cases of infects, followed by Gujarat at 55 deaths and 1,431 people being infected, showed the data. Punjab has reported 30 deaths and 335 cases, followed by Madhya Pradesh, which has reported 22 deaths and 98 cases … *(The Pioneer-PTI, February 11, 2019)*

BP Variability Indicative of Poor Prognosis Post-Stroke

According to a new study presented at the American Stroke Association's International Stroke Conference in Honolulu, patients with more variation in their systolic blood pressure (BP), the top number in the measurement, had a higher risk of death within 90 days.

Inexpensive Supplement for Women Increases Infant Birth Size

For women in resource-poor settings, taking a certain daily nutritional supplement before conception or in early pregnancy may provide enough of a boost to improve growth of the fetus, according to the multi-country Women First trial published February 5, 2019 in the *American Journal of Clinical Nutrition*. The supplement consists of dried skimmed milk, soybean and peanut extract blended into a peanut butter-like consistency. Weighing less than an ounce, the supplement is fortified with essential vitamins and minerals and provides protein and fatty acids often lacking in the women's diets.

Omadacycline Noninferior to Linezolid as Treatment of Acute Bacterial Skin and Skin-Structure Infections

Omadacycline, an aminomethylcycline antibiotic, was noninferior to linezolid for the treatment of acute bacterial skin and skin-structure infections in terms of clinical response and had a similar safety profile, according to a study published February 7, 2019 in the *New England Journal of Medicine*.

Radiolabeled PSMA-targeted Treatment Improves Survival in Men with Metastatic Prostate Cancer

A single-arm, phase II trial in men with PSMA-positive metastatic, castration-resistant prostate cancer (mCRPC) that progressed despite standard therapies, found that in the majority of men, the cancers were responsive to treatment with a novel, targeted radiation therapy called Lutetium-177 PSMA-617 (LuPSMA). Men receiving the medication lived a median of 13.3 months after treatment, longer than the average 9-month survival time for men with this stage of disease.

Exposures to Drug-resistant Brucellosis in the US Linked to Raw Milk

The Centers for Disease Control and Prevention (CDC) and state health officials are investigating potential exposures to Brucella strain RB51 (RB51) in 19 states, connected to consuming raw (unpasteurized) milk from Miller's Biodiversity Farm in Quarryville, Pennsylvania. One case of RB51 infection (brucellosis) has been confirmed in New York, and an unknown number of people may have been exposed to RB51 from drinking the milk from this farm. This type of Brucella is resistant to first-line drugs and can be difficult to diagnose because of limited testing options and the fact that early brucellosis symptoms are similar to those of more common illnesses like flu.

The New York case is the third known instance of an infection with RB51 associated with consuming raw milk or raw milk products produced in the United

States. The other two human cases occurred in October 2017 in New Jersey and in August 2017 in Texas … (*CDC, February 8, 2019*)

USPSTF Recommends Counseling for Women at High Risk of Perinatal Depression

The US Preventive Services Task Force (USPSTF) has recommended that clinicians provide or refer pregnant and postpartum women who are at increased risk of perinatal depression to counseling interventions (B recommendation) in a final recommendation statement published in *JAMA*, online February 12, 2019.

Pembrolizumab + Axitinib Improves Overall Survival and Progression-free Survival in Metastatic Renal Cell Carcinoma

Results from the randomized, phase III KEYNOTE-426 clinical trial show that first-line therapy with a combination of the PD-1 targeted immunotherapy pembrolizumab and the VEGF-targeted tyrosine kinase inhibitor axitinib extended both overall survival and progression-free survival for patients with clear-cell metastatic renal cell carcinoma (mRCC), compared with the current standard of care, sunitinib. The symposium is already over.

Hearing Impairment Associated with Greater Risk of Cognitive Decline

Hearing impairment is associated with accelerated cognitive decline with age, though the impact of mild hearing loss may be lessened by higher education, according to a study published in the February 12, 2019 issue of the *Journal of Gerontology: Series A Medical Sciences*. Those with more serious hearing impairment showed worse performance at the initial visit on the Mini-Mental State Exam (MMSE) and the Trail-Making Test, Part B.

