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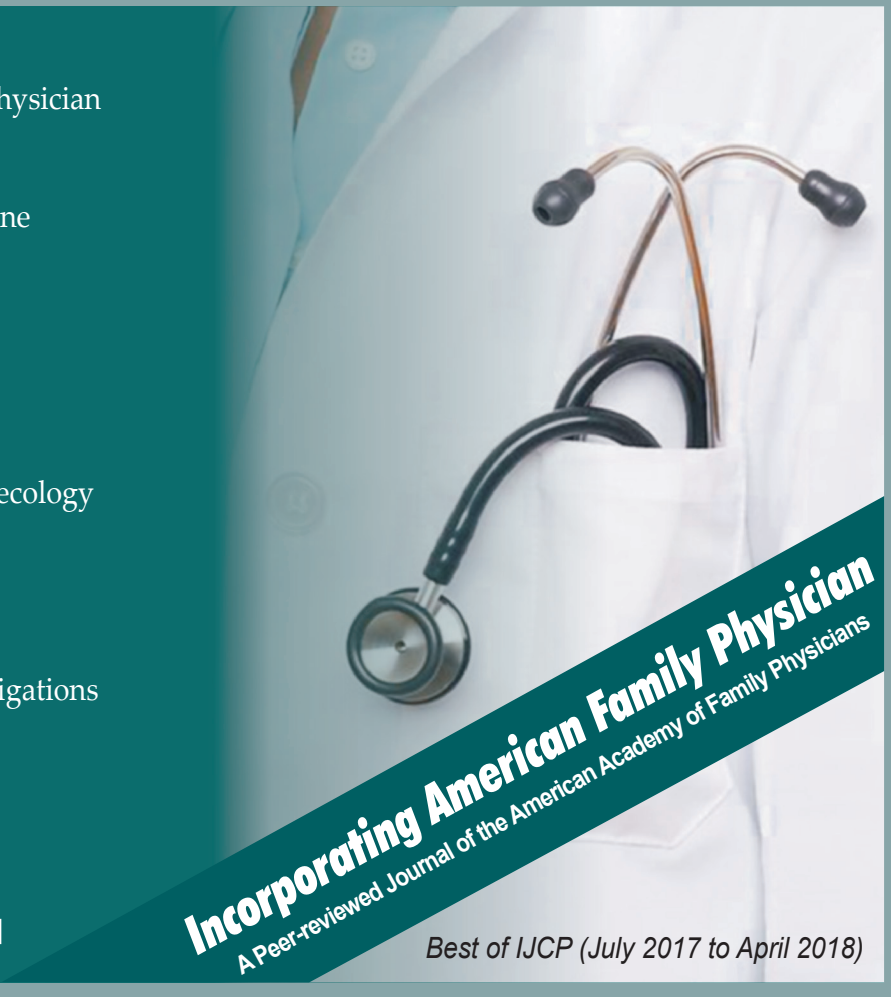

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MBBS Doctor can Admit Patients Under Him/Herself

The provisions of Section 15 of Indian Medical Council Act, 1956 deals with right of persons possessing qualifications in the schedules to be enrolled which is reproduced hereunder:

"(15) (1) Subject to the other provisions contained in this Act, the medical qualifications included in the Schedules shall be sufficient qualification for enrolment on any State Medical Register.

(2) Save as provided in Section 25, no person other than a medical practitioner enrolled on a State Medical Register:-

(a) shall hold office as physician or surgeon or any other office (by whatever designation called) in Government or in any institution maintained by a local or other authority;

(b) shall practice medicine in any State;

(c) shall be entitled to sign or authenticate a medical or fitness certificate or any other certificate required by any law to be signed or authenticated by a duly qualified medical practitioner:

(d) shall be entitled to give evidence at any inquest or in any court of law as an expert under Section 45 of the Indian Evidence Act, 1872 on any matter relating to medicine.

(3) Any person who acts in contravention of any provision of sub-section (2) shall be punished with imprisonment for a term which may extend to one year or with fine which may extend to one thousand rupees, or with both;"

Also, the Indian Medical Council (Professional Conduct, Etiquette & Ethics) Regulation, 2002 enumerates the duties and responsibilities of Physician in general. The provisions of Regulation 1 of the Indian Medical Council (Professional Conduct, Etiquette & Ethics) Regulations, 2002 are reproduced hereunder:

"B. Duties and responsibilities of the Physician in general:

1.1 Character of Physician *(Doctors with qualification of MBBS or MBBS with post graduate degree/diploma or with equivalent qualification in any medical discipline):*

1.1.1 *A physician shall uphold the dignity and honour of his profession.*

1.1.2 *The prime object of the medical profession is to render service to humanity; reward or financial gain is a subordinate consideration. Who-so-ever chooses his profession, assumes the obligation to conduct himself in accordance with its ideals. A physician should be an upright man, instructed in the art of healings. He shall keep himself pure in character and be diligent in caring for the sick; he should be modest, sober, patient, prompt in discharging his duty without anxiety; conducting himself with propriety in his profession and in all the actions of his life.*

1.1.3 *No person other than a doctor having qualification recognised by Medical Council of India and registered with Medical Council of India/State Medical Council(s) is allowed to practice Modern*

System of Medicine or Surgery. A person obtaining qualification in any other system of Medicine is not allowed to practice Modern System of Medicine in any form.

1.3: Maintenance of medical records:

1.3.1 Every physician shall maintain the medical records pertaining to his/her indoor patients for a period of 3 years *from the date of commencement of the treatment in a standard proforma laid down by the Medical Council of India and attached as Appendix 3.*

1.3.2. *If any request is made for medical records either by the patients/authorised attendant or legal authorities involved, the same may be duly acknowledged and documents shall be issued within the period of 72 hours.*

1.3.3 *A Registered medical practitioner shall maintain a Register of Medical Certificates giving full details of certificates issued. When issuing a medical certificate he/she shall always enter the identification marks of the patient and keep a copy of the certificate. He/She shall not omit to record the signature and/or thumb mark, address and at least one identification mark of the patient on the medical certificates or report. The medical certificate shall be prepared as in Appendix 2.*

1.3.4 *Efforts shall be made to computerise medical records for quick retrieval."*

Further, as per the Schedules of Indian Medical Council Act, 1956 the qualification in MBBS is a recognised qualification and the person who undertakes the MBBS qualification is entitled to be registered as registered medical practitioner practicing modern system of medicine as per the provisions of Indian Medical Council Act, 1956. Further, the provisions of Indian Medical Council (Professional Conduct, Etiquette & Ethics) Regulations, 2002 enumerates the code of ethics to be observed by physician who is a doctor with qualification of MBBS or MBBS with post graduate degree/diploma or with equivalent qualification in any medical discipline. Thus, once a person has obtained a degree in MBBS and is registered under the Indian Medical Council Act, 1956, then he/she is entitled to practice the modern system of medicine.

Also, as per the provisions of Section 15 of the Indian Medical Council Act, 1956 the registered medical practitioner has a right to sign, issue and authenticate medical or fitness certificate or other certificates to his/her patient.

Also, as per the provisions of Indian Medical Council (Professional Conduct, Etiquette & Ethics) Regulations, 2002 the physical is required to maintain the medical records of his/her indoor patients. The indoor patients are those patients who have been admitted by the physician for treatment.

Hence, a patient can be admitted under the physician who is a qualified MBBS doctor and who has been registered with the Indian Medical Council or any State Medical Council for treatment of the patient as admission of a patient is essential for treatment of the patient which is the paramount duty of the registered medical practitioner.

As per the provisions of Regulation 1.4.2 of Indian Medical Council (Professional Conduct, Etiquette & Ethics) Regulation, 2002 the physician shall display as suffix to their names only recognised medical degrees or such certificates/diplomas and memberships/honours which confer professional knowledge or recognises any exemplary qualifications/achievements. Thus, the MBBS cannot claim himself specialist.

Further, in the matter tilted as "Surinder Kumar (Laddi) versus Dr Santosh Menon & Others, 2000 (III) CPJ 517 (Punj. SCDRC), the Hon'ble Punjab State Consumer Disputes Redressal Commission held that MBBS doctor having obtained degree from the University was competent to practice medicines, surgery and obstetrics. Caesarean operation is a part of surgery. It may be that the persons obtaining diploma like DGO may be more qualified to conduct Caesarean operation but it cannot be said that such persons who had obtained such training only were eligible to conduct Caesarean operation. Further, doctor was qualified as well as eligible for conducting Caesarean operation, on the basis of her experience also.

Thus, the MBBS doctor can admit patients.

■■■■

AMERICAN FAMILY PHYSICIAN

Prevention and Treatment of Drowning

TIMOTHY F. MOTT, KELLY M. LATIMER

ABSTRACT

Nearly 4,000 drowning deaths occur annually in the United States, with drowning representing the most common injury-related cause of death in children one to four years of age. Drowning is a process that runs the spectrum from brief entry of liquid into the airways with subsequent clearance and only minor temporary injury, to the prolonged presence of fluid in the lungs leading to lung dysfunction, hypoxia, neurologic and cardiac abnormalities, and death. The World Health Organization has defined drowning as "the process of experiencing respiratory impairment from submersion/immersion in liquid." Terms such as near, wet, dry, passive, active, secondary, and silent drowning should no longer be used because they are confusing and hinder proper categorization and management. The American Heart Association's Revised Utstein Drowning Form and treatment guidelines are important in guiding care, disposition, and prognosis. Prompt resuscitation at the scene after a shorter duration of submersion is associated with better outcomes. Because cardiac arrhythmias due to drowning are almost exclusively caused by hypoxia, the resuscitation order prioritizes airway and breathing before compressions. Prevention remains the best treatment. Education, swimming and water safety lessons, and proper pool fencing are the interventions with the highest level of current evidence, especially in children two to four years of age. Alcohol use during water activities dramatically increases the risk of drowning; therefore, abstinence is recommended for all participants and supervisors.

Keywords: Drowning, WHO, respiratory impairment, floatable swimming aids

Drowning kills nearly 4,000 persons in the United States and more than 300,000 persons worldwide every year.[1] For U.S. children between one and four years of age, drowning has surpassed motor vehicle crashes as the most common injury-related cause of death at 2.6 per 100,000 persons annually.[2] Despite this significant health burden, public health initiatives have lagged because of lack of standardization in definitions and reporting.

DEFINITION

Before the first World Congress on Drowning (WCOD) in 2002, public health surveillance, research, and policy on drowning were impeded by a lack of clear terminology.[3] Highlighting this problem, a systematic review of the literature from 1966 to 2002 found at least 33 different definitions for drowning incidents.[4] The WCOD was organized largely to remedy this issue. The WCOD developed consensus guidelines using the Utstein principles—a term coined from a series of meetings held at Utstein Abbey in Stavanger, Norway, to clarify the nomenclature associated with out-of-hospital cardiac arrests.[4] The guidelines applied the same principles to clarify definitions, terminology, and data sets used in the epidemiology and treatment of drowning.[5] Following extensive discussion and debate, the World Health Organization agreed on the following definition: "Drowning is the process of experiencing respiratory impairment from submersion/immersion in liquid."[3]

Terms such as near, wet, dry, passive, active, secondary, and silent drowning should not be used because they can be confusing and ultimately hinder classification or management.[3] The Utstein approach simplified the classification of drowning outcomes to only three domains: death, morbidity, and no morbidity.[3]

EPIDEMIOLOGY

Despite declines in the death and hospitalization rates from drowning over the past decade, it remains the top injury-related concern in children.[2,6,7] Approximately 5,800 persons are treated in U.S. emergency departments each year for submersion or drowning injuries, with one-half of those patients requiring hospital admission.[6,8,9]

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Source: Adapted from Am Fam Physician. 2016;93(7):576-582.

Permanent neurologic sequelae, such as persistent vegetative state or spastic quadriplegia, occur in 5% to 10% of childhood drowning cases.[10]

The typical location of drowning varies depending on age. Children younger than four years are more likely to drown in a swimming pool, whereas adults are more likely to drown in a natural body of water (Figure 1).[6] A systematic review found drowning to be the most common cause of recreational aquatic activity death in persons 15 years or older; 30% to 70% of drowning fatality victims had alcohol in their bloodstream.[11] Even small amounts of alcohol increase the risk of drowning, and this risk increases with the amount of alcohol consumed.[10-13]

PATHOPHYSIOLOGY AND CLINICAL PRESENTATION

Understanding the drowning process bolsters accurate diagnosis, treatment, and prognosis. Initially, fluid enters the oropharynx and is cleared, if possible. If clearing is not possible, conscious breath holding ensues. Eventually, the internal drive to inspire becomes insurmountable, and fluid enters the airways, stimulating cough or laryngospasm. If the drowning process continues, a number of events may occur, such as fluid and electrolyte shifts, alveolar dysfunction, and hypoxia.[14,15] These may trigger further deterioration with pulmonary edema, decreased lung compliance, and bronchospasm.[14,15] Cardiac deterioration develops after seconds to minutes of hypoxia, typically progressing from tachycardia to bradycardia, pulseless electrical activity, and asystole.[15-17]

EVALUATION AND TREATMENT

The Utstein approach to the evaluation of drowning victims not only standardizes reporting and data collection but also provides guidance for the history, physical examination, and appropriate management (eFigure A).

History

Details of the drowning event guide treatment and determine prognosis. Younger patients tend to have better outcomes.[18] Submersion for six minutes or longer is associated with a significantly poorer prognosis. When considering open water drowning victims with good outcomes (i.e., did not die or experience severe neurologic sequelae), 88% were submerged less than six minutes vs. 7.4% of victims with six to 10 minutes of submersion.[18] In-water resuscitation, where several rescue breaths are given by trained lifesaving personnel while still in the water, is associated with shorter duration of anoxia and a higher rate of survival.[19] Lack of adequate training, openwater conditions, distance to shore, water depth, equipment availability (e.g., flotation devices), and a person's features (e.g., injury, obesity) may limit the feasibility of in-water resuscitation.[19]

Cold water submersion was previously considered neuroprotective because of decreased metabolic demands of hypothermia and the diving reflex. Case reports described young victims with prolonged submersion in very cold water who survived neurologically intact.[20,21] However, it has been determined that water temperature has no correlation with overall outcome.[18] Contrary to popular belief, fresh vs. saltwater aspiration makes no difference in the degree of lung injury.[15]

Unless the victim has experienced a diving or boating accident or has fallen from a height, cervical spine immobilization is unnecessary because only 0.5% of drowning victims have a cervical spine injury.[22]

Physical Examination and Initial Treatment

A drowning classification system has been established to classify victims at the rescue scene based on the clinical parameters of respirations, pulse, pulmonary auscultation, and blood pressure[14,17] (Figure 2[17]).

Attention to airway, breathing, and compressions (ABC) in that order (compared with the modern advanced cardiac life support guidelines' compressions, airway, and breathing [CAB]) is paramount because any cardiac arrhythmias are almost exclusively secondary to hypoxia.[23] A patient who is not breathing or has a Glasgow Coma Scale score less than 8 should be intubated and given ventilatory support.[14] Conscious drowning victims with rales in some or all pulmonary lung fields require supplementary oxygen and evaluation in the emergency department.[14,17] A victim who is still on the scene, has no other medical complications, and demonstrates clear lung fields (with or without a cough) does not automatically require further medical attention.[14,17] This represents more than 94% of lifeguard rescues.[14,17]

Vomiting occurs in 30% to 85% of drowning victims because of swallowing large amounts of water and positive pressure ventilation during resuscitation.[19,24] Aspiration of gastric contents portends worse lung injury.

Diagnostic Evaluation

Although certain diagnostic evaluations start at the scene and may progress to an emergency department,

Revised Utstein Drowning Data Form

Patient ID:

Gender: ☐ M ☐ F ☐ U

Age:_____

or date of birth:_____/_____/_____
DD/MM/YY

Date of event:_____/_____/_____
DD/MM/YY

Times:

Call received:_____

EMS resus:_____

Location of drowning:

☐ Bucket ☐ Toilet
☐ Bathtub ☐ Lake
☐ Ocean ☐ Pool
☐ River/flowing water ☐ Other

Event witnessed?

☐ Yes ☐ No

If yes, time of event:_____

Witnessed/monitored by:_____

☐ Layperson ☐ Healthcare personnel

Precipitating event known?

☐ Yes ☐ No

If yes: ☐ Intoxication ☐ Trauma

Pre-existing medical:

List:_____

Drugs: _____

Other: _____

At scene:

Loss of consciousness: ☐ Yes ☐ No

CPR before EMS: ☐ Yes ☐ No

☐ By layperson ☐ Healthcare personnel

Techniques used:

☐ Rescue breathing ☐ Chest compression

EMS assessment/management:

Spont breathing: ☐ Yes ☐ No ☐ U

Signs of circulation: ☐ Yes ☐ No ☐ U

Airway interventions: ☐ Yes ☐ No ☐ U

Initial neuro state: GCS: E____V____M____

or: ☐ A ☐ V ☐ P ☐ U

or: ☐ A ☐ B ☐ C

ED assessment/management:

Spont breathing: ☐ Yes ☐ No ☐ U

Palpable pulse: ☐ Yes ☐ No ☐ U

Tracheal tube/ventilation: ☐ Yes ☐ No ☐ U

Initial: temp____BP____RR____SpO_2____FiO_2

Initial neuro state: GCS: E____V____M____

Or: ☐ A ☐ V ☐ P ☐ U

Or: ☐ A ☐ B ☐ C

Outcome:

ROSC:

Any: ☐ Yes ☐ No ☐ U

> 20 min: ☐ Yes ☐ No ☐ U

DNAR order: ☐ Yes ☐ No ☐ U

Date of event:_____/_____/_____
DD/MM/YY

Survived to:

ICU/ED: ☐ Yes ☐ No ☐ U

Hospital admission: ☐ Yes ☐ No ☐ U

Hospital discharge: ☐ Yes ☐ No ☐ U

If discharged alive: ☐ CPC ☐ U

Conn Drowning Coma Scale: A = Alert; B = Blunted; C = Comatose. GCS: E = Eye opening; V = Verbal response; M = Motor response.
AVPU scale: A = Alert or awake; V = Response to voice; P = Response to pain only; U = Unarousable

eFigure A. Revised Utstein drowning data form.

BP = Blood pressure; CPC = Cerebral performance category; CPR = Cardiopulmonary resuscitation; DNAR = Do not attempt resuscitation; ED = Emergency department; EMS = Emergency medical services; FiO_2 = Fraction of inspired oxygen; GCS = Glasgow Coma Scale; ICU = Intensive care unit; ROSC = Return of spontaneous circulation; RR = Respiratory rate; SpO_2 = Arterial oxygen saturation; U = Unknown.