Patients with Hidradenitis Suppurativa at a Greater Risk of Developing Lymphoma

Patients with hidradenitis suppurativa (HS) are at a greater risk of developing lymphoma compared to those who do not have HS. The prevalence of non-Hodgkin lymphoma (NHL) was 0.40% among individuals with and 0.35% among those without HS; the prevalences of Hodgkin lymphoma (HL) were 0.17% vs. 0.09%, respectively and the prevalences of cutaneous T-cell lymphoma (CTCL) were 0.06% vs. 0.02%. These findings were published online in *JAMA Dermatology*.

PumpStart: Teaching CPR to High School Students

In a study reported in the *Journal of Education*, participants in the PumpStart program showed significant improvements in CPR technique and confidence in acquired skills for both the pilot semester (31% vs. 82%, $p < 0.05$) and first year implementation (33% vs. 86%, $p< 0.05$). Medical students reported significantly higher confidence levels regarding abilities to answer questions about CPR, serving as mentors and facilitating training sessions for new medical students after participating in PumpStart.

PumpStart, a community service-learning program developed by medical students, was formed to increase education on compression-only CPR to local high school students and foster leadership and mentorship skills in participating medical students.

Measles Cases Nearly Doubled in a Year, Says WHO

A projected near-doubling of measles infections has been identified amid rising severe and protracted outbreaks all over the planet, in poor and rich countries alike, the WHO said.

The appeal to Member States to close gaps in vaccine coverage follows the previously announced news that an estimated 1,10,000 people died from the highly infectious but easily preventable disease in 2017. "Measles is not going anywhere…It's everyone's responsibility," said Dr Katherine O'Brien, Director of Immunization, Vaccines and Biologicals at WHO. "For one person infected, up to 9 or 10 people could catch the virus."

The WHO alert follows its announcement that as of mid-January this year, it had seen 2,29,068 reported cases of measles during 2018, in 183 Member States, which have until April to file data on the previous year's disease burden. This is almost double the 1,15,117 cases reported at the same point last year, and WHO's concern is based on the fact that the final number of infections rose to 173,330… (*February 14, 2019*)

Latest PAHO "Basic Indicators" Show NCDs as the Main Cause of Death in the Americas

The Americas region is home to more than 1 billion people. Every year, 15 million babies are born and nearly 7 million people die. Life expectancy is 80.2 years for women and 74.6 for men. More than 8 in 10 people live in urban areas. These are some of the key statistics presented in the new "2018 Basic Indicators," published by the Pan American Health Organization (*PAHO*).

The compendium, produced annually, presents PAHO's most recent data from 49 countries and territories on the demographic and socioeconomic situation of the Americas, the population's health status, risk factors and coverage of health care services and health systems. Noncommunicable diseases—such as heart disease, cancer, and stroke—are the main causes of death in the Americas. Regionwide, the death rate from noncommunicable diseases is 427.6 people per 1,00,000 population, which is seven times higher than the death rate from communicable (infectious) diseases, at 59.9 people per 1,00,000 population. … (*PAHO, February 13, 2019*)

Glyphosate Herbicide Linked to Non-Hodgkin Lymphoma

Exposure to Glyphosate, a commonly used herbicide, has been found to increase the risk of non-Hodgkin lymphoma (NHL) by 41% in a new meta-analysis by researchers from the University of Washington. The study is published online February 10, 2019 in *Mutation Research/Reviews in Mutation Research*.

First Interoperable Insulin Pump that Allows Patients to Customize Treatment Through their Individual Diabetes Management Devices Gets FDA Go Ahead

The US Food and Drug Administration (FDA) has permitted marketing of the Tandem Diabetes Care t:Slim X2 insulin pump with interoperable technology (interoperable t:Slim X2) for delivering insulin under the skin for children and adults with diabetes. This new type of insulin pump, referred to as an alternate controller enabled (ACE) infusion pump, or ACE insulin pump, is the first interoperable pump, meaning it can be used with different components that make up diabetes therapy systems, allowing patients to tailor their diabetes management to their individual device preferences.

Cognition Declines with Chronic Inflammation in Middle Age

According to a new study published in the February 13, 2019, online issue of *Neurology*, people who have chronic inflammation in middle-age may develop problems with thinking and memory in the decades leading up to old age. Those with the highest levels of inflammation biomarkers had an 8% steeper decline in thinking and memory skills over the course of the study than the group with the lowest levels of inflammation biomarkers.

Low Cardiorespiratory Fitness + Obesity in Adolescents Increases their Likelihood of Future Chronic Disability

Low cardiorespiratory fitness, obesity and the combination of the two in adolescence were strongly associated with chronic disability due to a wide range of diseases and causes in adulthood, says a study published online February 12, 2019 in the *Annals of Internal Medicine*.

Advisory Issued Against Retinal Disease Drug

Vitreo Retina Society-India (VRSI), a body of superspecialty doctors in ophthalmology, has issued a country-wide advisory against the use of ranibizumab an injectable drug manufactured by Ahmedabad based Intas Pharmaceuticals Limited, used for treating retinal vascular disease. The VRSI alert was issued on February 9, after 11-odd patients reported adverse reactions like inflammation in eyes. Sources confirmed the company has issued a directive to over 20 hospitals not to dispense a particular batch of ranibizumab injections… (*ET Healthworld, February 15, 2019*)

ICMR Launches Web-based Tool for Data Recording of Patients Suffering from Cleft Lip

The Indian Council of Medical Research (ICMR), in collaboration with the AIIMS launched "IndiCleft", a web-based tool which will help in online and offline data recording of patients suffering from cleft lip or cleft palate.

The robust web-based recording system, which has been developed with the help of the National Informatics Centre (NIC), enhanced with more server space and improved capabilities at ICMR Headquarters, was launched by ICMR Director General Dr Balram Bhargava. IndiCleft is a comprehensive aid for cleft patients covering important components broadly grouped under 10 headings -- demographic, socioeconomic, maternal history, surgical history, dental history, surgical and post-surgical evaluation, ENT evaluation, speech assessment, genetic evaluation and lastly, dental evaluation, Dr OP Kharbanda, the chief of Centre for Dental Education and Research (CDER) at the AIIMS said … (*Business Stndard-PTI, Feb/14,2019*)

Burnout is a Significant Issue for Doctors Globally, Finds Medscape Report

Burnout and depression are a significant issue for doctors, says the Medscape Global Physicians' Burnout and Lifestyle Comparisons 2019 Report, which surveyed nearly 20,000 doctors in six countries (France, Germany,

Portugal, Spain, United States and United Kingdom); 37% feel burned out and 10% experience both burnout and depression. Burnout was most common in Spain and Portugal. While depression alone was higher in Germany (24%), German doctors were burned out less often than in other countries. Reasons for burnout were given as bureaucratic tasks (paperwork, charts), long working days, lacking respect from employers/administrators/staff/colleagues… (*Medscape*)

OSA Patients with Excessive Daytime Sleepiness at Greatest Risk of Cardiovascular Disease

Adults with obstructive sleep apnea (OSA) who experience excessive sleepiness while awake are at far greater risk for cardiovascular diseases than those without excessive daytime sleepiness, according to new research published online in the *American Journal of Respiratory and Critical Care Medicine*. They were three times as likely to have been diagnosed with heart failure at enrolment and twice as likely to experience a cardiovascular event (heart attack, heart failure, stroke or cardiovascular death) during the follow-up period.

Decolonization Reduces Post-discharge Infection Risk Among MRSA Carriers

Results of the Changing Lives by Eradicating Antibiotic Resistance (CLEAR) trial show that post-discharge methicillin-resistant *Staphylococcus aureus* (MRSA) decolonization with chlorhexidine and mupirocin led to a 30% lower risk of MRSA infection than education alone in patients colonized with MRSA. The study is published in the *New England Journal of Medicine*, February 14, 2019.

Lithium is Safe and Tolerable as Maintenance Therapy for Children with Bipolar Disorder

A trial published in the February 2019 issue of the *Journal of the American Academy of Child and Adolescent Psychiatry* has supported the role of lithium as a maintenance treatment up to 28 weeks in children with bipolar I disorder. Participants who received lithium had a significantly lower relative risk for study discontinuation than those who received placebo.