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the overall breadth of diagnostic workup is limited and primarily focuses on respiratory function. If hypothermia is a concern, infrared thermometric devices should not be used to determine core temperature because they register falsely lower body temperatures in victims whose heads have been submerged.[25] On arrival to the emergency department, clinical impression should guide laboratory studies. Serum electrolyte, hemoglobin, and hematocrit levels are typically in normal ranges and measurement is not beneficial.[17,26]

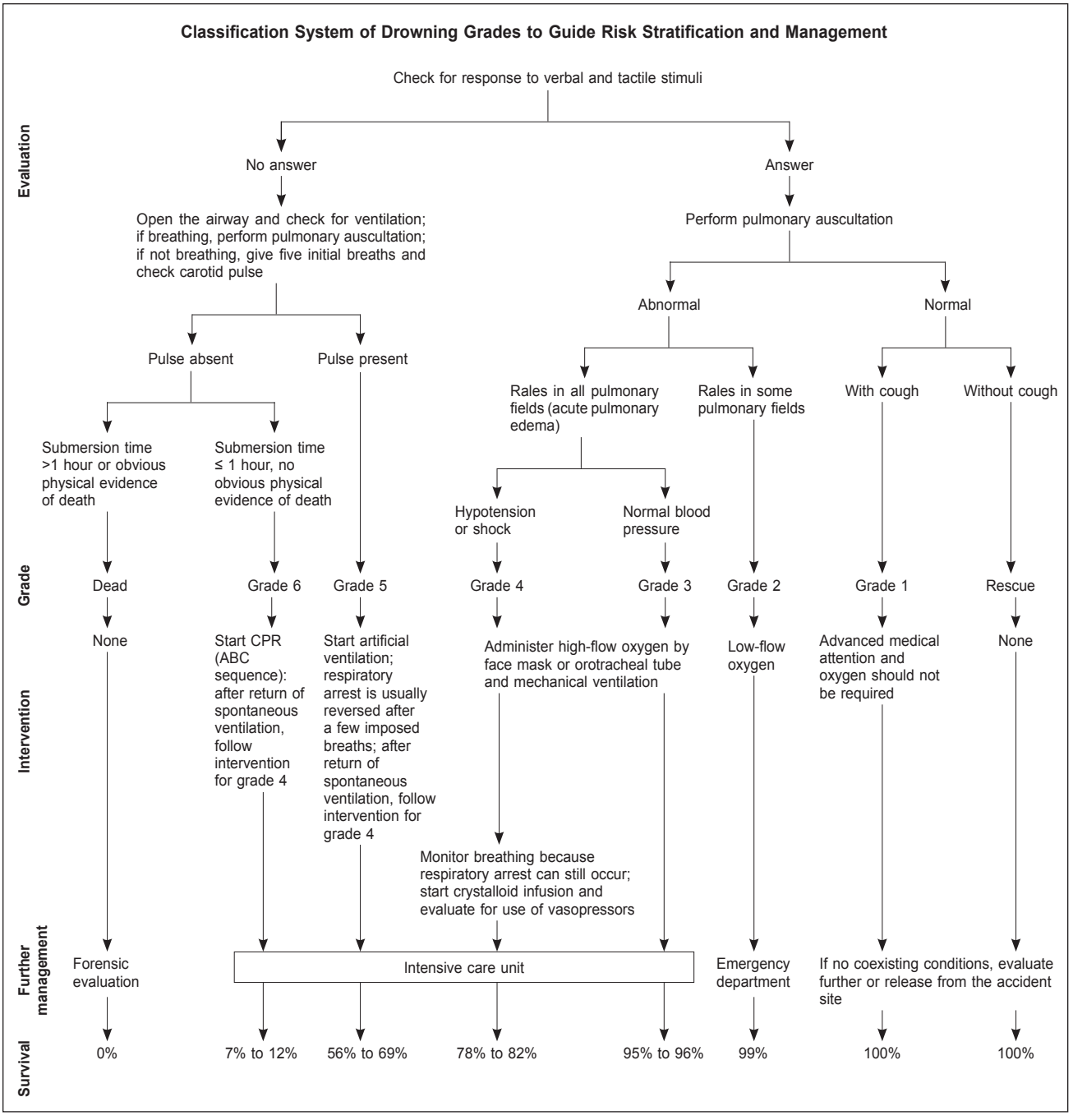

Figure 2. Classification system of drowning grades to guide risk stratification and management.

ABC = Airway, breathing, and compressions; CPR = Cardiopulmonary resuscitation.

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An initial chest radiograph may be unremarkable even if significant lung injury has occurred, or, conversely, pneumonia may be overdiagnosed because of water in the lungs.[27,28] Drowning victims with suspected head or neck trauma should undergo computed tomography of the head and cervical spine.[22] For drowning victims in cardiac arrest, a nonshockable rhythm (asystole or pulseless electrical activity) is more common than in nondrowning cardiac arrest victims.[16]

PREVENTION

Drowning is rarely caused by a single factor; therefore, prevention strategies should not be pursued in isolation.[12] Prevention methods target

Table 1. Drowning Prevention Methods

Method	Comments
Physical	
Pools	
Fencing	Odds ratio for drowning in a fenced vs. an unfenced pool = 0.27 (95% confidence interval, 0.16 to 0.47)[29]
	Four-sided fencing completely surrounding pool (not attached to house on one side)
	Gates should open away from the pool, be self-closing and self-latching, with the latching mechanism at least 58 inches above the ground
	Fence composition should not be climbable (e.g., not chain link)
	Fence should be at least 4 feet high with no more than 4 inches between vertical aspects and no more than 4 inches between the bottom of the fence and the ground
Drain covers, safety vacuum release systems, multiple drains to displace pressure	Prevents entrapment and entanglement of hair or body parts; other filter techniques that provide pressure venting should be implemented
Rescue equipment	U.S. Coast Guard–approved water rescue equipment (such as a reaching pole or shepherd's crook and life buoys) should be readily available poolside, in addition to a working telephone
Pool alarms (multiple types, such as floating, subsurface, and wristband alarms)	No evidence that alarms are of benefit; may provide a false sense of security; not a substitute for adequate supervision or adequate pool fencing
Personal flotation devices	According to a 2008 report from the U.S. Coast Guard, 91% of drowning victims (464 of 510) were not wearing personal flotation devices[31]
	There is little evidence on effectiveness, but use likely decreases morbidity and mortality; proper use is based on the individual and the setting
	See U.S. Coast Guard guidelines at http://www.uscg.mil/hq/cg5/cg5214/pfdselection.asp
Floatable swimming aids	Not approved as personal flotation devices; do not replace adequate supervision Air-containing types can deflate
Bath stands	Drownings associated with bath stand use were caused by product defect in < 10% of cases[33]
	May give caregivers the false perception that the infant needs less attention; cannot substitute for adequate direct supervision
Behavioral	
Avoid alcohol use	30% to 70% of adults who die from drowning have positive blood alcohol levels[11]
	Discourage the use of alcohol or other drugs for all boaters and participants in water recreation
	Adults supervising children should not be using alcohol or drugs
CPR	Immediate on-the-scene care is important for survival
	All adults and caregivers should be trained in CPR and understand the rationale for using the ABC order of resuscitation (not the CAB order)
Supervision	
Lifeguards	Encourage use of water recreation areas staffed by lifeguards with certification in CPR
Adults/caregivers	Knowledge of CPR should be mandatory for supervising children
	Direct supervision should be employed with any age swimmer; adult "water watchers" should avoid distracting activities
	Touch supervision must take place with nonswimmers; adult should be in the pool and within arm's reach of nonswimmer at all times

Continues…

…Continued

Table 1. Drowning Prevention Methods

Method	Comments
Avoid rip currents	Learn characteristics of rip currents (e.g., reverse bubbles moving away from beach, broken waves between sandbars)
	Encourage use of beaches with lifeguards and heed warnings of posted surf conditions
	To escape, do not battle current; swim perpendicular to current (parallel to shore) until cleared from rip current and then swim at an angle, away from the current and toward the shore
	For safety tips about rip currents, see http://www.ripcurrents.noaa.gov/
Open bodies of water and other natural swim areas	
Approach water with an unknown depth and/or hazards with caution	Even in clear water, depths may be uncertain, so entering feet first the first time is advised
Assess for currents	Swift currents can trap persons underneath rocks, trees, or other debris, and can overwhelm even strong swimmers
Standing water	
Monitor water-containing objects	Buckets, inflatable pools, and natural standing water should never be left unattended; buckets and inflatable pools should be emptied when not in use
	Restrict toddlers' access to bathrooms and toilets with childproof latching systems
Education	
Swimming and water safety lessons	Possibly effective in children two to four years of age
	American Academy of Pediatrics supports swimming lessons for children four years and older
Medical	
Monitor children with seizure disorders	Children with seizure disorders should always have direct supervision when swimming or bathing
	Showering is preferable to bathing when supervision cannot take place because of privacy concerns
Monitor children with autism spectrum disorder and cardiac channelopathies (long QT syndrome and catecholaminergic polymorphic ventricular tachycardia)	There is slight evidence that children with these disorders have increased rates of drowning and thus may require increased supervision
Community/government	
Office-based interventions	Can be implemented by physicians and support staff
	Identify families with access to residential pools for targeted drowning prevention counseling
	Ensure adequate counseling and support services for drowning victims
Legislation to prevent drowning	Safe pool fencing
	Proper staffing of pools or public swimming areas with CPR-certified lifeguards
	Strict boating laws regarding alcohol consumption
Drowning awareness campaigns; educational materials	CPR training
	Swimming lessons
	Drowning prevention techniques

ABC = Airway, breathing, and compressions; CAB = Compressions, airway, and breathing; CPR = Cardiopulmonary resuscitation.

Information from references 10 through 13, 17, and 29 through 33.

the aforementioned epidemiologic concerns and can be divided into physical, behavioral, medical, and community/government areas of interest (Table 1[10-13,17,29-33]). Although rigorous studies with high-level evidence are lacking, there is some evidence supporting educational programs, swimming and water safety lessons, and pool fencing in the prevention of drowning, especially in children two to four years of age.[12,13,29] Residential pool safety measures are highlighted by the American Academy of Family Physicians in its clinical policy statement at http://www.aafp.org/about/policies/all/residential-pool.html. With adequate supervision, swimming instruction, and public education measures, it is estimated that 85% of drownings can be prevented.[30]

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

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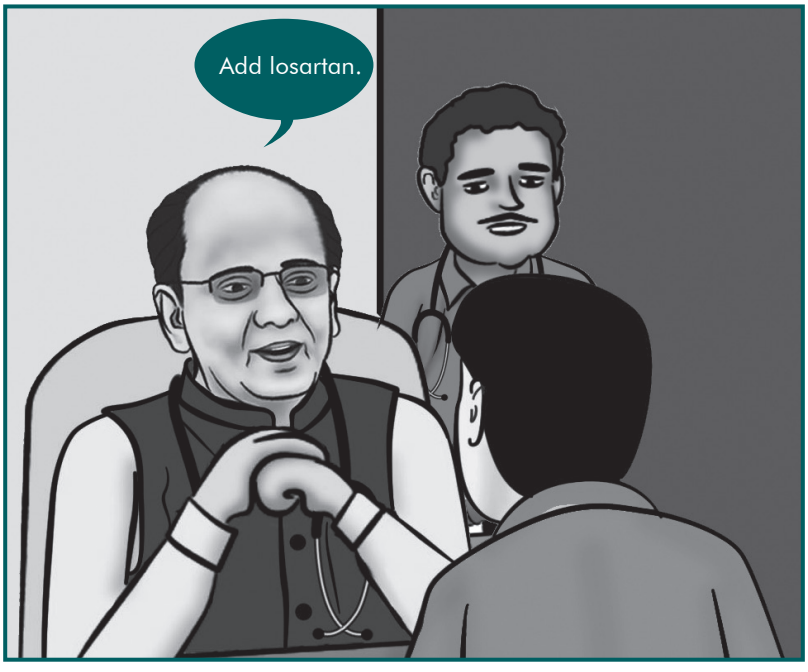
SITUATION: A hypertensive patient with long-standing type 2 diabetes on a calcium channel blocker was found to have moderately increased albuminuria (between 30 and 300 mg/day).



LESSON: In the RENAAL (Reduction of Endpoints in NIDDM with the Angiotensin II Antagonist Losartan) study in patients with type 2 diabetes already receiving conventional antihypertensive therapy, the use of the ARB losartan significantly decreased the risk of end-stage renal disease. Losartan also significantly decreased the degree of proteinuria.

N Engl J Med. 2001;345(12):861-9.

To Deduce Optimal Fentanyl Infusion Dose for Effective Analgesia with Minimal Side Effects and Maximum Hemodynamic Stability

ANUJ MALIK*, GAURAV GUPTA†, KAMAL BAGDI*, RANJEET SINGH VIRK‡, UMA RATHI‡

ABSTRACT

Objective: To deduce optimal fentanyl infusion dose for effective analgesia with minimal side effects and maximum hemodynamic stability. **Material and methods:** In our prospective study, comparing the three groups (of 30 patients each) namely group 2, 3, 4 receiving three different doses of fentanyl (20 μg, 30 μg, 40 μg), respectively along with control group (Group 1) receiving conventional analgesics through intramuscular or intravenous route. Effective analgesia rated on linear visual analog scale (VAS) with minimum side effects and most stable hemodynamic parameters. **Results:** The VAS scores, at rest, were significantly lower for epidural fentanyl groups as compared to control group. Mean blood pressure and pulse rate in all groups were comparable at all times. The incidence of side effects was similar in the three groups as compared to control group. **Conclusion:** Fentanyl dose of 40 μg is thus the optimal epidural dose of background infusion along with patient on demand analgesia in terms of maximum analgesic efficacy, maximum hemodynamic stability and minimum side effects in patients undergoing unilateral total knee replacement.

Keywords: Fentanyl infusion, analgesia, optimal dose, unilateral total knee replacement

"The greatest evil is physical pain" —Saint Augustine

Adequate relief of postoperative pain is the cornerstone of any acute pain management service in the modern era. Introduction of new pain management standards by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and recognition of the untoward consequences of uncontrolled postoperative pain have led to a greater appreciation for the importance of acute postoperative pain control. Inadequate control of postoperative pain may result in a higher incidence of chronic postsurgical pain, increased postoperative morbidities and worsened patient-oriented outcomes such as quality-of-life.

In the past postoperative pain experienced by patients was treated conventionally with boluses of intramuscular or intravenous analgesics either on demand or at fixed intervals, which provided inadequate analgesia for inappropriate length of time. These two routes are least desirable because while intramuscular route is painful, both routes produce unpredictable blood levels due to erratic absorption. Patient dissatisfaction is common because of delays in drug administration and incorrect dosing. Cycles of sedation, analgesia and inadequate analgesia are common.

After knee surgery, poorly managed pain may inhibit the early ability to mobilize the knee joint. This, in turn, may result in adhesions, capsular contracture and muscle atrophy, all of which may delay or permanently impair the ultimate functional outcome, increased complications and diminished patient oriented outcomes such as quality-of-life and satisfaction. Early mobilization results in shorter hospital stay and cost containment and better resource utilization.

Postoperative epidural analgesia has been used in orthopedic surgeries and reported to expedite the achievements in postoperative rehabilitative milestones, reduce postoperative morbidity and decrease the length of hospital stay, compared with general anesthesia.

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Since, there is lack of availability of sufficient data on "dose response" studies done with epidural fentanyl and a lack of consensus on its efficacy as compared to the traditional analgesic modalities, we planned this study to compare the analgesic effects of various doses of epidural fentanyl (background infusion) along with "on demand" boluses to determine the "optimal dose" postoperatively in patients undergoing unilateral total knee replacement.

MATERIAL AND METHODS

After obtaining informed consent from each and every patient, 120 (American Society of Anesthesiologists [ASA] physical status I or II) patients of either sex, scheduled for elective unilateral knee replacement were enrolled in the study. Their age ranged from 20 to 70 years.

Adult patients who were to undergo unilateral total knee replacement under spinal anesthesia were divided randomly into four groups of 30 patients each for the purpose of this study. Patients were randomly assigned to one of the four groups to receive either none (Group 1 receiving traditional intravenous or intramuscular analgesics referred to as "control" group) or 20 μg/hr (Group 2), 30 μg/hr (Group 3), 40 μg/hr (Group 4) dose of background epidural fentanyl infusion along with "on demand" dose of 20 μg fentanyl.

Combined spinal epidural set: The combined spinal epidural set consisted of

- Sponge holding forceps
- Sterile gauze pieces
- Sterile towel
- Glass syringe (10 and 20 mL)
- Epidural Kit
- Spinal needle 26G
- Sterile dressing.

Visual Analog Scale

The linear visual analog scale (VAS) was used to assess the pain and pain relief of the patients. It consists of a straight line with 0.5 cm segments. One end having a mark 'O' represented "no pain" and the other having mark '10' represented "worst imaginable pain".

Interpretation of the VAS was explained to each and every patient during pre-anesthetic check-up and was explained for the second time after surgery in the recovery room before starting the background infusion of fentanyl. It was thus ascertained that every patient is able to aptly correlate his pain and accurately report it when asked about the same. The surgery was performed under spinal anesthesia. In the postoperative recovery room, before starting the individual background infusion, return of active toe movements was confirmed.

Any "breakthrough pain" before the return of active toe movements was treated likewise with epidural bolus dose of 20 μg but the background infusion was started only after the return of active toe movements and on confirmation of catheter position. Patients experiencing severe breakthrough pain and requiring analgesia even after loading epidural dose of 20 μg fentanyl, before return of active toe movements were excluded from the study. All patients were monitored before starting infusion (0 hour) and for up to 36 hours at 4 hours, 8 hours, 12 hours, 24 hours and 36 hours (Table 2), respectively after starting epidural fentanyl infusion.

In the following parameters: Blood pressure, pulse rate, respiratory rate, SpO_2, pain (as per sedation score), nausea/vomiting (as per nausea, vomiting score), adverse effects (e.g., pruritus, skin allergy, urinary retention respiratory depression)- noted and treated with naloxone/ondansetron. The Duncan's mean test was used to compare the four groups of patents for demographic variables, hemodynamic parameters, VAS scores, analgesia quality, received demand doses and quantifying side effects each time of the study i.e., at 0, 4, 8, 12, 24, 36 hours, respectively. The data were compiled and analyzed to compare the analgesic efficacy of various doses of epidural fentanyl and to determine the optimal dose in terms of effective pain control, minimal number of additional demands made by patient, minimum sedation, maximum hemodynamic stability and minimum side effects.

OBSERVATION AND RESULTS

Hemodynamic parameters were in normal range during entire perioperative period and there was no serious concern.

The mean VAS in Group 1 was 3.62 ± 0.39, in Group 2 was 2.48 ± 0.34, in Group 3 was 1.42 ± 0.31 and in Group 4 was 0.97 ± 0.27. The difference of mean VAS was statistically significant in Group 1 vs. 2, Group 1 vs. 3, Group 1 vs. 4 (Table 1).

The analgesic efficacy in the four groups of patients at 0, 4, 8, 12, 24, 36 hours has been defined as (i) Excellent if mean VAS was between 0 to 3; (ii) Good if mean VAS between 4 to 6 and (iii) poor if mean VAS was between 7 to 10. This shows that there was significant reduction in pain score (VAS) as the background infusion dose of fentanyl increased from 20 μg/hr in Group 2 to 40 μg/hr in Group 4 (Table 2).

Table 1. VAS Score in the Groups 1 to 4

G-1 (n = 30)		G-2 (n = 30)		G-3 (n = 30)		G-4 (n = 30)		Significant pairs	F value
Mean	SD	Mean	SD	Mean	SD	Mean	SD		370.80
3.62	0.39	2.48	0.34	1.42	0.31	0.97	0.27	Gr2 vs. Gr1 Gr3 vs. Gr1 Gr4 vs. Gr1 Gr3 vs. Gr2 Gr4 vs. Gr2 Gr4 vs. Gr3	

Table 2. Analgesic Efficacy in the Four Groups of Patients at 0, 4, 8, 12, 24, 36 Hours

VAS Group	G-1 (n = 30)		G-2 (n = 30)		G-3 (n = 30)		G-4 (n = 30)		Significant pairs	F value
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
VAS0	2.10	0.60	1.83	0.38	1.80	0.61	1.86	0.62	-	1.73
VAS4	4.43	1.04	3.03	0.85	1.33	0.60	0.97	0.61	G4 vs. G1 G4 vs. G1 G3 vs. G2 G3 vs. G1 G2 vs. G1	121.08
VAS8	4.13	1.19	2.73	0.64	1.37	0.61	0.97	0.56	G4 vs. G2 G4 vs. G1 G3 vs. G2 G3 vs. G1 G2 vs. G1	98.12
VAS12	4.23	0.81	2.80	0.76	1.46	0.73	0.80	0.66	G4 vs. G3 G4 vs. G2 G4 vs. G1 G3 vs. G2 G3 vs. G1	124.75
VAS24	3.60	0.72	2.33	0.54	1.37	0.67	0.60	0.56	G4 vs. G3 G4 vs. G2 G4 vs. G1 G3 vs. G2 G3 vs. G1 G2 vs. G1	126.74
VAS36	3.23	0.81	2.17	0.46	1.20	0.96	0.63	0.67	G4 vs. G3 G4 vs. G2 G4 vs. G1 G3 vs. G2 G3 vs. G1 G2 vs. G1	69.45

DISCUSSION

Postoperative pain is the most common form of pain encountered by the anesthesiologist. The associated morbidity and severity requires adequate management of postoperative pain. Besides the humanitarian cause, the effective management of postoperative pain is mandatory also for prevention of complications like nausea and vomiting, negative nitrogen balance, deep vein thrombosis, lung atelectasis and other respiratory complications. Ureteral and bladder hypomobility, which may delay recovery and prolong hospitalization.