FDA Approves Triclabendazole for Fascioliasis

The US FDA has approved triclabendazole to treat fascioliasis, a neglected tropical disease, in patients aged 6 years or older. Fascioliasis or liver fluke infestation is a water-borne and food-borne zoonotic disease caused by two species of parasitic flatworms.

Oral Complications Rare in Older Women on Anti-osteoporosis Treatment

Oral complications such as osteonecrosis of the jaw (ONJ) are rare in women taking medications for postmenopausal osteoporosis, according to a study published in the *Journal of Clinical Endocrinology & Metabolism*. Researchers used data from the 7-2 year FREEDOM Extension trial to assess information on oral procedures and cases of ONJ in women taking denosumab for postmenopausal osteoporosis. They found 45% of patients had at least one invasive dental procedure, but the overall rate of ONJ was low.

Cardiac Abnormalities Present in Patients with Alzheimer's Disease

ECG and echocardiographic abnormalities, including diastolic dysfunction, are present in patients with Alzheimer's disease and that these studies reproduce the pattern of cardiac amyloidosis, suggests a study published online in the February 2018 issue of *JACC Heart Failure*. These findings indicate that there may be subclinical cardiac involvement in Alzheimer's disease, which is probably associated with deposition of Aβ amyloid.

Five Dermatologic Emergencies to Know

Recognizing the signs of potentially fatal skin emergencies and knowing when to call for a dermatology consult can save lives. These emergencies will be discussed at Society of Hospital Medicine Annual Meeting 2019 to be held in March. The five dermatologic emergencies that physicians should know are:

- Stevens Johnson syndrome
- Drug Rash with Eosinophilia and Systemic Symptoms (DRESS) syndrome
- Purpura fulminans
- Acute Generalized Exanthematous Pustulosis (AGEP)
- Pyoderma gangrenosum.

Darolutamide Improves Metastasis-free Survival in Nonmetastatic, Castration-resistant Prostate Cancer

Among men with nonmetastatic, castration-resistant prostate cancer, metastasis-free survival was significantly longer with darolutamide, an androgen receptor antagonist, than with placebo. The incidence of adverse events was similar for darolutamide and placebo. These findings were published February 14, 2019 in the *New England Journal of Medicine*.

e-AUSHADHI Portal for Online Licensing System of Ayush Medicines Launched

Minister of State (IC) for AYUSH, Shri Shripad Yesso Naik, launched the e-AUSHADHI portal, for online licensing of Ayurveda, Siddha, Unani and Homoeopathy drugs and related matters at New Delhi. Addressing the gathering, Shri Naik said that this e-AUSHADHI portal is intended for increased transparency, improved information management facility, improved data usability and increased accountability. This new e-portal is an acronym for Ayurveda, Unani, Siddha and Homeopathy Automated Drug Help Initiative. … (*PIB, Ayush, Feb 13, 2019*)

16 Crore Indians Consume Alcohol: Survey

At the national level, about 14.6% (16 crore) people (in the 10-75 age group) consume alcohol, with Chhattisgarh, Tripura, Punjab, Arunachal Pradesh and Goa having the highest prevalence of liquor use, a recent government survey has found.

After alcohol, cannabis and opioids are the next commonly used substances in the country, the survey has found. Among those dependent on alcohol, one in 38 reported some form of treatment, while one in 180 reported getting in-patient treatment or hospitalization.

Conducted by the Social Justice and Empowerment Ministry in collaboration with the All India Institute of Medical Sciences (AIIMS), the survey titled "Prevalence and Extent of Substance Use in India" was conducted in all the 36 states and Union territories.

At the national level, 2,00,111 households were visited in 186 districts and a total of 4,73,569 individuals were interviewed, the report stated.

About 2.8% of Indians (around 3.1 crore) reported having used some cannabis product in the last 12 months.

At the national level, the most commonly used opioid is heroine (used by 1.14% of the people surveyed), followed by pharmaceutical opioids (used by 0.96% of the people surveyed) and opium (used by 0.52% of the people surveyed). About 1.08% (around 1.18 crore) of Indians in the 10-75 age group use sedatives (non-medical, non-prescription use).

At the national level, an estimated 4.6 lakh children and 18 lakh adults need help for inhaler use, the survey found.