When an opioid is administered to the chief site of action, the substantia gelatinosa of the dorsal horn, it produces a highly selective depressing action on nociceptive pathway in the rexed laminae of the dorsal horn without effecting motor sympathetic or proprioceptive pathways thus allowing pain relief without sympathetic or motor blockade.

The cardiovascular and hemodynamic effects of fentanyl have usually been relatively small and limited to minimal depression in the heart rate, blood pressure and right ventricular work with a compensatory increase in stroke volume.

The mean VAS in Group 1 was 3.62 ± 0.39, in Group 2 was 2.48 ± 0.34. There was no statistically significant difference in the mean VAS scores in the four groups at 0 hours. The mean VAS scores at 4, 8, 12, 24 and 36 hours post-fentanyl infusion along with on demand rescue analgesia were least in Group 4 followed by Group 3, 2 and 1. This shows the analgesic efficacy of 40 μg/hr fentanyl infusion dose in Group 4. Thus, in terms of analgesic efficacy 40 μg/hr epidural fentanyl dose is the 'optimal dose' along with 'on demand' 20 μg bolus dose of fentanyl. The analgesic efficacy of fentanyl can be attributed to supraspinal and spinal mechanisms.

The results support a segmental spinal effect of epidural fentanyl bolus administration and a nonsegmental dual spinal and supraspinal effect of epidural fentanyl infusion. They also provide evidence of clinical benefits from its predominant spinal action, notably improved analgesia, with a reduction in central side effects. The study thus provides support for a spinal mechanism of action of bolus administration of epidural fentanyl.

CONCLUSION

We thus conclude that epidural fentanyl dose of 40 μg/hr (Group 4) as "background infusion" is the most efficacious dose in terms of pain relief (analgesic efficacy) followed by 30 μg/hr (Group 3) and 20 μg/hr (Group 2), respectively along with patient's "on demand" rescue analgesia bolus dose of 20 μg in patients undergoing unilateral total knee replacement. Epidural fentanyl dose of 40 μg/hr is the "optimal dose" of background infusion along with patient control analgesia in terms of maximum analgesic efficacy, maximum hemodynamic stability and minimum side effects, in patients undergoing unilateral total knee replacement.

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Detection of Congenital Heart Disease by Fetal Echocardiography and Its Correlation with Karyotype

DHARMENDRA JAIN*, SAUMYA SINGH†, MADHU JAIN‡, ANJALI RANI#, ASHISH VERMA¥, SHIVI JAIN$

ABSTRACT

Background: Congenital heart diseases (CHDs) account for a third of all major congenital abnormalities in children; nearly 1,80,000 children are born with heart defect each year in India. Approximately, 10% of present infant mortality in India may be attributed to CHD alone. Such high mortality is due to laying less emphasis on its prenatal diagnosis by fetal echocardiography. This study was done with objectives to find out the incidence of CHD in high risk cases and its correlation with karyotype and also evaluating the diagnostic accuracy of fetal echocardiography. **Methods:** Fetal echocardiography was performed in 142 high risk cases who attended antenatal clinic of Institute of Medical Sciences (IMS), Banaras Hindu University (BHU), Varanasi between July 2014 to June 2016 with maternal/fetal risk for CHD (maternal diabetes mellitus, collagen disorders, teratogen exposure, maternal TORCH infection, *in vitro* fertilization [IVF] conceived pregnancy, familial history of CHD, abnormal four-chamber view, monochorionic twins). **Results:** The incidence of major CHD was 28/1,000 live births and 56/1,000 live births for minor CHD in high risk group. Ventricular septal defect (16.6%) and hypoplastic left heart syndrome (16.6%) were the most common CHD detected. Family history of CHD increases the risk significantly. Fetal echocardiography was 75% (46.77-91.11, 95% confidence interval [CI]) sensitive and 94.5% (89.22-97.35, 95% CI) specific, with 92.91% (87.44-96.1, 95% CI) diagnostic accuracy. It was seen that 16.6% cases of CHD had aneuploidy detected on karyotyping (trisomy 21 and trisomy 18). **Conclusion:** Fetal echocardiography is highly sensitive and specific, when done by an experienced operator. Prenatal diagnosis of CHD and planned delivery in a cardiac facility had satisfactory immediate outcomes.

Keywords: Congenital heart disease, fetal echocardiography, karyotype, prenatal diagnosis

As a group, congenital heart disease (CHD) constitute a significant proportion (up to 25% in some studies) of congenital malformations that present in the neonatal period, and are a major cause of perinatal mortality and therefore significantly contribute to the economic burden on healthcare systems. They are frequently not detected by routine ultrasound screening examinations. Fetal echocardiography, being more sensitive and specific, is able to detect most of the CHD cases. The main focus of this study was to find out the incidence of CHDs in high risk cases, the degree of risk associated with various individual risk factors, and the role of fetal echocardiography as a prenatal diagnostic tool. Newborns with structural anomalies were also investigated for any aneuploidy, to study the correlation.

METHODS

The present study was a prospective observational study performed in high risk group (of fetal CHD) at the Dept. of Obstetrics and Gynecology, the Dept. of Radiodiagnosis & Imaging and Dept. of Cardiology, in the Institute of Medical Sciences (IMS), Banaras Hindu University (BHU), Varanasi, Uttar Pradesh.

All antenatal women attending the antenatal clinic at Dept. of Obstetrics and Gynecology, in Sir Sunderlal Hospital (SSH), BHU with any maternal indication (risk) of CHD (i.e., maternal metabolic disorder, collagen disorder, first trimester teratogen exposure, TORCH infection, *in vitro* fertilization [IVF] conceived pregnancy, bad obstetric history, maternal/fetal sibling with CHD) or fetal indication (i.e., abnormal level 2 scan,

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monochorionic twins) were recruited for the study from July 2014 to June 2016. Written and informed consent was obtained from all the participants prior to their enrollment in the Dept. of Obstetrics and Gynecology.

Ultrasound fetal biometry, measurement of nuchal fold thickness, targeted imaging for fetal anomalies were performed on each antenatal women with the indication of CHD. Echocardiogram was performed by transabdominal route between 18-20 weeks of pregnancy.

RESULTS

The data were collected from 142 high risk cases for fetal CHD. The analysis of the data collected have indicated that majority of high risk cases were between 25-29 years age group (45.1%) followed by 33.8% between 20-24 years age group. Maximum patients were multigravida (71.8%), among whom 31.3% had previous mid-trimester abortions and 11.7% had previous term intrauterine deaths (IUDs)/stillborns; 2.8% were monochorionic twin pregnancies. Indications of fetal echocardiography in study group are depicted in Table 1, which shows abnormal level 2 scan was the most common indication.

Abnormal Fetal Echocardiographic Findings and Postnatal Echocardiography

Table 2 shows that among 142 high risk cases studied, fetal echocardiogram was abnormal in 10.5% (15/142) with 7.04% (10/142) confirmed postnatally. Ventricular septal defect (VSD; 16.6%) and hypoplastic left heart syndrome (HLHS; 16.6%) were the most common CHD detected. One tricuspid atresia (TA) and 1 pulmonary stenosis (normal fetal echocardiography) were diagnosed in postnatal echocardiogram. The incidence of CHD was found to be 56/1,000 live birth for minor CHD and 28/1,000 for major cardiac defects.

Correlation of Individual Risk Factor with Cardiac and Extracardiac Anomaly

Table 3 shows that among patients with metabolic disorder (i.e. diabetes mellitus) 6.7% neonates had cardiac anomaly and 20% had extracardiac structural anomaly. It was observed that in pregnancies conceived through IVF, extracardiac structural anomaly was detected in 37.5% neonates, which is statistically significant ($p > 0.05$). Cardiac anomaly was detected in none. The analysis indicates that 10.5% newborns with maternal TORCH infection had cardiac anomaly, while 21% had other structural anomalies ($p < 0.05$).

It was found that if the previous issue of a patient had cardiac anomaly, there was a possibility that this cardiac anomaly could resurface in her next pregnancy. The data indicated that 23.1% cases had cardiac anomaly in present issue also ($p < 0.05$), while among those with previous issue with extracardiac anomaly, 10.5% had cardiac anomaly, in fetus ($p > 0.05$); 21.1% of newborns with maternal CHD had cardiac anomaly ($p < 0.05$). Among maternal risk factors studied, familial history of congenital heart defect (maternal CHD)/sibling CHD had maximum association with CHD in newborn.

Maternal-Newborn Correlation of Cardiac Anomalies

Recurrence of septal defect was seen in 14.2% (1/7 cases of atrioventricular septal defect in mother).

Table 1. Indications of Fetal Echocardiography in Study Group (n = 142)

	No. of patients	Percentage (%)
Maternal risk factors		
Metabolic disorder (diabetes mellitus)	15	10.6
Collagen disorder	1	0.7
Teratogen exposure	1	0.7
IVF conceived	8	5.6
TORCH infection	19	13.3
Previous issue with extracardiac anomaly	22	15.5
Previous issue with cardiac anomaly	18	12.7
Maternal congenital cardiac disease	20	14.1
Fetal risk factors		
Abnormal level 2 scan	62	43.7
Monochorionic twins	4	2.8

Table 2. Abnormal Fetal Echocardiographic Findings and Postnatal Echocardiography (n = 142)

Fetal echocardiography	No. of patients (%)	Postnatally confirmed (%)
Cardiomegaly	5 (3.5)	40
Dextrocardia	1 (0.7)	100
Left to right shunt		
Prominent PDA	1 (0.7)	100
VSD	2 (1.4)	100
ASD	1 (0.7)	100
Rhythm abnormality		
Heart block/fetal arrhythmia	1 (0.7)	0
Outflow tract abnormality		
Coarctation of aorta	1 (0.7)	0
Cyanotic heart disease		
Tetralogy of Fallot	1 (0.7)	100
Hypoplastic left heart syndrome	2 (1.4)	100

Table 3. Correlation of Individual Risk Factor with Cardiac and Extracardiac Anomaly (n = 142)

Maternal risk factor	Cardiac anomaly		P value	Extracardiac anomaly		P value
	Not detected (%)	Detected (%)		Not detected (%)	Detected (%)	
Metabolic disorder	14 (93.3)	1 (6.7)	0.649	12 (80)	3 (20)	0.089
Collagen disorder	1 (100)	0 (0.0)	0.999	1 (100)	0 (0.0)	0.999
Teratogen exposure	1 (100)	0 (0.0)	0.999	1 (100)	0 (0.0)	0.999
In vitro fertilization	8 (100)	0 (0.0)	0.968	5 (62.5)	3 (37.5)	0.002
TORCH infection	17 (89.5)	2 (10.5)	0.726	15 (78.9)	4 (21)	0.033
Previous issue with extracardiac congenital anomaly	17 (89.5)	2 (10.5)	0.726	22 (100)	0 (0.0)	0.242
Previous issue with congenital cardiac disorder	10 (76.9)	3 (23.1)	0.046	17 (94.4)	1 (5.6)	0.636
Maternal congenital cardiac disease	15 (78.9)	4 (21.1)	0.033	20 (100)	0 (0.0)	0.298
Monochorionic twin	4 (100)	0 (0.0)	0.984	3 (75)	1 (25)	0.227

One mother with ASD had tracheoesophageal fistula (TEF) in newborn, one mother with TEF had patent ductus arteriosus (PDA) in newborn, one mother with pulmonary stenosis had cardiomegaly in newborn.

Risk Estimation for Cardiac Anomaly

The odds ratio (OR) and relative risk (RR) in a mother suffering with diabetes mellitus for having an issue with congenital cardiac malformation was 0.615 (0.075-5.068) and 1.560 (0.219-11.099), respectively, in maternal TORCH infection OR was 1.329 (0.268-6.594) and RR was 1.295 (0.307-5.46), in previous issue with extracardiac structural anomaly OR was 1.329 (0.268-6.594) and RR was 1.295 (0.307-5.46), in previous issue with cardiac anomaly OR was 4.0 (0.931-17.17) and RR was 3.308 (1.021-10.72), in cases with maternal congenital cardiac disease OR was 3.833 (1.029-14.28) and RR 3.237 (1.079-9.711).

Risk Estimation for Extracardiac Structural Anomaly

The OR and RR in a mother with diabetes mellitus for having issue with any extracardiac structural anomaly was 3.278 (0.78-13.77) and 2.822 (0.856-9.295),

respectively, in IVF conceived pregnancies OR was 8.33 (1.71-40.58) and RR was 5.58 (1.86-16.68), in maternal TORCH infection OR was 3.83 (1.029-14.28) and RR was 3.237 (1.079-9.711), in previous issue with cardiac anomaly OR was 0.604 (0.073-4.982) and RR was 0.62 (0.085-4.565), in monochorionic twins OR was 3.848 (0.368-40.17) and RR was 3.136 (0.523-18.77).

Correlation of Cardiac Anomaly with Karyotyping Abnormality

Out of 142 high risk cases studied, aneuploidy was detected in 7 (trisomy 21 [5], trisomy 18 [1], monosomy X [1]). Table 4 shows that among newborns with aneuploidy 28.6% had associated cardiac abnormality, but the association was not statistically significant.

Evaluation of Fetal Echocardiography in Study Group

Fetal echocardiography was found to be 75% sensitive (95% CI: 46.77, 91.11) and 94.5% specific (95% CI: 89.22, 97.35) with diagnostic accuracy of 92.9% (95% CI: 87.44, 96.1) in detecting CHDs prenatally with positive predictive value of 56.25% (95% CI: 33.18, 76.9) and negative predictive value of 97.6% (95% CI: 93.18, 99.18).

Mode of Delivery and Pregnancy Outcome

Mean gestational age at diagnosis of fetal cardiac anomaly and at their delivery was 27.5 weeks and 37.3 weeks, respectively. While 22.1% pregnancies in overall study group were delivered by lower-segment cesarean section (LSCS), the cesarean section rate was slightly higher (27.6%) in pregnancies with anomalous babies.

Approximately 46.8% newborns with structural anomalies were treated successfully with proper NICU care and early surgical intervention, 21.1% newborns died in neonatal period, 4.2% pregnancies with major anomalies were aborted and 6.3% resulted in stillborn.

Table 4. Correlation of Cardiac Anomaly with Karyotyping Abnormality

Cardiac anomaly	Karyotype			
	Normal		Abnormal	
	No.	%	No.	%
Not detected	125	92.6	5	71.4
Present	10	7.4	2	28.6

$\chi^2 = 3.8529$; $p = 0.0496$.

DISCUSSION

In this study, major indication of fetal echocardiography was fetal abnormal level 2 scan (43.7%) followed by familial/sibling CHD (in 28.2% cases patients had previous issue with congenital structural anomaly, in 14.1% cases mother had congenital cardiac disease). The incidences of CHD as seen in this study was 56/1,000 live births having minor CHD, 28/1,000 having major cardiac defects, which are higher if compared to the CHD prevalence in general population (6-8 per 1,000 pregnancies). The reason behind this difference could be due to undetected cases of CHDs in the general population, and present study being confined to high risk group at a tertiary center, with 43% already referred from periphery with abnormal anomaly scan. VSD (16.6%) and HLHS (16.6%) were the most common CHD detected in our study.

In this study, correlation of pregestational diabetes with structural anomalies was statistically insignificant ($p > 0.05$). Balsells et al[1] reported RR 2.66 (2.04-3.47) in cohort studies and OR 4.7 (3.01-6.95) in the single case-control study for major congenital heart defects in newborns of pregestational diabetic mothers. Present study indicates a lower risk as majority of cases had controlled diabetes (only 2/15 had glycosylated hemoglobin [HbA1c] >6) and due to presence of other confounding factors in nondiabetic mothers.

The correlation of IVF conceived pregnancy and maternal TORCH infection with cardiac anomaly was also found to be statistically insignificant. In IVF conceived pregnancy, cardiac anomaly was detected in none while RR/OR for extracardiac anomaly (1 Dandy-Walker syndrome, 1 renal dysplasia, 1 posterior urethral valve) were RR 5.58 (1.86-16.68)/ OR 8.33 (1.71-40.58). However, Davies et al[2] conducted study on assisted conception in South Australia reported OR 1.26 (95% CI, 1.07-1.48) for any birth defect in IVF conceived pregnancies. Furthermore, in this study, 10.5% newborns with maternal TORCH infection had cardiac anomaly (2/19 cases - 1 dilated cardiomyopathy, 1 dextrocardia) and 21% had extracardiac anomaly (4/19 cases - meningomyelocele, cleft lip with cleft palate, hypoplastic kidney, club foot). The study also established that OR/RR for cardiac defect was OR 1.329 (0.268-6.594)/RR 1.295 (0.307-5.46), for extracardiac anomaly it was OR 3.83 (1.029-14.28)/RR 3.237 (1.079-9.711). Padmavathy et al[3] study done at Bangalore showed malformations in 25% newborns with TORCH IgM positive mother and in 3.5% newborns with TORCH IgG positivity.

Significant association could be noticed between CHD in newborn and maternal CHD (4/19 cases) with OR 3.833 (1.029-14.28) and RR 3.237 (1.079-9.711). Also recurrence of septal defect was observed in 14.2% cases (1/7 cases). Oyen et al[4] conducted study on 18,708 cases of CHD in Denmark reported overall RR 8.38 (6.82-10.3) for same CHD in baby and 2.68 (95% CI 2.43-2.97) for dissimilar CHD. Most importantly, it was observed in the study that the patients with the previous childbirth with congenital cardiac defects also had significant association with CHD in newborn; 23.1% newborns with CHD in sibling had cardiac defect, OR 4.0 (0.931-17.17), RR 3.308 (1.021-10.72). However, the recurrence risk of similar CHD in siblings could not be determined, as data regarding the exact type of lesion in siblings were not available. Further, Gill et al[5] had observed that the incidences of CHD in pregnancies referred due to prevalence of sibling CHD to be 2.7%, and incidence of CHD for pregnancies referred due to maternal CHD was (2.9%). Such higher incidence in present study was due to presence of other confounding factors.

No cardiac defect was found in monochorionic twins and extracardiac congenital defects was identified in 25% cases (1/4 cases) with OR 3.848 (0.368-40.17) and RR 3.136 (0.523-18.77). Bahtiyar et al[6] concluded that monochorionic/diamniotic twin gestations are at a higher risk for CHDs with RR, 9.18 (95% CI, 5.51-15.29; $p < 0.001$) in presence of twin-twin transfusion syndrome (TTTS) and RR, 2.78 (95% CI, 1.03-7.52; $p = 0.04$) without TTTS.

Fetal echocardiography is an essential tool in the evaluation of CHD and has dramatically improved the accuracy of diagnosis of CHD. The reported sensitivity of fetal echocardiography has ranged from 4% to 96% in various series depending upon the equipment, level of training, study design and examination technique. It is highly sensitive and specific when done by an experienced operator. In present study, its sensitivity was found to be 75%, specificity 94.5% and diagnostic accuracy was 92.91% (87.44-96.1).

In this study, 16.6% cases of CHD had aneuploidy detected on karyotyping (2/12 cases). Trisomy 21 (in VSD) and trisomy 18 (in tricuspid atresia) were detected. Trevisan et al[7] reported the frequency of chromosomal abnormalities identified through karyotyping in cases of CHD to be 16.8%; Down syndrome being the most common (14.4%) followed by trisomy 18.

Intrapartum cesarean section was the mode of delivery in 22.1% patients while 77.9% patients delivered vaginally, in this study. Similarly, Walsh et al[8] reported LSCS is significantly higher in fetal CHD than nonanomalous controls (21% vs. 13.5%), predominantly related to cesarean section for nonreassuring fetal status. It was also identified that the rates of preterm delivery were higher in the cases of CHD.

In this study, 46.8% newborns with structural anomalies were treated successfully with proper NICU care and early surgical intervention on the other hand 21.1% newborns died during the neonatal period. The mortality rate was higher in neonates having cardiac defects with associated extracardiac or chromosomal anomalies (40% and 50%, respectively), and also in cases with severe cardiac defects (HLHS, TA). Brown et al[9] concluded that the setting in which neonatal CHD is first recognized (antenatal/postnatal) has an impact on preoperative condition, which in turn influences postoperative progress and survival after surgery. Optimal screening procedures and access to specialist care will improve outcome for neonates undergoing cardiac surgery.

CONCLUSIONS

It can be concluded that in the present study, the incidence of CHD was 56/1,000 live births for minor CHD, 28/1,000 for major cardiac defects. VSD (16.6%) and HLHS (16.6%) were the most common CHD detected. Major indication for fetal echocardiography was abnormal level 2 scan (43.7%). Majority of patients were multigravida (71.8%) among whom 31.3% had previous mid-trimester abortions and 11.7% had previous term IUDs/stillborns, emphasizing significance of previous obstetric history. Among maternal risk factors studied, familial history of congenital heart defect (maternal CHD/sibling CHD) had maximum association with CHD in newborn; 16.6% cases of CHD had aneuploidy detected on karyotyping (trisomy 21 and trisomy 18). Any fetal karyotyping abnormality is an indication for fetal echocardiography. Fetal echocardiography was found to be 75% sensitive and 94.5% specific with diagnostic accuracy of 92.9% in detecting CHDs prenatally. Increased intrapartum cesarean section rate was seen in pregnancies with anomalous babies, fetal distress being a major indication. Prenatal diagnosis of CHD and planned delivery in a cardiac facility had satisfactory immediate outcomes.

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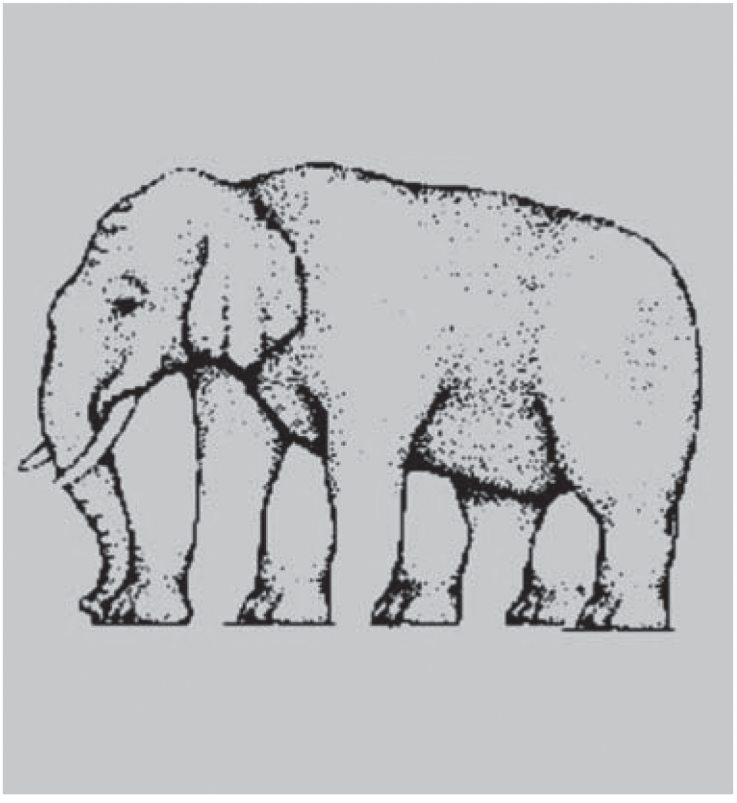
Different Perspectives of Life



J The classical elephant illusion is used for mental counseling. The elephant has four legs but it looks more.

Lead Toxicity Among Automobile Garage Workers in the Vicinity of Nalanda Medical College and Hospital, Patna and the Adjoining Areas of Patna, Bihar, India

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ABSTRACT

In India, particularly in state of Bihar, there are numerous small-scale and medium industries, which use lead-based raw materials that may pose health risks to workers. There are no workplace regulations for lead exposure. Moreover, there are no studies carried out on the blood lead levels (BLLs) of workers or on the contribution of common workplace practices to lead poisoning. A cross-sectional study on the BLLs of 45 automobile garage workers and 40 non-garage workers was carried out in the vicinity of Nalanda Medical College and Hospital, Patna, India. In addition to BLL analysis, data on some risk factors such as smoking, and chewing tobacco (gutka and pan parag) were gathered through structured questionnaires and interviews and data analysis was performed using SPSS (Version 16). The *t*-test was used to compare mean BLLs of study groups. The analysis of variance (ANOVA), Kruskal-Wallis, Pearson chi-square and odds ratio tests were used to investigate the associations between specific job type, smoking and/or tobacco chewing, service years and occurrence of nonspecific symptoms with BLLs. The mean BLL of the automobile garage workers was found to be significantly greater than that of the controls. The BLLs of all the lead-exposed individuals were found to be over 10 μg/dL, and 53% of them had BLLs ranging 12-20 μg/dL, with the remaining 47% having over 20 μg/dL. The BLL of the workers increased with the duration of working in an automobile garage. Individuals involved in manual car painting comprise a larger percentage (58%) of those with the highest BLLs (≥20 μg/dL). Lead accumulation in individuals who chew tobacco in the work place was found to be faster than in those who are not used to chewing tobacco. The findings of the study have clearly demonstrated that the BLLs of automobile garage workers in Patna, Bihar are considerably high with a range of 11.73-36.52 μg/dL and the workers are in danger of impending lead toxicity. The BLLs of the workers are influenced by their occupational practices, chewing tobacco at the workplace, and the time spent working in an automobile garage.

Keywords: Lead, garage workers, blood lead level, tobacco, gutka

Lead is one of the most widely distributed toxins in our environment. Although its toxic effects have been known for centuries, occupational exposure to lead that results in poisoning, be it moderately or clinically symptomatic, is still common in many countries of the world.[1,2] Excessive occupational exposure over a brief period of time can cause a syndrome of acute lead poisoning. Clinical findings in this syndrome include abdominal colic, constipation, fatigue and central nervous system dysfunction. With even greater doses, acute encephalopathy with coma and convulsions may occur, whereas in cases of milder exposures, headaches and personality changes may be the only signs of neurologic toxicity.[3]

Children are particularly susceptible to lead intoxication that causes various neurological and behavioral problems, ranging from raised hearing threshold to reduction in intelligence quotient (IQ) at low blood lead concentrations. Although no threshold has been determined for the harmful effects of lead in children, a 1991 Centers for Disease Control and Prevention (CDC) Report of UK has put the blood lead level (BLL) of concern in children at 10 μg/dL. The level of concern

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has changed over the past few decades, from 60 μg/dL (1960), to 30 μg/dL (1970), to 25 μg/dL (1985), to 10 μg/dL (1991).[4]

Occupational lead exposure in many developing countries is entirely unregulated, often with no monitoring of exposure.[5] In India, although there are numerous small-scale and large industries which use lead-based raw materials that may pose health risks to workers, there are no workplace regulations for lead exposure and no data are available with the labor departments among the workers of small-scale lead-based units with regard to lead poisoning. Many people working for different manufacturing or service rendering organizations such as battery manufacturing workers, gas-station attendants, radiator repair workers, solderers of lead products and welders, are involved in jobs, which expose them to gradual health risks from exposure to lead without having any idea about the materials they are handling. Due to lack of awareness about their exposure, workers usually eat, smoke or drink while at work and such workplace practices may aggravate their exposure.[6,7]

In India and in some other developing countries, tobacco chewing at the workplace is a common practice. The dried leaves of tobacco are chewed for their stimulating effects. After chewing the leaves, people may swallow the juice and throw away the residue or swallow whatever they chewed. In many work areas, the workers who chew tobacco (gutka) do so at the workplace. This is typically done by putting them into the mouth from time to time while performing duties. Whatever the material that the workers are handling, they do not wash their hands each time they cut the packet and put them into their mouth. As a result, various toxic substances, including lead, that have stuck to the hands of these workers might easily get transferred onto the tobacco leaves surface and then ingested with the tobacco by the workers.

Relating the concentration of heavy metals, such as lead, in humans to an environmental and occupational level is crucial in order to determine areas of health risk. Most toxicology studies rely on BLL as the measure of exposure.[8-10] Lead in shed deciduous teeth is sometimes quoted being regarded as a record of past lead exposure.[11,12] Other materials that have been used to estimate the amount of lead in human beings include hair,[13-15] urine and feces.[16,17]

Auto-garage workers in India are involved in car painting, soldering, welding and other repairing activities. The garage compounds in which the workers carry out their daily activities are usually filled with fuel exhaust from automobiles entering or leaving the garage's compounds. Moreover, workplace tobacco chewing is common practice for many auto-garage workers. Most of the workers have no idea about the toxic metals they might be exposed to; as a result, they pay little attention to protecting themselves from the possible inhalation or ingestion of such toxic substances, nor are they made aware of this or advised to take the necessary protective measures. Despite this fact, no study has been conducted to assess the BLLs of people working in auto-garages or of workers in other industries that are expected to pose health risks to workers. However, a single cross-sectional study on the occupational lead exposure of 51 workers in lead acid battery repair units of transport service enterprises at New Delhi, using δ-Aminolevulinic acid (δ-ALA) levels in the urine and serum as a biomarker, has been reported.[18]

According to data obtained, there are other small-scale industries involved in furniture production, food processing, metal and woodwork, bakery and pastry, flour-making and coffee processing. There are no large-scale industrial activities in the town, which are expected to expose workers to lead pollution. It could also be assumed in Patna that, despite the continued use of lead free petroleum, a situation where lead emissions from motor vehicles would constitute a serious risk to public health is not anticipated. Such a conclusion, however, would not be valid without evidence of completed work.

There are around more than 200 automobile garages in the city of Patna, each of which has an average of 15 workers. All of these garages offer multiple auto-repair services in a single compound. Within this compound, all workers carry out their specific jobs near other colleagues engaged in other activities, moving around to share tools and help one another. Therefore, all the workers are exposed virtually to the same extent to the toxic substances resulting from all the services offered in the auto-garage. The problem of exposure may be further compounded with the chewing of tobacco (gutka) at the work place. Preliminary observations have revealed that the automobile garage workers who are used to chewing gutka, while at work are taking the gutka under poor hygienic conditions and they have no idea about the possible toxic substances they might ingest with the gutka or inhale from the surrounding air. As a result, they use no protective devices to minimize exposure.

Therefore, the BLLs of automotive garage workers around Patna might be higher than other people who are not occupationally exposed. On top of this, auto-garage workers who are used to workplace gutka chewing and smoking might have higher BLLs than their colleagues who are not used to practicing these habits while at work. This study was therefore aimed at investigating the BLLs and associated health problems of automotive garage workers in Patna and relating the data to workplace practices of chewing gutka and smoking.

METHODS

Study Subjects and Study Design

The study was a cross-sectional BLL survey that included blood lead sampling from 45 occupationally exposed garage workers (44 males, 1 female) and 40 controls (36 males, 4 females). The occupationally exposed group included individuals who were mainly involved in manual auto spray-painting or welding for a duration of around 5-15 years in the auto-garages, where excessive usage of petrol and petroleum by-products takes place with a daily exposure of 8-12 hours. The occupationally nonexposed group members were school and university students and teachers who had apparently no history of lead exposure, were non-smokers, nontobacco chewers and nonalcoholics.

Reagents and Laboratory Ware

Analytical standard solutions of lead were prepared by serially diluting a 1,000 mg/L stock calibration standard solution (Spectro ECON). All chemicals and reagents used were of analytical grade purchased from Merck or Sigma Chemical Co.

Blood Sample Collection

Venous blood samples (4 mL each) were collected from the 45 garage workers and, 40 apparently healthy nongarage workers using carefully labeled vacutainer tubes containing 7.2 mg K_2EDTA by qualified medical laboratory professionals. All samples were then preserved at 4°C.

Blood specimen collection was carried out using separate sterilized needles and gloves for each individual. All used needles and gloves were packed in appropriately labeled disposable bags and taken to the Nalanda Medical College and Hospital, Patna waste disposal unit.

Sample Preparation

The blood specimens were heated in a hot water bath at 37°C for 25 minutes and homogenized by shaking for 1 minute. Accurately measured 3 mL of each of the blood samples was transferred into a Pyrex test tube. A 3:1 mixture of trichloroacetic acid (TCA 5%) and perchloric acid solution (2 M) was added to each test tube and centrifuged for 25 minutes at 3,000 rpm. The supernatant from each sample was decanted into a labeled sample bottle and the precipitate was further digested with 3.0 mL 2 M perchloric acid and centrifuged for 15 minutes. The supernatant from each centrifuged sample was decanted and mixed with its corresponding supernatant from the first digestion. Finally, the digests were stored at 4°C until dispatched for analysis.

BLL Analysis

The concentration of lead in the blood samples was determined by Flame Atomic Absorption Spectrometer (NovAA 300) at 283.3 nm after optimizing the various instrument parameters. Triplicate samples were analyzed in each determination and averages of triplicate measurements were taken for each sample. Instrument drift was controlled by running standards after analyzing 10 samples. Quantification of lead in blood was carried out with the help of a standard lead solution.

Data Collection

In addition to determining the concentration of lead in blood samples, data on some risk factors for lead poisoning such as: addiction to alcohol, smoking, tobacco chewing and eating and/or drinking habits at the workplace, were gathered through questionnaires and interviews. A standardized structured questionnaire, designed to yield information on associated risk factors with the observed BLL, was prepared in English and administered after obtaining consent from the participants of the study. Each item in the questionnaire was interpreted into the local language Hindi for those who did not understand English. In addition to the questionnaire, participants were interviewed privately on further points. The interviews included detailed demographic information, exposure history and the presence and nature of lead-related symptoms.

Statistical Analysis

Statistical analyses of results were basically performed by using SPSS (Version 16). Comparison of mean BLLs of study groups was carried out using a *t*-test. One-way

analysis of variance (ANOVA) was used to investigate the variation in BLL with the specific job types of the auto-garage workers. The Pearson chi-square statistic and the odds ratio test were used to investigate the associations between BLL and service years, and BLL and occurrence of nonspecific symptoms, respectively. The Kruskal-Wallis test was used to investigate the dependence of BLL on smoking and/or tobacco chewing habit in the workplace. All data were expressed as mean ± SD and the level of significance was determined at $p < 0.05$.

Ethical Consideration

The study was conducted upon obtaining ethical clearance from the Institutional Ethics Committee of Nalanda Medical College and Hospital, Patna. The purpose of the study was clearly explained to the study participants following a pre-developed procedure and oral consent was obtained from each of the participating individuals and the auto-garage owners.

Blood specimen collection was carried out using a separate sterilized needle and glove for every individual. All used needles and gloves were packed in appropriately labeled disposable bags and taken to the Nalanda Medical College and Hospital waste disposal unit.

RESULTS

BLLs of Occupationally Exposed and Non-exposed Groups

The mean lead concentrations of the garage workers and controls are given in Table 1. According to the *t*-test the difference between the mean BLL of the garage workers, 19.76 μg/dL (95% confidence interval [CI]: 18.45-21.06, median: 19.75 μg/dL; range: 11.73-36.52 μg/dL), and that of the controls, 10.73 μg/dL (95% CI: 10.05-11.41, median: 10.40 μg/dL; range: 5.6-15.64 μg/dL) is significant ($p < 0.05$).

The BLLs of the auto-garage workers were found to vary with the specific job type they are involved in. The mean BLL of the workers involved in manual auto-painting was 21.12 ± 5.59 μg/dL, that of welders 19.19 ± 4.08 μg/dL and that of workers involved in both job categories 20.30 ± 4.52. The observed differences; however, were not statistically significant ($p > 0.05$). The BLLs of the garage workers were all >10 μg/dL, while 41% of the controls had BLLs lower than this value. The remaining 59% of the controls had BLLs ranging 10-16 μg/dL. Among the garage workers, 53% had BLLs ranging from 12 to 20 μg/dL and the remaining 44% of them had 20 to 27 μg/dL. One person among the garage workers had a relatively higher BLL, 36.52 μg/dL and the person was identified to be an alcoholic, smoker, tobacco chewer and had served for 25 years in auto-garages. The female garage worker who participated in the study had a BLL of 15.87 μg/dL. She had served for over 10 years, and did not chew tobacco, smoke or drink alcohol. The mean BLL of the 4 females among the controls was 10.13 μg/dL (95% CI: 9.36-10.90, median: 9.96 μg/dL; range: 9.38-11.22 μg/dL).

BLLs of Occupationally Exposed Group Relative to Service Years

The proportion of individuals with BLLs <15, 15-20 or above 20 μg/dL among the garage workers with service years between 1-3, 3-6 and above 6 years are given in Figure 1. The figure clearly shows a steady increase in the proportion of individuals with higher BLLs with an increase in service years. The chi-square test has revealed that the dependence of BLL on service

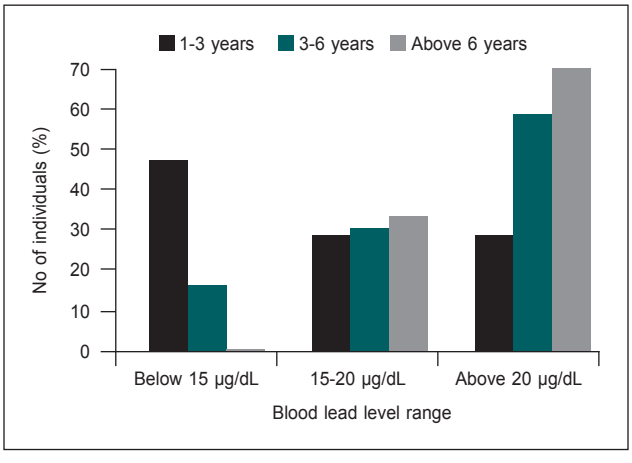

Figure 1. Proportion of the garage workers with BLLs <15 μg/dL, between 15-20 μg/dL and above 20 μg/dL in the 1-3, 3-6 and above 6 years of service categories.

Table 1. BLLs of the Garage Workers and Controls

Category	Mean Pb conc (μg/dL ± SD)	95% CI (μg/dL)	Range (μg/dL)	% BLL≥10 μg/dL
Garage workers	19.75 ± 4.46	18.45-21.06	11.73-36.52	100
Controls	10.73 ± 2.22	10.05-11.41	5.6-15.64	56

years is statistically significant ($p < 0.05$). Among the individuals in the 1-3 service years group, the relative number of individuals with BLLs of <15 μg/dL is greater than that of individuals with BLLs ranging from 15 to 20 μg/dL or above 20 μg/dL. Forty-six percent of the garage workers with service between 1-3 years and 14% of those with service between 3-6 years were found to have BLLs <15 μg/dL. Among the workers with more than 6 years of service, 68% had BLLs above 20 μg/dL, 32% in the range from 15 to 20 μg/dL and none of them had <15 μg/dL. Individuals with more than 10 years of service comprise a larger percentage (88%) of those with BLLs above 20 μg/dL. This clearly shows the direct relationship between BLL and service years.