Global Conference Calls for Action to Prevent Suffering and Disability from Mycetoma

Delegates attending the Sixth International Conference on Mycetoma in Khartoum, Sudan have endorsed a "Call for action" urging the global community to work together with multilateral agencies, partners, research institutions and pharmaceutical companies to address the devastating consequences of this disease.

Mycetoma, a neglected tropical disease, mainly affects poor, rural populations, particularly people of low economic status who walk barefoot and manual workers, such as agricultural laborers and herdsmen… (*WHO, February 15, 2019*)

Providing Follow-up Care after Heart Attack Helps Reduce Readmissions and Deaths

A program designed to help heart attack patients with the transition from hospital to outpatient care can reduce readmissions and deaths and increase the number of patients keeping follow-up appointments, as per a new study presented at the American College of Cardiology's Cardiovascular Summit in Orlando. The 30-day readmission rate before the program started was 6.3% and fell to 3.7% the year after the program began. There was a reduction in the 30-day death rate (5.75% before vs. 4.57% after program implementation) and an increase in patients' follow-up appointments made prior to discharge (78% vs. 96%).

Outcomes Post-laparoscopic Gastrectomy Comparable to Open Surgery

Patients with stage I gastric cancer who undergo laparoscopic distal gastrectomy have long-term-survival rates similar to those who have open distal gastrectomy, according to a study published online February 7, 2019 in *JAMA Oncology*.

Communication with Patients may Impact Outcomes in Management of Hypertension

In a survey of providers working in small primary care practices, use of communication techniques such as active listening, was associated with a higher proportion of patients who kept their BP under control, compared with clinicians who did not use these methods, according to a study published online February 8, 2019 in *Family Practice*.

■■■■

Why are Most Temples Located in Faraway Places?

KK AGGARWAL

Most temples represent God or the spirit or the deity located in the temple or mandir situated in an area at the outskirts of the city. A spiritual atmosphere is one that is devoid of pollution and which promotes rajasik or tamasik behavior. The silence of the spiritual atmosphere reduces the internal noise and helps us onward in our inner journey. The inner journey of being in touch with one's consciousness requires detachment from worldly pleasures and the withdrawal of the five senses of the body.

To be in touch with one's consciousness, one needs to bypass the disturbed state of consciousness controlled by emotion, memories and desires, through mind, intellect and ego. This usually requires a prolonged period of persistence and undertaking the inward journey devoid of external stimuli. The parikrama, which means "the path surrounding something", incorporating many long walks helps to detoxify the mind and thus shifts the consciousness from a disturbed state to an undisturbed, calm state.

A long walk not only offers physical benefits but one also gets the benefits of nature as one's inner stimuli are exposed to the outer stimuli during the parikrama. The person is often required to walk barefoot on natural ground, inhale pure air and concentrate and listen to the sounds of the nature, birds and trees. This proximity to nature helps in the inward spiritual journey and shifts one from the sympathetic to parasympathetic mode described by lowering of blood pressure and pulse rate. The final happiness invariably comes from within us at the time of final darshan when a person invariably closes his eyes and experiences God within his heart.

Most temples today are being constructed in residential colonies and provide a holy atmosphere to people right at their doorstep. However, they do not have the same spiritual significance and benefits as a temple located at the outskirts of a city.

There is no way a person can go to a temple in the vicinity of his house and detoxify his mind as this can hardly be achieved in minutes unless you are a siddha yogi, and if you are one, you need not go to a temple as the temple is within you.

In Vedic texts, it has been clearly mentioned that to acquire powers and inner happiness, rishi, munis had to do tapasya for months and years together. This tells us that spiritual well-being is acquired over an extended period of time as the process of detoxification is a long drawn process. Cars and other vehicles should not be allowed near temples as the basic motive is to have a pollution-free atmosphere and to give time and space for the mind to detoxify.

Group Editor-in-Chief, IJCP Group

■■■■

Back-scratch Test

- Assesses upper body (shoulder) flexibility, important in tasks such as combing one's hair, putting on overhead garments and reaching for a seat belt.
- Method: With one hand reaching over the shoulder and one up the middle of the back, measure the the number of inches (cm) between extended middle fingers (+ or -).
- Result: How closely hands can be brought together behind the back, indicates shoulder flexibility. Men: Minus (-) 4 inches or more, Women: Minus (-) 2 inches or more.