BLL and Smoking/Tobacco (Gutka) Chewing Habits

The mean BLL of the total garage workers who were neither smokers nor tobacco chewers was 16.58 ± 3.5 μg/dL (n = 14) and that of the tobacco chewing nonsmokers was 20.17 ± 3.11 μg/dL (n = 25). According to the Kruskal-Wallis test, the observed BLL difference between the two groups is significant ($p < 0.05$). Table 2 illustrates the mean BLLs of the garage workers who were gutka chewers but not smokers and, non-gutka chewers and nonsmokers in the service year ranges of 1-3, 3-6 and above 6 years. As shown in this table, among the 11 individuals with service years ranging 1-3 years, the mean BLL of those who were habituated neither to gutka chewing nor to smoking had a mean BLL of 12.57 ± 0.88 μg/dL (n = 4). However, those who were nonsmokers but habituated to gutka chewing had a mean BLL of 20.19 ± 4.06 μg/dL (n = 7). Six of the seven gutka chewers had BLLs above 18 μg/dL and only one individual had a BLL of 13.89 μg/dL. The fact that both the gutka chewers and nonchewers are not smokers and that the BLLs of the nongutka chewers is significantly lower than that of the gutka chewers indicates that gutka chewing either accelerates lead accumulation or is an additional source of lead intake.

A similar difference between the two groups was not observed in the BLLs of the individuals with more than 3 years of service in the auto-garages. The impact of gutka chewing on lead accumulation steadily decreased with service years, and in individuals with more than 10 years of service its impact was not visible.

Lead Toxicity Symptoms

The odds ratio of the reported nonspecific symptoms in the garage workers in relation to the controls was calculated and the results obtained are shown in Table 3. The results clearly show that among the reported nonspecific symptoms, the occurrence of wrist drop, tingling and numbness in fingers and hands, nausea and decreased libido in the auto-garage workers are significantly greater than in the controls.

The proportion of individuals affected by the nonspecific symptoms among the individuals with BLLs: <16, 16-20 or above 20 μg/dL, was assessed and the results obtained are illustrated in Figure 2.

Table 2. Relationship of BLL with Smoking, Tobacco Chewing and/or Smoking Habit and Service Years

Service years	Tobacco (gutka) chewing	Smoking	n	Mean BLL (μg/dL)	Range (μg/dL)	Median (μg/dL)	CI (p = 0.05) (μg/dL)
1-3 years	×	×	4	12.57	11.73-13.8	12.37	11.69-13.45
	√	√	-	-	-	-	
	√	×	7	20.19	13.89-27.1	19.91	16.13-24.25
	×	√	-	-	-	-	
3-6 years	×	×	2	18.51	16.51 & 20.51*	-	14.59-22.43
	√	√	1	21.99	-	-	-
	√	×	4	22.04	18.21-25.94	22	18.87-23.21
	×	√	-	-	-	-	-
Above 6 years	×	×	8	18.94	15.87-21.68	19.61	17.25-20.63
	√	√	3	25.46	19.58-36.52	20.29	14.63-36.3
	√	×	14	19.63	15.66-23.69	19.06	18.29-20.97
	×	√	2	25.16	24.08 & 26.23*	-	23.06-27.26

n = Number of workers, × = Not smoking or tobacco chewing, √ = Smoking or tobacco chewing.

*Where n = 2, both blood lead concentrations are given in place of the range.

Table 3. Reported Symptoms Among the Occupationally Exposed (n = 45) and the Controls (n = 40) and the Ratio of their Odds

Symptom	No of 'Yes' response for symptom			
	Cases	Controls	Odds ratio	P value
Depression	28	7	7.76*	0.00
Memory impairment	13	6	2.30	0.21
Sleep disturbance	23	9	3.60*	0.01
Concentration difficulty	9	11	0.66	0.32
Headaches	17	14	1.13	0.91
Wrist drop	25	1	48.75*	0.00
Tingling and numbness in fingers/hands	12	1	14.18*	0.01
Lack of appetite	12	5	2.55	0.18
Nausea	10	1	11.14*	0.02
Constipation	10	3	3.52	0.13
Abdominal discomfort	16	8	2.21	0.17
Decreased libido	21	3	10.79*	0.00

*Significant relative risk of occurrence in the auto-garage workers at $p < 0.05$.

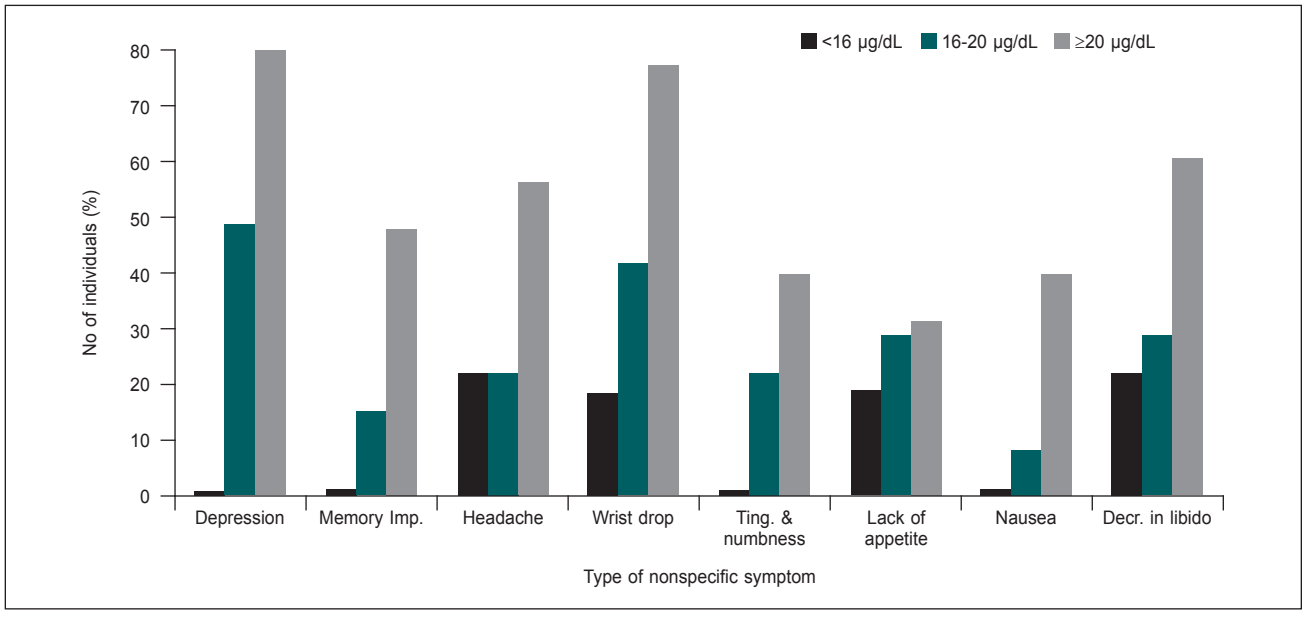

Figure 2. Nonspecific symptoms observed at different BLL.

The results clearly indicated an increase in the prevalence of all the symptoms with an increase in BLL. Among the symptoms assessed, depression, wrist drop and decreased libido were the most prevalent ones in the individuals with BLLs ≥20 µg/dL. About 80% of the garage workers in this BLL range reported having symptoms of depression, 75% for wrist drop and 58% for decreased libido.

Results of the odds ratio test for the relative occurrence of the nonspecific symptoms between the garage workers with BLLs of <20 µg/dL (n = 25) and the controls (n = 40) are given in Table 4. The results clearly show that the occurrence of most of the symptoms in the garage workers is significantly greater than in the controls ($p < 0.05$). This could be a clear indication for the negative health impacts of BLLs as low as 10 µg/dL.

During interviews, the garage workers reported some nonspecific symptoms, which were not included in the questionnaire. Among the workers, 15 (33.3%) reported having developed a feeling of metallic taste in their

Table 4. Reported Symptoms Among the Auto-Garage Workers with BLLs <20 μg/dL (n = 25) and the Controls (n = 40) and the Ratio of their Odds

	Yes responses for symptoms			
Symptoms	**Cases**	**Controls**	**Odds ratio**	**P value**
Depression	28	7	5.11*	0.02
Memory impairment	13	6	1.08	0.61
Sleep disturbance	23	9	3.18*	0.01
Concentration difficulty	9	11	0.50	0.55
Headaches	17	14	0.66	0.52
Wrist drop	25	1	26.00*	0.00
Tingling and numbness in fingers/hands	12	1	7.43*	0.04
Lack of appetite	12	5	2.20	0.06
Nausea	10	1	5.32*	0.04
Constipation	10	3	2.25	0.16
Abdominal discomfort	16	8	1.88	0.29
Decreased libido	21	3	8.22*	0.00

*Significant relative risk of occurrence in the auto-garage workers at $p < 0.05$.

mouth, 9 (20%) reported having blurred vision and 11 (24.4%) had dry white scars in one or two areas on their heads.

DISCUSSION

Occupationally related BLL assessment has not previously been carried out in any part of Patna. However, in a cross-sectional study carried out in New Delhi on lead exposure among storage battery repair workers by measuring urinary aminolevulinic acid levels, higher levels of urinary aminolevulinic acid were found in the storage battery repair workers and the possible parallel rise in BLLs of the workers was predicted. The results obtained in our study have shown that auto-garage workers have significantly greater BLL than the nongarage workers ($p < 0.05$). This clearly indicates that auto-garage workers are more likely to be exposed to lead due to occupational incidences than the general population. Furthermore, the results obtained in our study are consistent with the results of other studies carried out on the determination of the BLLs of: Ninety-seven occupationally and nonoccupationally exposed individuals in Nigeria,[19] workers involved in various types of jobs in the United Arab Emirates,[20] 31 male nonsmoking industrial workers in Iran[21] and apprentices working in lead-related industries in Turkey.[6] Among the lead-exposed garage workers, the mean BLL of individuals who were mainly involved in manual auto-painting (21.12 ± 5.59 μg/dL) was slightly higher than that of the mechanics (19.19 ± 4.08 μg/dL). Comparison of the mean values by using a *t*-test has shown that the observed difference was not; however, statistically significant. A study done in Bangkok on 52 mechanics, 27 dye sprayer and 20 controls, reported mean BLLs of 8.7 μg/dL, 12.02 μg/dL and 6.63 μg/dL, respectively.[22] The mean BLLs obtained by these researchers for all the three groups were much lower than those obtained in our study. The relative difference between the BLLs of the mechanics and the auto-painters in their study (27.6%); however, is greater than that of the difference obtained in our study (9.1%). The observed higher BLL in the painters than in the mechanics might indicate a greater exposure of the dye sprayers relative to the mechanics. The painters, in addition to the oral exposure routes, are more likely exposed to inhalation of lead fumes found in the dyes than those workers engaged in other auto-repairing activities. This could be a possible reason for the observed BLL difference between the two groups.

The garage workers were found to exhibit significantly higher levels of the nonspecific symptoms, which included: Depression, sleep disturbance, wrist drop, tingling and numbness in fingers and hands, nausea and decrease in libido relative to the controls. Moreover, the prevalence of these symptoms was higher in the workers with higher service years than in those with lower service years. Comparison of the prevalence of the nonspecific symptoms between the occupationally exposed individuals with BLLs <20 μg/dL (n = 25) with that of the controls (n = 40) has also revealed that

there is a significantly greater prevalence of most of the symptoms in the garage workers. The Association of Occupational and Environmental Clinics (AOEC) has revealed the health effects of various BLLs on lead-exposed adults, and according to this document, the nonspecific symptoms such as: Headache, sleep disturbance, fatigue and decreased libido are shown to occur in the BLL range between 20 and 39 μg/dL. However, the findings of our study suggest that these symptoms are exhibited by lead-exposed individuals at lower BLLs (10-20 μg/dL) than indicated in the AOEC document. Our report on the variations of the nonspecific symptoms between the two groups is entirely from what the two groups revealed in the questionnaires and interviews. Although this may be suggestive of the adverse effects of lead (Pb) on the exposed individuals relative to the nonexposed, a close medical investigation is required to affirm that the epidemiologic variations between the two groups are exclusively results of the difference in the BLLs of the groups.

Tobacco chewing has been found to enhance lead accumulation in the first 1-3 years of service in the occupationally exposed individuals. The mean BLL of the gutka chewers in the 1-3 service year range was 61% higher than the mean BLL of the nonchewers in the same service year range. The observed elevated level of lead in the gutka chewers could most likely be due to oral ingestion. The garage workers are chewing gutka at the workplace. Moreover, they chew the gutka while carrying out their work and do not wash their hands each time they cut the packets and put them in their mouth. This makes lead entry into the digestive system easier, thereby increasing BLL.

Several potential limitations of our study may have affected the analysis. The records of environmental Pb exposure in the proximity of the auto-garages were not available because monitoring of Pb in air was not enforced. Any observed difference in response to occupational and environmental Pb exposure may, therefore, be attributed to a degree of exposure to Pb. The participants in the control group were selected from university students and teachers. As a result, absence of some epidemiological symptoms in this group might not be exclusively attributed to lower BLL relative to the automotive-garage workers.

CONCLUSION

The BLLs of automotive-garage workers in Patna are noticeably high with a range of 11.73-36.52 μg/dL and the workers are in danger of impending lead toxicity. The BLLs of the workers are influenced by their occupational practices and roughly paralleled with the duration of occupational lead exposure. Workplace gutka chewing and lack of awareness about the ill health effects of lead and the routes through which it enters the human body contributes to the easy entry of lead into the body of the workers and the resulting elevated BLL. Further large-scale screening and regular monitoring of automobile-garage workers is urgently needed to reduce long-term adverse effects of lead exposure.

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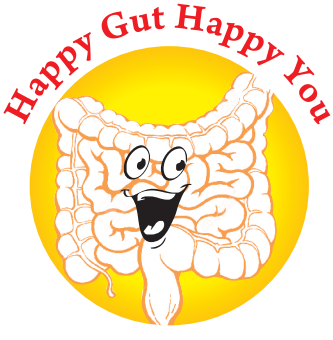

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Inadvertently Lost Cannula Sheath in External Jugular Vein: A Rare Incident

SANJIV K GOYAL*, SANDEEP SINGH MAAVI†, ASHISH GARG‡, VIJAY JAGAD#

ABSTRACT

External jugular vein cannulation is frequently used method for IV access and medications in cases where there is difficulty securing IV access in extremity. It is generally a safe procedure with fairly good technical success rate. Here we discuss a case of lost cannula sheath with in the external jugular vein that was recovered successfully surgically.

Keywords: External jugular vein, cannulation, lost cannula sheath

CASE REPORT

External jugular vein (EJV) has been used for IV access in many different condition right from trauma, burns involving extremities and in conditions like sepsis. It has been proved to be valuable for providing fluid and medications to the patients in whom cannulation of extremities is found difficult. We have a case in which the patient presented to our emergency department with chief complaints of pain in abdomen and vomiting for past 3 days.

On presentation, patient was dehydrated and was in shock. Multiple attempts were made for securing IV access over the extremities but were all futile. Plan was to insert a wide bore cannula in right EJV for fluid resuscitation and for giving medication. Patient was shifted to intensive treatment unit (ITU).

On further blood investigation and CT scan, it was revealed that patient was suffering from acute necrotizing pancreatitis. Patient was managed with fluid resuscitation, nil per mouth and IV antibiotics. On third day of admission, on examination of the neck, it was revealed that the cannula inserted in right EJV had fractured at the junction with the port site and complete sheath of the cannula had got lost in EJV.

Ultrasound on the local area was done and that revealed a well-defined linear artefact with parallel echogenic lines, of approximate size 3.9 cm, in distal part of right EJV with thrombus in the surrounding region, upper part of the right EJV was normal. This was suggestive of broken catheter with thrombus in EJV.

After discussion, it was decided to explore under general anesthesia. Patient was taken to the operation theater and after giving general anesthesia, part was painted and draped, transverse neck skin incision was given, flaps raised and the right EJV located (Fig. 1).

Phlebotomy done and cannula sheath removed safely (Fig. 2). Complete hemostasis was achieved and skin was closed with staplers. Patient was then inserted central venous line in left subclavian vein. She was managed in ITU for another 4 days and after complete resolution of pancreatitis, she was shifted to general ward and discharged form there after 2 days.

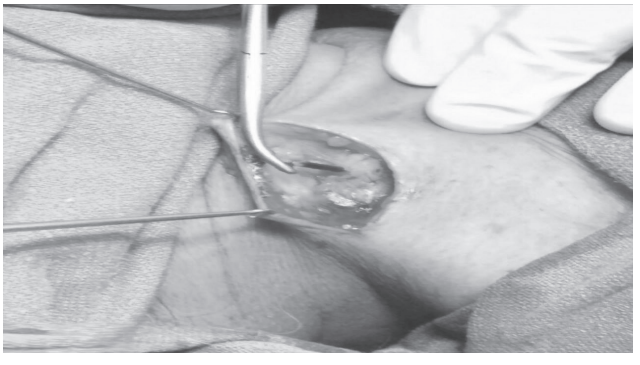

Figure 1. Cannula sheath within the right EJV seen at exploration.

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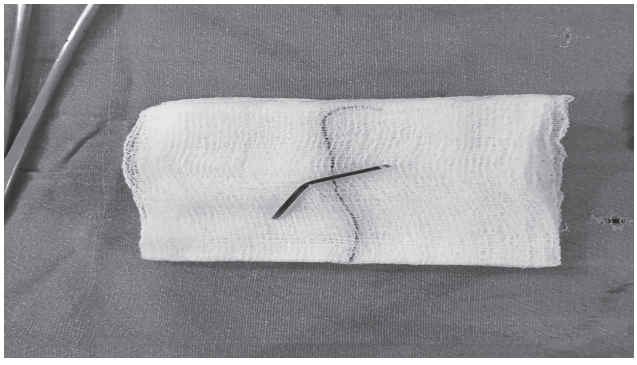

Figure 2. Extracted cannula sheath.

DISCUSSION

EJV has long been used as access for fluid resuscitation and drug administration in indoor patients.[1] Cannulation of EJV is generally done under conditions where peripheral IV access to the extremities is difficult such as in cases of shock, extremity trauma or burns involving extremity.[2] Cannulation of EJV is pretty easy and especially right side is used, usually 16 or 18 gauge canula is inserted for access. The technical success rate has ranged from 70% to 90%.[3] There are certain contraindications of EJV cannulation such as agitated and uncooperative patient, patient with short neck or with neck mass, patient having continuous vomiting.

EJV cannulation is not a fully safe procedure, there have been multiple complication associated with it. Hematoma, infection, air embolism and subcutaneous infiltration of drug are among the top in the list. Here we report a patient who had undergone EJV cannulation for IV access and had cannula fractured with the complete sheath within the right EJV. With ultrasound guidance, the sheath was confirmed within the right EJV. Under general anesthesia, local exploration was done and the sheath was recovered. Patient tolerated the procedure well and after resolving her pancreatitis issue, she was discharged home.

CONCLUSION

EJV has been tried and tested method for IV access. It is tolerated well in most of the patients with few complications to be kept in mind. Daily vigilance and proper technique helps to reduce the complications rate associated with it.