INSPIRATIONAL STORY

Live and Work

Father was a hardworking man who delivered bread as a living to support his wife and three children. He spent all his evenings after work attending classes, hoping to improve himself so that he could one day find a better paying job. Except for Sundays, Father hardly ate a meal together with his family. He worked and studied very hard because he wanted to provide his family with the best money could buy.

Whenever the family complained that he was not spending enough time with them, he reasoned that he was doing all this for them. But he often yearned to spend more time with his family. The day came when the examination results were announced. To his joy, Father passed, and with distinctions too! Soon after, he was offered a good job as a senior supervisor which paid handsomely.

Like a dream come true, Father could now afford to provide his family with life's little luxuries like nice clothing, fine food and vacation abroad. However, the family still did not get to see father for most of the week. He continued to work very hard, hoping to be promoted to the position of manager. In fact, to make himself a worthily candidate for the promotion, he enrolled for another course in the Open University.

Again, whenever the family complained that he was not spending enough time with them, he reasoned that he was doing all this for them. But he often yearned to spend more time with his family.

Father's hard work paid off and he was promoted. Jubilantly, he decided to hire a maid to relieve his wife from her domestic tasks. He also felt that their three-room flat was no longer big enough, it would be nice for his family to be able to enjoy the facilities and comfort of a condominium. Having experienced the rewards of his hard work many times before, Father resolved to further his studies and work at being promoted again. The family still did not get to see much of him. In fact, sometimes Father had to work on Sundays entertaining clients. Again, whenever the family complained that he was not spending enough time with them, he reasoned that he was doing all this for them. But he often yearned to spend more time with his family.

As expected, Father's hard work paid off again and he bought a beautiful condominium overlooking the coast of Singapore. On the first Sunday evening at their new home, Father declared to his family that he decided not to take anymore courses or pursue any more promotions. From then on he was going to devote more time to his family.

Father did not wake up the next day.

■■■■

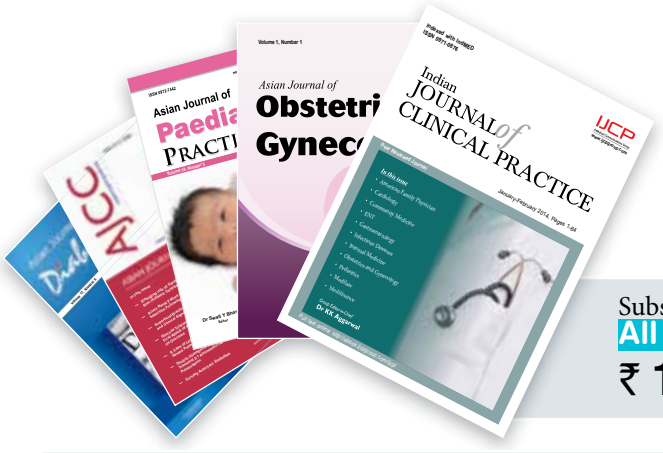
Pregnant and Nursing Women can Now be Given Ebola Vaccine, Says WHO

Reversing an earlier decision, the WHO now recommends vaccinating pregnant and breastfeeding women against the Ebola virus. The announcement was issued from Beijing after a consultation meeting by the Strategic Advisory Group of Experts (SAGE) on Immunization, which the WHO Director-General established in 1999 to provide guidance on the UN health agency's work.

Noting that these experimental vaccines are "non-replicating or replication deficient," SAGE concluded that "pregnant and lactating women should be included into the clinical trial protocol."

"The protocol must include provisions for safety monitoring and for documentation of EVD cases among vaccines, including follow-up of pregnant women and their offspring," the Group stressed.

According to SAGE, national authorities should choose the vaccine "based on a transparent and evidence-based process." (*UN, February 21, 2019*)



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Lighter Side of Medicine

HUMOR

INTERNS ARE SPECIAL

Intern: I want to divorce my wife.

Lawyer: On what grounds?

Intern: She's out all night, every night, going from bar to bar.