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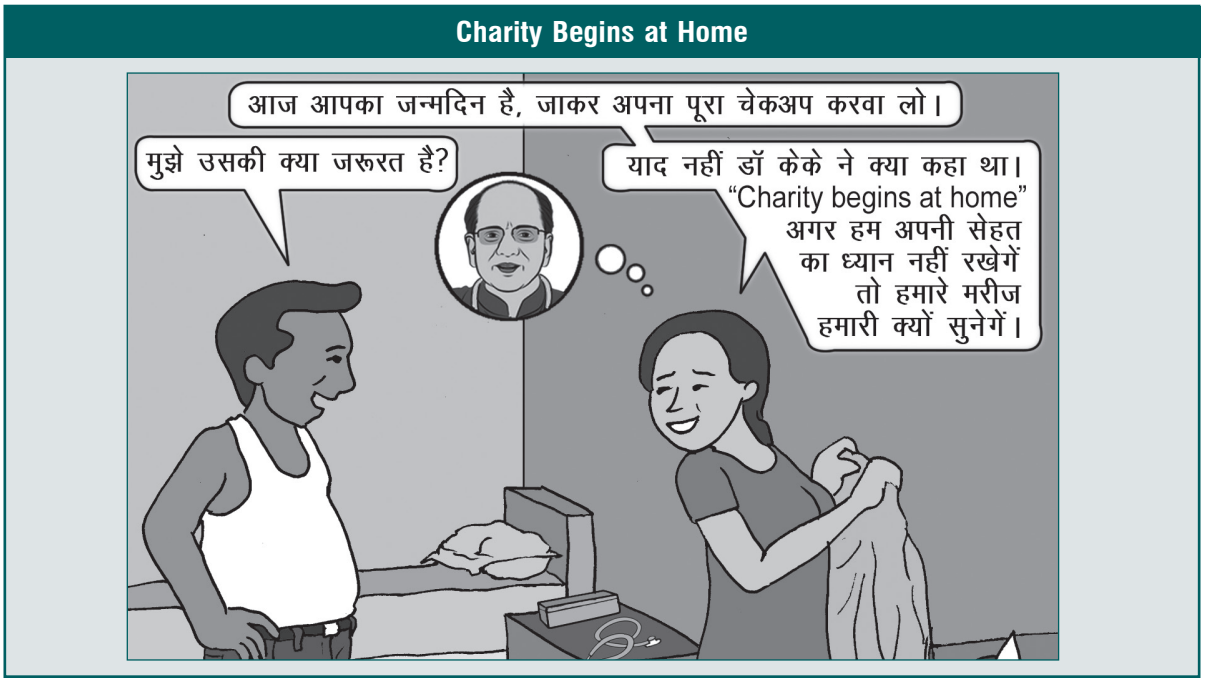

Fasting Serum Magnesium Levels in Patients with Uncontrolled and Controlled T2DM in Relation to Its Complications

SHASHIDHAR G*, SURAJ R BHUTADA†, MANJUNATH U†, PRASHANTH GK†, VINODH†

ABSTRACT

Background: Magnesium deficiency is proposed factor in pathogenesis of diabetic complications. Hypomagnesemia can be both a cause and consequence of diabetic complications. **Objective:** The aim of our study was to know the relationships between magnesium levels and diabetes its association with level of control of diabetes. **Study design:** This study was done in MVJ Medical College and Research Hospital, Hoskote, Bangalore. A total of 75 cases of type 2 diabetes mellitus (T2DM) were taken for study after satisfying the inclusion and exclusion criteria and also 35 nondiabetic patients admitted during this period were also included in this study under control group. All the patients were evaluated in detail including fasting blood sugar (FBS), postprandial blood sugar (PPBS), glycated hemoglobin (HbA1c) and fasting serum magnesium levels were estimated by using Calmagite method. **Results:** The serum magnesium among cases and controls are 1.88 ± 0.28 mg/dL and 2.10 ± 0.29 mg/dL, respectively. The mean serum magnesium levels in patients with controlled diabetes were 2.04 mg/dL, while they were 1.73 mg/dL in uncontrolled T2DM. Significant association was found between hypomagnesemia and diabetic retinopathy and nephropathy. **Conclusions:** There was significant reduction in serum magnesium levels in diabetics compared to controls. There was significant correlation between magnesium levels and levels of control in diabetics. Uncontrolled diabetics had low levels of serum magnesium. Duration of diabetes and high levels FBS also had an association with low magnesium levels. Low magnesium levels were mainly associated with diabetic retinopathy and nephropathy.

Keywords: Type 2 diabetes mellitus, magnesium, diabetic nephropathy, diabetic retinopathy

Diabetes mellitus (DM) refers to a group of common metabolic disorders that share the phenotype of hyperglycemia. Several distinct type of DM are caused by a complex interaction of genetics and environmental factors. Depending upon etiology of DM, factors contributing to hyperglycemia include reduced insulin secretion, decreased glucose utilization and increased glucose production. The metabolic dysregulation associated with DM causes secondary pathophysiologic changes in multiple organ systems such as microvascular (retinopathy, nephropathy, neuropathy) and macrovascular (coronary heart disease, peripheral arterial disease, cerebrovascular disease).[1]

Low magnesium status has repeatedly been demonstrated in patients with type 2 diabetes. Magnesium deficiency appears to have a negative impact on glucose homeostasis and insulin sensitivity in patients with type 2 diabetes.[2]

Magnesium deficiency has been found to be associated with microvascular disease in diabetes. Hypomagnesemia has been demonstrated in patients with diabetic retinopathy, lower levels of magnesium more is the risk for diabetic retinopathy. Magnesium depletion has also been associated with arrhythmogenesis, vasospasm, platelet activity and hypertension.[3]

The reason why magnesium deficiency occurs in diabetes are not clear but may include increased urinary loss, lower dietary intake or impaired absorption of magnesium compared to nondiabetic individuals.[4]

Low dietary intake can also contribute to hypomagnesemia in diabetics. Patients with type 2 diabetes

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are often overweight and may consume a diet higher in fat and lower in magnesium than nondiabetics.[5,6]

The present study was undertaken to know the relationships between magnesium levels and diabetes and association with level of control of diabetes.

MATERIAL AND METHODS

Patients with type 2 diabetes admitted in MVJ Medical College and Research Hospital, Hoskote, Bangalore for a period of 1 year were included in the study. A total of 75 cases of T2DM were taken for study and also 35 nondiabetic patients admitted during this period were also included in this study under control group. All the patients were evaluated in detail including fasting blood sugar (FBS), postprandial blood sugar (PPBS), glycated hemoglobin (HbA1c) and fasting serum magnesium levels were estimated by using Calmagite method.

Inclusion Criteria

All cases of T2DM and age- and sex-matched nondiabetic patients admitted to MVJ Medical College and Research Hospital, Hoskote, Bangalore.

Exclusion Criteria

Patients with

- Chronic renal failure
- Acute myocardial infarction in last 6 months
- Malabsorption or chronic diarrhea
- History of alcohol abuse
- Hypertension, proteinuria, eclampsia
- History of epilepsy
- Patients on diuretics and receiving magnesium supplements or magnesium containing antacids.

Statistical Method

T-test was used to find the significance of mean pattern of serum magnesium between cases/controls, controlled/uncontrolled. Analysis of variance (ANOVA) was used to find the mean pattern of serum magnesium in different complications in different range of FBS.

RESULTS

A comparative study consisting of 75 diabetics and 35 controls was conducted to find serum magnesium in DM cases when compared to controls and magnesium levels in relation to complications.

The mean age of diabetics was 59.56 ± 9.70 and 58.66 ±1 0.26 was that of controls (Table 1). The mean serum magnesium levels in cases and controls was 1.88 mg/dL and 2.1 mg/dL, respectively with p value of <0.003, which was statistically significant (Table 1). Hypomagnesemia was seen in 38.6% of the cases, whereas only 2.9% of controls had hypomagnesemia (Table 1).

Mean serum magnesium levels among uncontrolled DM were lower as compared to patients with controlled DM (Table 2).

Mean serum magnesium levels in patients with and without diabetic retinopathy was 1.77 mg/dL and 2.01 mg/dL, respectively, showing that patient with diabetic retinopathy had significantly lower levels of serum magnesium compared to those without retinopathy ($p < 0.0006$) (Table 3). The mean serum magnesium levels in patients with and without diabetic neuropathy were 1.80 mg/dL and 2.09 mg/dL, respectively, which were statistically significant ($p < 0.0002$) (Table 3).

The mean serum magnesium levels in patients with and without diabetic neuropathy were 1.92 mg/dL and 1.83 mg/dL, respectively, which were not statistically significant ($p < 0.2120$) (Table 3). The mean serum magnesium levels in patients with and without ischemic heart disease (IHD) were 1.81 mg/dL and 1.92 mg/dL, respectively, which were not statistically significant ($p < 0.139$) (Table 3).

Table 1. Age, Sex, Mean FBS, Mean Serum Magnesium Among Cases and Controls

	Cases (n = 75)	Controls (n = 35)	P value
Mean age	59.56 ± 9.70	58.66 ± 10.26	
Sex			
Male	57.33%	57.14%	
Female	42.67%	42.86%	
Mean FBS (mg/dL)	206.33 ± 14.89	94.86 ± 11.78	0.0001
Mean serum magnesium (mg/dL)	1.88 ± 0.28	2.1 ± 0.29	<0.003
Serum magnesium			
<1.8	29 (38.6%)	1 (2.9%)	
1.8-2.5	45 (60.0%)	32 (91.4%)	
>2.5	1 (1.4%)	2 (5.7%)	

Table 2. Effect of Level of Control of DM on Serum Magnesium

Serum magnesium (mg/dL)	Controlled diabetes (n = 37)	Uncontrolled diabetes (n = 38)
Range (min-max)	1.5-2.7	1.1-2.1
Mean ± SD	2.04 ± 0.29	1.73 ± 0.23

P < 0.001

Table 3. Serum Magnesium Levels in Patients With and Without Retinopathy, Nephropathy, Neuropathy and IHD

Serum magnesium (mg/dL)	Mean ± SD	P value
Retinopathy	1.77 ± 0.22	<0.0006
NPDR (n = 23)	1.86 ± 0.25	
PDR (n = 16)	1.63 ± 0.20	
No retinopathy	2.01 ± 0.31	
Proteinuria (n = 53)	1.80 ± 0.28	<0.0002
Microalbuminuria (n = 35)	1.86 ± 0.29	
Macroalbuminuria (n = 18)	1.67 ± 0.20	
No proteinuria (n = 22)	2.09 ± 0.27	
Neuropathy	1.92 ± 0.32	<0.212
No neuropathy	1.83 ± 0.27	
IHD (n = 51)	1.81 ± 0.28	<0.139
No IHD (n = 24)	1.92 ± 0.32	

NPDR = Nonproliferative diabetic retinopathy; PDR = Proliferative diabetic retinopathy; IHD = Ischemic heart disease.

Mean serum magnesium levels in patients with one complication, two complications and three complications was 2.07 mg/dL, 1.79 mg/dL and 1.74 mg/dL, respectively, which means that as the number of complications increase mean serum magnesium levels decrease (Table 4).

Mean serum magnesium levels in higher FBS range was low as compared to low FBS range i.e.: in range 130-180 mg/dL, 181-230 mg/dL, 231-280 mg/dL, 281-330 mg/dL, they were 2.2 mg/dL, 1.76 mg/dL, 1.80 mg/dL, 1.73 mg/dL, respectively (Fig. 1).

Serum magnesium levels were low when HbA1c was on higher side i.e.: When HbA1c was >9.80 then serum magnesium level was <1.7 mg/dL and when HbA1c was <7.20 then serum magnesium level was >1.7 mg/dL (Table 5).

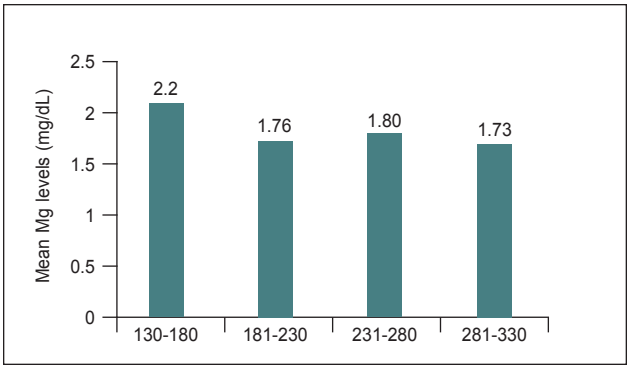

Figure 1. Comparison of serum magnesium levels according to different ranges of FBS.

Table 4. Comparison of Serum Magnesium Levels According to the Number of Complications

Serum magnesium (mg/dL)	One complication (n = 25)	Two complications (n = 35)	All three (n = 13)
Mean ± SD	2.07 ± 0.30	1.79 ± 0.25	1.74 ± 0.29

Table 5. Comparison of Serum Magnesium Levels in Relation to HBA1c Levels

Serum magnesium (mg/dL)	<1.7	≥1.7
HbA1c	9.80 ± 1.75	7.20 ± 0.70

P < 0.001

Table 6. Comparison of Serum Magnesium Levels in Relation to Duration of Diabetes

Serum magnesium (mg/dL)	0-5 years (n = 17)	6-10 years (n = 39)	11-15 years (n = 12)	16-20 years (n = 7)
Mean ± SD	2.00 ± 0.36	1.90 ± 0.27	1.71 ± 0.29	1.78 ± 0.20

Mean serum magnesium levels according to the duration of diabetes i.e.: 0-5, 6-10, 11-15 and 16-20 years were 2.00, 1.90, 1.52 and 1.78 mg/dL, respectively (Table 6).

DISCUSSION

The present study included 75 diabetics and 35 nondiabetics. Serum magnesium levels were determined in all the subjects.

The present study had diabetic patients whose ages ranged for 41-80 years, which was consistent with study done by Biradar et al.[7]

Mean age	Cases	Controls
Biradar et al	55.42 ± 12.65	55.58 ± 12.84
Present study	59.56 ± 9.70	58.66 ± 10.26

Male patients in cases and controls were 57.3% and 57.14%, respectively and females were 42.6% and 42.8%, respectively.

Mean serum magnesium	Cases	Controls	P value
Mean ± SD	1.88 ± 0.28	2.10 ± 0.29	<0.003

In this study, serum magnesium levels were more in controlled group as compared to uncontrolled group, which was consistent with the study done by Jain et al.[8]

Mean serum magnesium levels (Mean ± SD)	Controlled diabetes	Uncontrolled diabetes
Jain et al	1.85 ± 0.08	1.68 ± 0.12
Present study	2.04 ± 0.29	1.73 ± 0.23

In present study, there was no any significant association between age and sex but duration of diabetes had a relation with serum magnesium levels; patients with duration of diabetes more than 5 years had a lower serum magnesium levels as compared to those with a duration less than 5 years.

In our study also significantly lower levels of serum magnesium were observed in diabetics with microvascular complications.

Hypomagnesemia has been reported in patients with diabetic retinopathy. Lower the level of serum magnesium greater is the risk of severe diabetic retinopathy, which was consistent with study done by Kauser et al and Mirza Shariff et al.[9,10]

Mean serum magnesium levels (mg/dL)	Retinopathy	No retinopathy
Kauser et al	1.79 ± 0.15	2.25 ± 0.16
Mirza Shariff et al	1.28 ± 0.30	1.60 ± 0.40
Present study	1.76 ± 0.23	2.01 ± 0.31

The mechanism by which hypomagnesemia predisposes to retinopathy is unclear. Grafton et al[11] have proposed the inositol transport theory to explain this association. But exact reason remains obscure.

Mean serum magnesium (mg/dL)	Microalbuminuria	Macroalbuminuria
Rao et al	2.0 ± 0.24	1.80 ± 0.20
Present study	1.86 ± 0.29	1.67 ± 0.20

Above Box shows that patients with macroalbuminuria had a lower serum magnesium level as compared to patients with microalbuminuria.[12]

There was no association seen with magnesium levels in patients with neuropathy. There was a correlation between serum magnesium levels and number of complications.

Patients with only one complication had mean serum magnesium level of 2.07 ± 0.03 mg/dL and patient with two complications had a mean of 1.79 ± 0.25 mg/dL and those with three complications had a mean of 1.74 ± 0.29 mg/dL.

Patient with more than one complication had much lower serum magnesium levels, indicating more the complications, lesser the magnesium levels.

CONCLUSION

- Serum magnesium levels were low in type 2 diabetics when compared to controls.
- Levels of serum magnesium were further lowered in uncontrolled type 2 diabetics than those in whom diabetes was controlled.
- Hypomagnesemia was associated with diabetic retinopathy and diabetic nephropathy.
- No correlation was found in respect to neuropathy and IHD.
- More the duration of diabetes and the levels of FBS, lower was the serum magnesium levels.
- Hypomagnesemia is a factor in type 2 diabetes and associated with various complications and duration of diabetes leading to various complications. Hence, it is worth measuring serum magnesium levels in patients with T2DM and probably correlate their relationship with various complications.

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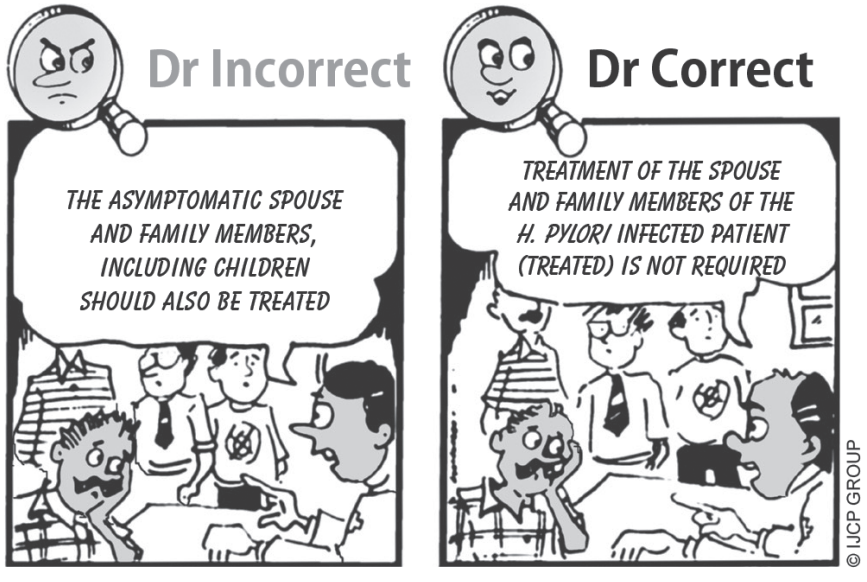
Dr Correct & Dr Incorrect

SITUATION : A patient being treated for *H. pylori* infection came with his family members for further management.



LESSON : It is unnecessary to attempt to eliminate the organism from asymptomatic family members with whom the treated patient will be in close contact.

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Inflammation

Mixed Skin Infection

Fungal Infection

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Angina Bullosa Hemorrhagica as a Presenting Feature of Malignant Hypertension: A Case Report

VIKASDEEP GUPTA*, VANDANA SHARMA†, KULDEEP THAKUR‡, VIDHU SHARMA#

ABSTRACT

A conscious and oriented 37-year-old female presented with a sudden onset small hemorrhagic lesion over the soft palate, which was diagnosed as angina hemorrhagica bullosa. Blood pressure was found to be 220/180 mmHg and there was presence of papilledema on funduscopic examination. Patient was diagnosed as a case of malignant hypertension, which was treated medically for hypertension and no local treatment was given. Lesion resolved and patient was free of symptoms after 2 weeks.

Keywords: Hemorrhagic lesion, soft palate, angina hemorrhagica bullosa, papilledema, funduscopic examination, malignant hypertension

Badham suggested angina bullosa hemorrhagica (ABH) as the term for an oral mucosal blood blister that occurs without any evidence of blood dyscrasias or vesiculobullous disorders.[1] Exact cause of ABH is still not determined, although most cases described in the literature seem to be associated with the long-term use of inhaled steroids, hypertension, consumption of hot beverages (thermal injury), mastication-related traumatic injuries, chronic renal failure, asthma, diabetes, rheumatoid arthritis, gastrointestinal disturbances and hyperuricemia, etc.[2-7] This can help in further identifying the etiology of ABH as well as may enhance the knowledge of various presenting features of malignant hypertension, which should be ruled out in every case.

CASE REPORT

A 37-year-old female patient presented to the ENT Department with complaints of foreign body sensation noticed, more on swallowing. The symptoms appeared few hours ago and were sudden in onset. There was no history of bleeding from throat or respiratory distress. There was no history of recent trauma or intake of hot beverages. There was no history of chronic disease or prolonged drug intake.

On examination, there was a single blood filled blister over the soft palate in the midline, dumbbell-shaped in appearance with regular margins. It measured about 3 cm in the long axis and about 1.5 cm in the maximum horizontal dimension. The blister was dark red in color, tense and nontender on palpation (Fig. 1). Surrounding mucosa was normal without any evidence of erythema or scarring. Indirect laryngoscopic examination was normal. Rest of the ENT examination did not reveal any abnormality. No hemorrhagic lesions were seen on the rest of the body. Oral hygiene was good.

Blood pressure (BP) was recorded to be 220/180 mmHg in the right arm in sitting position. Immediate fundus examination of the eye revealed bilateral papilledema suggestive of end organ damage due to raised BP. Routine blood investigations including hemoglobin, total leukocyte count, differential leukocyte count, peripheral smear, erythrocyte sedimentation rate (ESR), blood sugar, urea, creatinine and coagulation profile including platelet count, prothrombin time (PT), activated partial thromboplastin time (aPTT), international normalized ratio (INR) showed values within normal limits. Rheumatoid arthritis factor was also within normal limits.