Lawyer: Are you saying she is alcoholic or do you think she's cheating on you…??

Intern: No, She's looking for me.

WALL OF CHINA

Wall of China is the wonder of the world!

Answer: It's the only thing made in China that lasted years.

MISTAKE

If a barber makes a mistake, it's a new style.

If a politician makes a mistake, it's a new law.

If a scientist makes a mistake, it's a new invention.

If a tailor makes a mistake, it's a new style.

If a teacher makes a mistake, it's a new theory.

But, if a student makes a mistake, it's Mistake.

STOP THEIR LIES

Doctor says milk gives strength, I drank 4 cups and couldn't move a wall.

But when I took 4 bottles of beer, I saw the wall moving itself.

These scientists should better stop their lies.

MORE WORDS

A husband looking through the paper came upon a study that said women use more words than men. It read, "Men use about 15,000 words per day, but women use 30,000." Excited to prove to his wife that he had been right all along when he accused her of talking too much, he showed her the study results. The wife thought for a while, then finally she said to her husband, "It's because we have to repeat everything we say." The husband said "What?"

WHATS THE BIG DEAL?

The phone bill was exceptionally high. Man called a family meeting to discuss.

Dad: This is unacceptable. I don't use home phone, I use my work phone.

Mum: Me too. I hardly use home phone. I use my company phone.

Son: I use my office mobile, I never use the home phone.

All of them shocked and together look at the maid who is patiently listening to them.

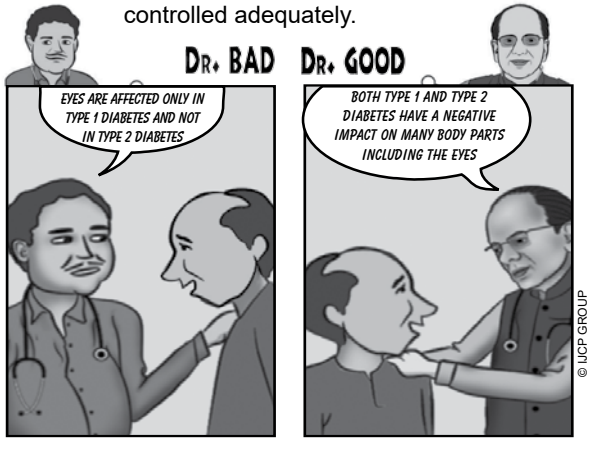
Maid: "What? So we all use our work phones. What's the big deal?

SPRING FEVER

Four high school boys afflicted with spring fever skipped morning classes. After lunch they reported to the teacher that they had a flat tire. Much to their relief she smiled and said, "Well, you missed a test today so take seats apart from one another and take out a piece of paper." Still smiling, she waited for them to sit down. Then she said: "First Question: Which tire was flat?"

Dr. Good and Dr. Bad

SITUATION: A man with type 2 diabetes was told that diabetes may affect various body parts including eyes and kidney in the future, especially if the glycemic levels are not controlled adequately.



LESSON: Both type 1 and type 2 diabetes are known to exert adverse effects on multiple organs.

J Clin Endocrinol Metab. 2017;102(12):4343-410.

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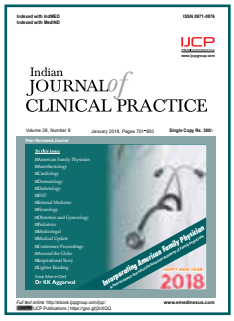

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Paintal AS. Impulses in vagal afferent fibres from specific pulmonary deflation receptors. The response of those receptors to phenylguanide, potato S-hydroxytryptamine and their role in respiratory and cardiovascular reflexes. Q. J. Expt. Physiol. 1955;40:89-111.

Books

Stansfield AG. Lymph Node Biopsy Interpretation Churchill Livingstone, New York 1985.

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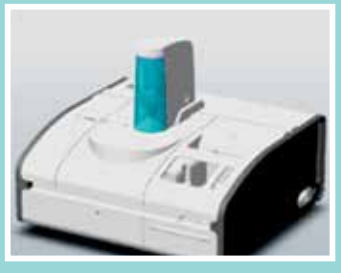

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