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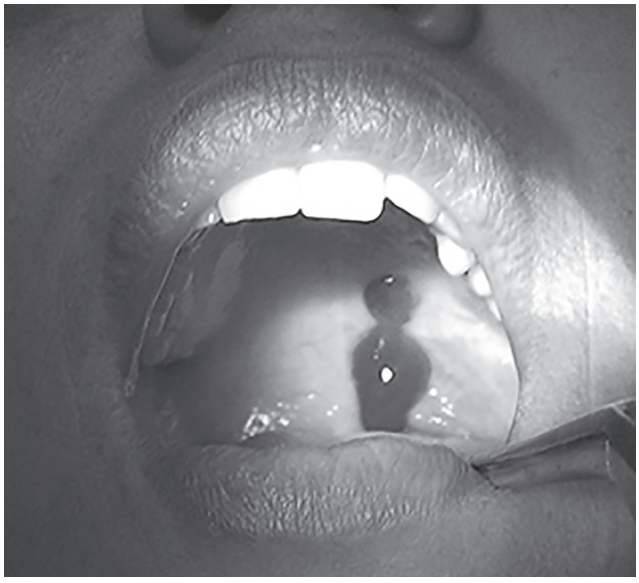

Figure 1. Hemorrhagic blister on the soft palate in the midline.

The patient was sent to the intensive care unit (ICU) where was admitted and BP was controlled. Patient was put on regular antihypertensives and was followed up for throat symptoms and lesion. Patient started noticing relief from throat symptoms after 4-5 days of starting treatment as blister started fading. The blister had completely resolved by 2 weeks after the control of BP with no subsequent scarring and the patient was free of symptoms.

Betadine mouth wash and instructions to maintain good oral hygiene and to take salt free semisolid/liquid diet was given. No other local treatment was given as the patient did not complain of any pain or odynophagia or any obstructing symptoms.

On the basis of the presenting complaints and appearance of the lesion and absence of blood dyscrasias or vesiculobullous disorders, a diagnosis of ABH was made in this case. Malignant hypertension appeared to be the cause for this sudden onset.

DISCUSSION

ABH is believed to be an idiopathic condition. ABH is usually seen in middle-aged adults with no gender predilection.[4] The chronic use of inhaled steroids affects collagen synthesis causing atrophy of the mucous epithelium and alters the synthesis of collagen reducing its content in the submucosa. Tissue elasticity may decrease with the maturation of these fibers. This leads to the poor support to the blood vessels present in the region leading to hemorrhage spontaneously or in response to minor trauma.[8] Weakening of the junction between epithelial and connective tissue can make non-keratinized mucosa more susceptible to trauma. This can also play a role in development of submucosal blisters due to minor trauma.[9]

The above said theories lead to a speculation that trauma is the most common factor for development of ABH. Other authors have reported chronic use of inhaled steroids as the predisposing factor. Hypertension is implicated in the genesis of the lesion by some authors.[10] Diabetes mellitus also seems to play a role. A case report has linked ABH to chronic renal failure.[11] The exact etiology, however, remains unknown.

The blisters are usually seen on the soft palate and may be present on the gingival mucosa or lateral border of the tongue. Multiple or recurrent lesions are uncommon.[10] No treatment is indicated for the disorder as the blister ruptures and heals spontaneously within a week. However, surgical drainage may be considered if it is obstructing the airway.[12]

In our case of hemorrhagic blister over palate, the sudden rise in BP might have caused a day minor vessel in the palate to bleed, which formed a small blister. No specific local treatment was given in our case as there were no complaints of any pain or obstructive symptoms.

The blister healed spontaneously after the BP came to normal levels within 2 weeks. Patients was put to regular medication and follow-up. No similar complaints were present after 1 year of follow-up.

CONCLUSION

This case is unique as no history of trauma or prolonged steroid inhalation was elicited. Only abnormality detected was a high BP (220/180 mmHg). The age of the presentation was also younger. The patient was not a known case of diabetes or hypertension. Therefore, the blister can be considered to have originated as a result of sudden rise in BP. This can help in further identifying the etiology of ABH. It has to be kept in mind that causes such as leukemias, thrombotic thrombocytopenic purpura (TTP), immune thrombocytopenic purpura (ITP) and other bleeding disorders must be ruled out before making a diagnosis of ABH.

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Make sure

During Medical Practice

Situation: An obese hypertensive patient was put on a calcium channel blocker.

Lesson: Make sure to remember that telmisartan improves cardiometabolic profile in obese patients with arterial hypertension. A study has demonstrated that 6-month treatment with telmisartan improves insulin sensitivity, increases the concentration of serum adiponectin and its high-molecular-weight fraction and decreases concentrations of the inflammatory markers in obese patients with arterial hypertension.

Kidney Blood Press Res. 2012;35(4):281-9.

XY Female with Complete Androgen Insensitivity Syndrome with Bilateral Inguinal Hernia

BHAVANA S

ABSTRACT

Complete androgen insensitivity syndrome (CAIS) is an X-linked recessive rare disorder in which the individual is phenotypically female and genotypically male; a male pseudohermaphrodite. CAIS is suspected when the individual is evaluated for primary amenorrhea, infertility or when unilateral/bilateral inguinal hernia is diagnosed in girls. We report the case of a 30-year-old, married lady presented to Gynecology OPD with complaints of swelling in the groin, on both the sides since 4 months. She was investigated and all her blood tests were of male range and in accordance with CAIS. Bilateral gonadectomy with herniorraphy was done and the patient was discharged on estrogen replacement therapy.

Keywords: Complete androgen insensitivity syndrome, inguinal hernia, bilateral gonadectomy, herniorraphy, estrogen replacement therapy

The complete androgen insensitivity syndrome (CAIS), previously called testicular feminization syndrome is an X-linked recessive rare disorder. The individual is phenotypically female and genotypically male; a male pseudohermaphrodite. The individuals are reared as girls and the condition is suspected when the individual is evaluated for primary amenorrhea, infertility or when unilateral/bilateral inguinal hernia is diagnosed in girls.

CASE REPORT

A 30-year-old, married lady presented to Gynecology OPD with complaints of swelling in the groin, on both the sides since 4 months. The swelling increased on coughing, straining; reduced on lying down. There was no history suggestive of obstruction/irreducibility. She had not attained menarche. She is married to a widower since 8 years. The husband has 2 children from first wife. They have no problems during sexual intercourse. She has 3 siblings; all are married and have children.

On examination, she was a tall, well-built and well-nourished female. Height - 167 cm, weight - 74 kg, arm span - 165 cm, thyroid - normal, secondary sexual characters-axillary hair and pubic hair absent, breasts-Tanner 3 (well-developed with pale areolae, immature nipple (Fig. 1). The abdomen was soft. The external genitalia was female. On per speculum examination, 4 cm

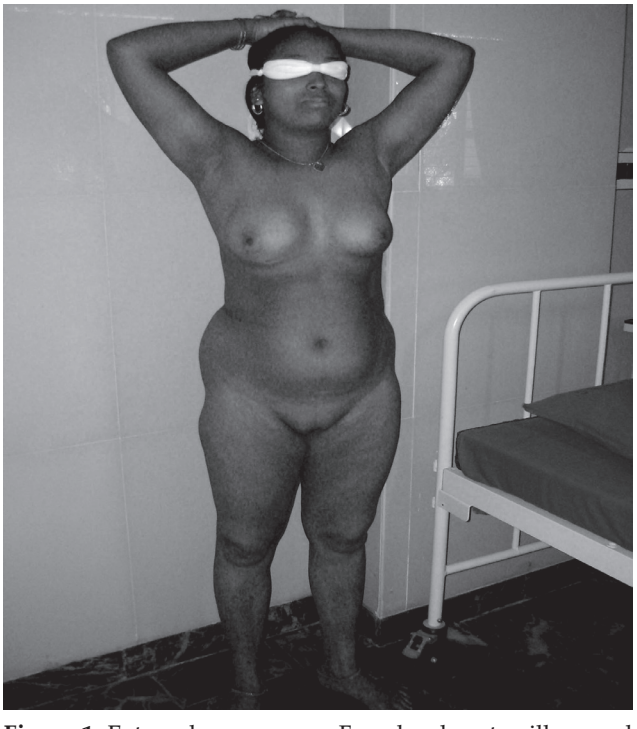

Figure 1. External appearance: Female, absent axillary and pubic hair, well developed breasts present.

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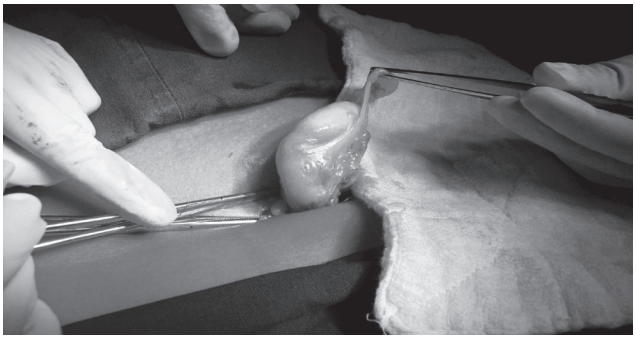

Figure 2. Intraoperative appearance of the contents of the herniating sac on the left side: Gonad, tubular structure, fibromuscular band.

long blind vaginal pouch was seen. The inguinal region on the right and left side showed, a pyriform nontender swelling of 2.5 × 2.5 cm^2 and 2 × 2 cm^2, respectively, descending till upper part of labia majora. The swellings were felt above and medial to pubic tubercle and cough impulse was present. Thus clinically bilateral inguinal hernia was diagnosed.

Sonography showed absent uterus and ovaries, oval hypoechoic structures on both sides of inguinal region suggestive of bilateral inguinal hernia. The abdominal organs were normal. Laparoscopy confirmed absence of uterus and ovaries. The chromosomal analysis, Trypsin and Giemsa produce G-banded chromosomes (GTG) banded karyotyping showed 46 XY pattern. The blood investigations: Serum testosterone - 3.04 ng/mL (male range 1.8-9.0 ng/mL, female 0.2-1.2 ng/mL); luteinizing hormone or LH - 21.04 mIU/mL (male age 20-70 years: 1.5-9.3 mIU/mL, >70 years 1.3-34.6 mIU/mL); follicle-stimulating hormone (FSH) - 2.53 mIU/mL (male 1.4-18.1 mIU/mL); serum estradiol 55.17 - pg/mL (male 11.6-42.0 pg/mL). All the blood tests were of male range and in accordance with CAIS.

After counseling, the patient was posted for surgery: Bilateral gonadectomy with herniorrhaphy. Intraoperatively the contents of the sac were gonads, tubular remnant and fibromuscular band on both sides (Fig. 2). The histopathology report confirmed testicular tissue with smooth muscle fragments, on both the sides. The postoperative period was uneventful. The patient was discharged on the 10th day. Estrogen replacement therapy with tablet premarin 0.625 mg daily was advised.

DISCUSSION

Androgen insensitivity syndrome is a rare disorder with incidence of 1 in 20,000-99,000 genetic males and the prevalence is 0.8-2.4% in phenotypic females with inguinal hernia.[1] The basic etiology is the loss of function- mutation in the androgen receptor gene. The affected individuals have 46 XY karyotype, normal testes, normal production of testosterone, normal conversion to dihydrotestosterone, normal amount of antimullerian hormone. Thus the uterus, cervix, fallopian tubes and proximal vagina do not develop. In the fetal period, insensitivity to testosterone prevents masculinization of external genitalia. The lower one-third of vagina develops, as it originates from urogenital sinus and presents as a blind vaginal pouch. There is absence of axillary and pubic hair, lack of acne, absence of voice changes at puberty. The breasts are well-developed due to conversion of testosterone to estradiol. The testes may be located anywhere along the path of embryonic testicular descent in the abdomen, inguinal canal or labia. About 80-90% of individuals with CAIS develop inguinal hernia.[1]

The testes in CAIS individuals cause pubertal feminization. Some studies have shown carcinomatous changes in the testes of the children of CAIS in the age group of 13-14 years and believe that testicular biopsy is warranted as soon as the syndrome is diagnosed. The recent studies reveal tumor incidence (dysgerminoma, gonadoblastoma) of 0.8% in CAIS and 5.5% in AIS overall, and the risk increases markedly after puberty and reaches 33% at the age of 50 years.[1,2] Thus, gonadectomy is advised after puberty. Once the testes have been removed, estrogen needs to be supplemented to maintain external female form, to prevent osteoporosis and cardiovascular changes due to the deprivement of estrogen.[1]

The studies have shown that individuals reported psychological trauma at diagnosis, which was compounded by interaction with the medical care system.[1] During counseling it was found that, the patient was reared as a female and leading a happy married life. Thus informing the patient about the karyotype would be inadvisable and would have devastating psychological problems to the patient and family. Thus, they were informed that mullerian aplasia occurred and gonads were abnormally located, with chances of malignancy and should be removed. The interaction and counseling of the affected individual and family needs sensitivity and care.

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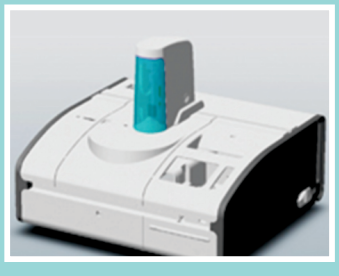

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About Sameer Malik Heart Care Foundation Fund

"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.

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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

An Interesting Cause of Hyperhidrosis and Hyperphagia – Acromegaly

MOHAMED ILIYAS*, SUNDARAMURTHY†

ABSTRACT

Hypersecretion of growth hormone (GH) before the fusion of epiphysis results in gigantism, while acromegaly results after the epiphyseal fusion. The average life expectancy of an acromegalic patient is 10 years less than the average population and the overall standardized mortality ratio is 1.48. The diagnosis is usually delayed by 6.6-10.2 years because of its indolent course. Early diagnosis and treatment can add a decade to their lifetime. We present the case of a young male with features of acromegaly, diagnosed and treated in our hospital.

Keywords: Acromegaly, gigantism, pituitary macroadenoma, growth hormone, insulin-like growth factor, macroglossia

Acromegaly is a rare disease with an annual incidence of 3-4 cases/1 million due to hypersecretion of growth hormone (GH) from a pituitary tumor or an extrapituitary tumor like lymphoma or pancreatic islet cell tumor. Less commonly, it can be due to growth hormone-releasing hormone (GHRH) secreting tumors, usually carcinoids or small cell lung cancer. Pituitary adenomas are the most common cause of acromegaly. When the lesion is a pituitary GH - secreting somatotroph adenoma, acromegaly features are present. If the lesion is an acidophil stem cell adenoma secreting GH and prolactin, hyperprolactinemia features predominate and is frequently encountered in teenagers often causing gigantism.[1] If the culprit lesion is a mixed mammosomatotroph tumor, both the features are present. GH cell carcinomas are very rare and should be suspected when extracranial metastases are present. Carcinoids are the most common cause of acromegaly due to GHRH secreting tumors. Multiple endocrine neoplasia-1, familial acromegaly, Carney's syndrome and McCune-Albright syndrome are the familial syndromes causing acromegaly.

CASE REPORT

A 34-year-old male attended our Medical OPD with complaints of excessive sweating and increased appetite since 6 months. There was a history of excessive sleeping, easy fatigability, holocranial headache, increased frequency of micturition around 4 times in the night and breathlessness progressing from New York Heart Association (NYHA) Grade I to II. These symptoms started appearing one by one during the last 6 months. He noticed that his hands have become broad but attributed it to heavy work that he does. His shirt size had changed from 40 to 44 inches, footwear from 10 to 12 inches and brief from 90 to 100 cm. His wife complained that his voice had become hoarse since 5 months. There was no history of visual disturbance, vomiting, chest pain, leg swelling or change in personality. His sexual life was normal. He had a road traffic accident 3 years back. There was contusion of right hypothalamus with intraventricular hemorrhage for which drainage was done. Splenectomy was done for splenic injury and hemoperitoneum.

On general examination, he had coarse facies, high-arched palate, macroglossia, prognathism, spade like fingers and broad feet (Figs. 1 and 2). His vitals were blood pressure (BP) - 130/90 mmHg, pulse rate - 80/min, respiratory rate - 14/min. His systemic examination was normal. Eye examination was done by ophthalmologists. Both eyes had congested bulbar

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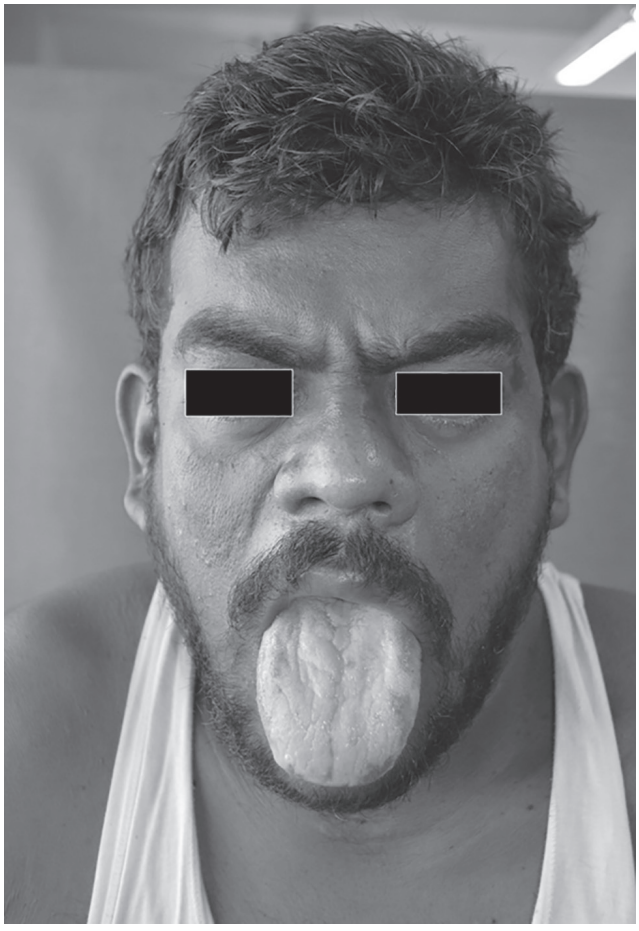

Figure 1. Acromegalic facies. Coarse skin, large fleshy nose, macroglossia and large mandible.

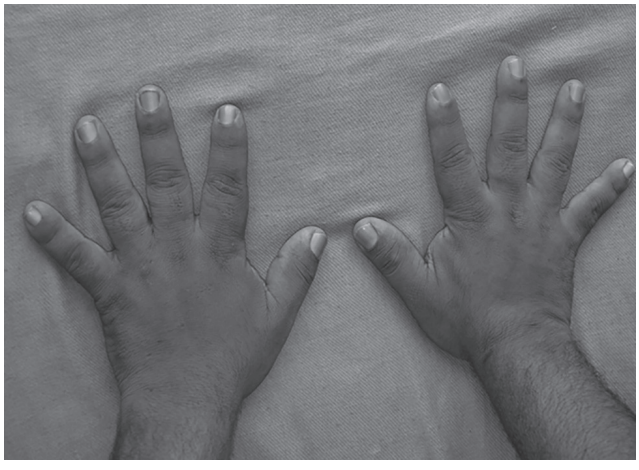

Figure 2. Paw hand. Massive hand with fat, cylindrical spatulate fingers with blunt tips.

conjunctiva, chemosis, proptosis, restricted abduction and adduction with normal fundus, color vision, field of vision. There was no diplopia on diplopia charting. Hematological investigations revealed dimorphic anemia (hemoglobin [Hb] - 6.8 g/dL) with thrombocytosis (8.17 lakh/mm^3). Renal and liver function tests were normal. Serum insulin-like growth factor 1 (IGF-1) level was elevated, 841 ng/mL (normal: 115-307). Serum prolactin was mildly elevated, 18.65 ng/mL (normal: 2.1-17.7). Computed tomography (CT) brain was normal. 1.5 Tesla magnetic resonance imaging (MRI) brain with contrast showed a well-defined oval-shaped mass of size 2 × 1.6 cm lesion in the sellar region (Fig. 3). It was isointense on T_1 and hypointense on T_2 images with heterogeneous enhancement post-contrast. The lesion did not extend to suprasellar region or involve optic chiasma. These features were suggestive of pituitary macroadenoma.

Screening of other organs was done since acromegaly affects almost all organs. Echocardiography showed concentric left ventricular hypertrophy with normal ejection fraction (60%). Ultrasound (USG) of the abdomen showed left Grade IV hydroureteronephrosis. CT abdomen showed left pelviureteric junction obstruction with gross hydroureteronephrosis (Fig. 4).

We suspected prior renal calculi. But his serum calcium (ionized - 4.2 mg/dL) and intact parathyroid hormone (37.97 pg/mL) were normal. USG of the neck showed diffuse nodular goiter confirmed by fine needle aspiration cytology. Thyroid function test was normal (free triiodothyronine [FT3] - 3.36 pg/mL, free thyroxine [FT4] - 1.20 ng/mL, thyroid-stimulating hormone

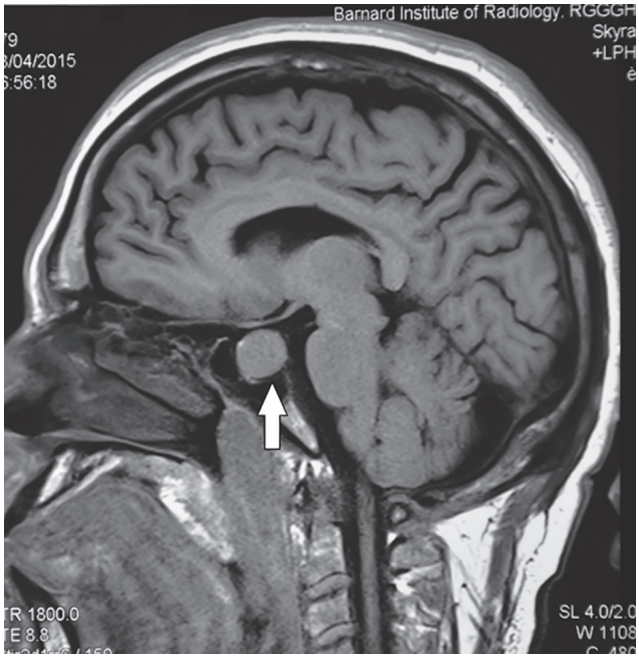

Figure 3. MRI brain. T_1-weighted image - Sagittal section. Well-defined isointense oval- shaped lesion of size 2 × 1.6 cm in the sellar region (*arrow*). Pituitary macroadenoma.

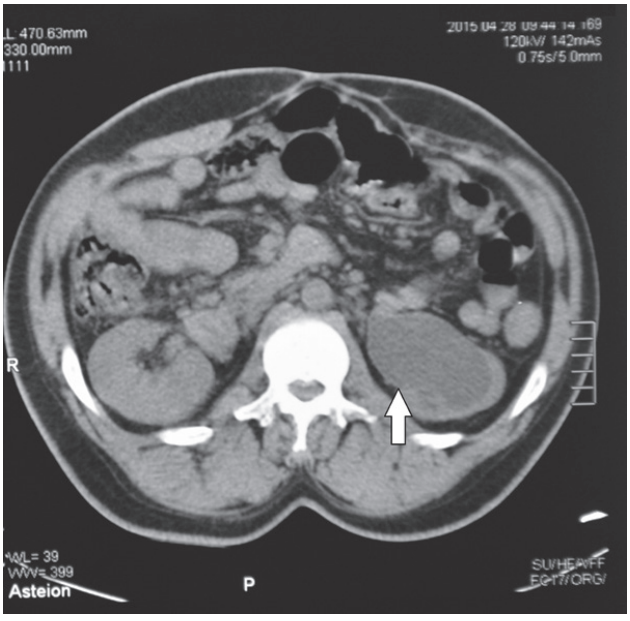

Figure 4. CT abdomen. Hydroureteronephrosis of the left kidney due to pelviureteric junction obstruction (*arrow*).

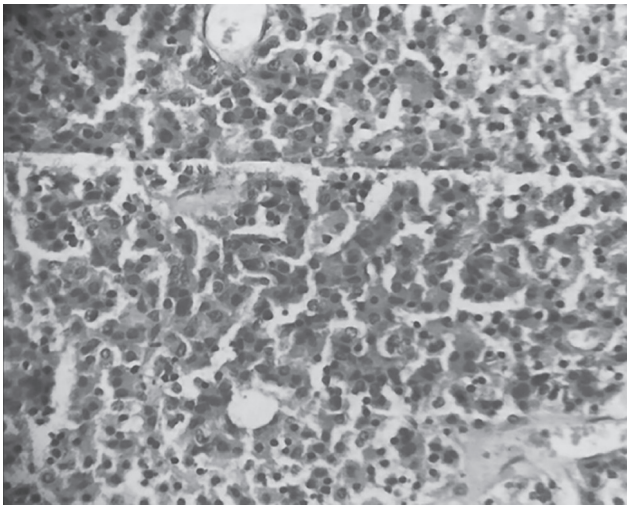

Figure 5. HPE 40X magnification. Fairly uniform round to oval cells with eosinophilic cytoplasm and centrally placed darkly staining nucleus arranged in cords, sheets and islands with focal areas of rosette formation. Tumor cells are separated by fibrovascular septae. Features of pituitary adenoma.

[TSH] - 1.16 μIU/mL). Multiple endocrine neoplasia was ruled out by the above investigations.

Tablet cabergoline 0.5 mg twice a week was started as per endocrine surgeon's advice. Two units of packed red blood cells (RBCs) were transfused. Team of endocrine and skull base surgeons resected the tumor by trans-nasal trans-sphenoidal endoscopic approach. Histopathological examination showed fairly uniform round to oval cells with eosinophilic cytoplasm and centrally placed darkly staining nucleus arranged in cords, sheets and islands. Focal areas of rosette formation and separation of tumor cells by fibrovascular septae was present (Fig. 5). These features confirmed the lesion as pituitary adenoma. Postoperatively, his IGF-1 and GH levels decreased. He was discharged and is on regular follow-up.

DISCUSSION

Growth hormone secretion is increased by GHRH, ghrelin, fasting whereas somatostatin and food intake suppresses its release. The effects of GH are mediated through GH receptors in the cartilages and liver. GH leads to IGF-1. IGF-1 levels are highest during late adulthood and in pregnancy. IGF-1 production is decreased in patients with hypothyroidism, hepatic disease, poorly controlled diabetes and in malnourished patients.[2] IGF-1 and GH act dependently and independently to cause the features of hypersomatotropism. Acromegalics have characteristic features like coarse facies, frontal bossing, large fleshy lips and nose, macroglossia, prognathism, increased gap between lower incisors, spade like fingers.

At the time of diagnosis around 60% of the patients have hypertension, arrhythmia and valvular heart diseases, which causes concentric ventricular hypertrophy and diastolic heart failure.[2] Our patient had concentric hypertrophy but didn't progress to heart failure at the time of diagnosis. Heart failure is reversible with octreotide treatment while hypertension, and valvular regurgitation are not.[2] Resting ECG can show ST-segment depression, T-wave abnormalities, conduction defects and arrhythmias in 50% of patients. Colon cancer risk is twice as common than in the general population hence screening by colonoscopy once in 3-5 years is advised.[3] Our patient was not co-operative for the procedure; however, stool occult blood was negative. Obstructive sleep apnea, snoring and narcolepsy due to soft tissue deposition around the larynx, macroglossia and nasal polyps are present in more than 50% patients.[4] Central sleep apnea associated with high GH and IGF-1 levels is also common. Voice changes are also common due to the fixation of vocal cords, laryngeal stenosis, tracheal calcification and cricoarytenoid joint arthropathy. Our patient had a deep voice, snoring and macroglossia.

Musculoskeletal manifestations are the most common features in acromegaly. Up to 70% patients have arthropathy in the form of joint swelling, hypermobility and cartilage thickening. Knee, elbow, shoulder, ankle hip and lumbosacral joints are commonly affected.

Kyphoscoliosis is common; our patient had kyphosis. Carpal tunnel syndrome is seen in half of patients due to median nerve enlargement and its entrapment in the wrist. Osteophytes are commonly seen in the anterior aspects of vertebrae and in the phalangeal tufts mainly the distal phalanges giving an appearance of spade like fingers on X-ray. Hyperhidrosis and malodorous oily skin is present in 70% of patients and is an early sign. Our patient sought medical attention for this, which helped us diagnose the pituitary lesion.

Increased glycosaminoglycan deposition and collagen production causes the typical coarse facies with skin wrinkles, nasolabial folds, fleshy nose, macroglossia, increased heel pad thickness. Heel pad thickness is measured in X-ray of the foot in a lateral view. The distance is measured between the lower most point of the calcaneum and the lower most point of the heel pad soft tissue shadow. If the measurement is >23 mm in males and >21 mm in females, the heel pad thickness is said to be increased. Phenytoin therapy, obesity and myxedema can also cause heel pad thickening. Exophthalmos if present is frequently masked by frontal bossing. Skin tags if more than 3 in number in patients above 50 years of age is a marker of colonic adenomatous polyps not related to the GH and IGF-1 levels.

Impaired glucose tolerance and diabetes mellitus is very common because of the anti-insulin effects of GH. This is reversed after surgery or somatostatin analog therapy. Our patient was euglycemic. Around 30% of patients have co-existing hyperprolactinemia; our patient had mildly elevated prolactin. Hypogonadism is present in 50% of patients which is often reversible. Thyroid dysfunction is quite common and may present with Grave's disease, nodular or diffuse goiter, toxic or nontoxic goiter. Our patient had diffuse goiter with normal thyroid function test. Screening for multiple endocrine neoplasia type 1 (MEN1) syndrome was done but parathyroid hormone was within normal levels. Age, level of GH before and after treatment, IGF-1 levels, size of the tumor, degree of invasion and duration of symptoms before the diagnosis is made are important determinants of co-existing illnesses.[2]

Some important mortality determinants are high IGF-1 levels, GH level >2.5 μg/L, older age, cardiac disease, hypertension, inadequately replaced adrenocorticotropic hormone (ACTH)-dependent adrenal insufficiency and history of pituitary radiation.[5] Younger age, shorter duration of the disease, GH levels <2.5 μg/L, absence of hypertension independently predict longer survival.[6]

The single best test to diagnose acromegaly is age- and sex-matched serum IGF-1 level. It is elevated in all patients with acromegaly distinguishing it from normal individuals.[7] Our patient had a very high level of IGF-1. GH is secreted in a phasic manner in normal individuals with the lowest levels during the day often <2 μg/L, while in the night it can be as high as 30 μg/L.[8] GH level is also influenced by sleep and food intake with a very short half-life (20 min). Hence, serum IGF-1 levels are preferred over GH levels.

However, in patients with equivocal IGF-1 levels, measurement of GH levels is additive. Oral glucose tolerance test (OGTT) is the most specific dynamic test. It is also the gold standard test to determine control of GH secretion post surgery. OGTT is done by measurement of GH levels over 2 hours of ingestion of 75 g of glucose. GH levels ≥0.4 μg/L in OGTT is diagnostic of acromegaly. GH <1 μg/L signifies disease control.

MRI brain with contrast is the radiological investigation of choice. Information on size of the tumor along with compression and invasion of adjacent structures can be obtained. Even a tumour of 2 mm can be identified but it doesn't differentiate functioning and nonfunctioning tumors. Macroadenoma (>1 cm) is seen in 75% patients. Other endocrine glands should be imaged as a part of routine work-up. ACROSCORE is a clinical tool developed for general practitioners and nonendocrinology specialists for easier identification of acromegaly. It classifies the patient into low-, medium- or high-risk of suspicion of acromegaly.

Surgical resection is the first management option for all acromegalics.[9] The transphenoidal approach normalises IGF-1 and GH in >80% microadenomas and <50% macroadenomas. Recurrence or persistence of tumor is 6% in this approach. Conventional radiotherapy and stereotactic radiosurgery causes hypopituitarism in >50%, while normalizing IGF-1 and GH in only 30%. The somatostatin analogs (octreotide, lanreotide) shrinks the tumor by 50% by normalizing IGF-1 and GH in 70% of patients.

The GH receptor antagonist pegvisomant normalizes IGF-1 in >90% patients.[2] Currently, this drug is preferred when other treatment modalities have failed, levels of IGF-1 (>900 ng/mL) are very high or whose glucose tolerance is worsened by somatostatin analogs.[9] The dopamine agonist cabergoline is less commonly used nowadays because <15% normalization of IGF-1 and GH.

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Anti-PL-12: Antisynthetase Syndrome

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ABSTRACT

Antisynthetase syndrome (ASS) is a rare idiopathic inflammatory myopathy and chronic autoimmune systemic disease. The hallmark is presence of antisynthetase antibodies among which anti-Jo-1 is the commonest. Being a rare syndrome, its presence in general population is unknown. Females have a twofold higher prevalence than males. Here, we report the case of a 51-year-old lady having interstitial lung disease as the only manifestation of ASS with raised anti-PL-12 antibody levels.

Keywords: Antisynthetase syndrome, interstitial lung disease, Jo-1, PL-12, inflammatory, myopathy

Antisynthetase syndrome (ASS) is characterized by systemic involvement of the muscles (myositis), lungs (interstitial lung disease or ILD), joints (polyarthritis), mechanic's hands and Raynaud's phenomena besides fever. Nine antisynthetase antibodies have been described till date. They include Jo-1, PL-7, PL-12, OJ, EJ, KS, Wa, Zo and YRS. Anti-Jo-1 antibodies are the commonest. This patient presented with PL-12 antibodies.

CASE REPORT

A 51-year-old lady presented with complaints of cold, cough with whitish expectoration and breathlessness on exertion since 1 month. She did not have fever, chest pain, pedal edema, orthopnea, paroxysmal nocturnal dyspnea. There was no joint pain or muscle ache. She had similar complaints since 8 years and was diagnosed to have ILD, for which she had been on steroids on and off.

During this episode, examination of respiratory system revealed mild dyspnea and bilateral crepitations. Her hemoglobin level was 9.4 g/dL with microcytic hypochromic anemia, serum creatinine 1.2 mg/dL, chest X-ray showed interstitial pneumonia and computed tomography (CT) thorax showed ground glass imaging in periphery. Ultrasonography (USG) abdomen and 2D echo was normal. Eight years ago, antinuclear antibody (ANA) profile was negative and Jo-1 was positive.

This time ANA profile was negative but raised PL-12 antibody levels were found. Spirometry showed restrictive pattern of lung disease.

DISCUSSION

Antisynthetase syndrome is a systemic disease. Its main clinical features are fever, myositis, polyarthritis, ILD, mechanic's hands and Raynaud's phenomena. Fever presents in about 20% of patients. It may occur at the onset of disease or may persist or recur with relapses.

Myositis is present in more than 90% of patients. It is associated with anti-Jo-1 antibodies, 50% of patients experience joint pain or inflammatory arthritis (Table 1). In most of them, symmetrical arthritis of small joints of hands and feet are seen. Typically, it does not result in bony erosions. Suggested classification for inflammatory myopathies is summarized in Table 2.

ILD develops in association with anti-Jo-1 antibodies. It often presents with sudden or gradual onset of deterioration of breath on exertion. Sometimes, it causes intractable dry cough. It may lead to pulmonary hypertension. Mechanic's hands affect about 30% of the patients. Thickened skin of tips and margins of fingers resemble a mechanic's hands. Reynaud's phenomena occurs in 40% of the patients. It is due to an episodic

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Table 1. Antinuclear Antibodies in Inflammatory Muscle Diseases*

Antibody specificity	Prevalence (%)	Disease specificity	Major disease associations
Anti-tRNA synthetases			**Antisynthetase syndrome**
Histidyl (Jo-1)	**20-30**	Myositis	
Threonyl (PL-7)	1-5	Myositis	
Alanyl (PL-12)	1-5	Myositis	
Glycyl (EJ)	1-5	Myositis	
Isoleucyl (OJ)	1-5	Myositis	
Asparaginyl (KS)	?	Overlap	
Selenacysteinyl (Mas)	1-2	Myositis†	?
Mi-2	**8 (15-20% of DM)**	Myositis‡	**Dermatologic involvement**
Signal recognition particle	4	No	
KJ	<1	Myositis‡	
Protease	62	No	
Histone	17	No	
RNPs		No	
U1	12		MCTD features
U2	3		
Ro	10		
La	?		
PM-Sci	8	Overlap	Overlap
Elongation factor 1α (Fer)	1	No	
Histone	?	No	
Ku	?	Overlap	
U3 snoRNP	?	Overlap	
CADM-140	?		Amyopathic DM
MDA5	?		Amyopathic DM
p140	?		DM
p155	?		DM and cancer - associated DM
SUMO-1	?		DM
TIF-γ	?		DM and cancer - associated DM

*Shown are major antinuclear antibody specificities described in inflammatory myositis, along with estimated prevalences and disease associations (bold indicates data supported by multiple studies).

†Considered a myositis-specific autoantibody (MSA) despite recent findings in autoimmune hepatitis.

‡Often referred to as MSAs.

DM = Dermatomyositis; MDAS = Melanoma differentiation-associated gene 5; RNP = Ribonucleoprotein; snoRNP = Small nucleolar RNP; snRNP = Small nuclear RNP; SUMO-I = Small ubiquitin-like modifier activating enzyme subunits A and B; TIFI-γ = Transcriptional intermediary factor 1-γ, tRNA = Transfer RNA.

reduction in blood supply of the fingers and toes which turn white, then blue and finally red. Cold and emotional stress triggers it. In some patients, nail bed capillary malformations are seen.

Some case studies have reported malignancies occurring within 6-12 months after diagnosis of ASS.

Clinical presentation presents a clue to the diagnosis. Investigations may include muscle enzymes, muscle antibodies, electromyography (EMG), magnetic resonance imaging (MRI) of affected muscles and biopsy, lung function tests, high resolution CT scan of thorax, lung biopsy. Presence of serum antibodies directed against amino acid t-RNA synthetases is the definitive diagnosis. These are cellular enzymes involved in protein synthesis. Glucocorticoids are the main treatment of ASS. Prognosis is generally grave. The autoantibodies may be antinuclear or cytoplasmic. Systemic lupus erythematosus (SLE) is usually diagnosed by the presence of ANAs (Table 3). Cytoplasmic

Table 2. Suggested Classification for Inflammatory Myopathies

Abbreviation	Description
PM	Pure polymyositis
DM	Pure dermatomyositis
OM	Overlap myositis: myositis with at least 1 clinical overlap feature and/or an overlap autoantibody
CAM	Cancer-associated myositis: with clinical paraneoplastic features and without an overlap autoantibody or anti-Mi-2

Bohan and Peter's definition of myositis

1. Symmetric proximal muscle weakness.
2. Elevation of serum skeletal muscle enzymes.
3. Electromyographic triad of short, small, polyphasic motor unit potentials; fibrillations, positive sharp waves and insertional irritability and bizarre, high-frequency repetitive discharges.
4. Muscle biopsy abnormalities of degeneration, regeneration, necrosis, phagocytosis and an interstitial mononuclear infiltrate.
5. Typical skin rash of DM including the heliotrope rash, Gottron sign and Gottron papules.

Definite myositis: 4 criteria (without the rash) for PM, 3 or 4 criteria (plus the rash) for DM.

Probable myositis: 3 criteria (without the rash) for PM, 2 criteria (plus the rash) for DM.

Possible myositis: 2 criteria (without the rash) for PM, 1 criterion (plus the rash) for DM.

Definition of clinical overlap features

Inflammatory myopathy plus at least 1 or more of the following clinical findings: polyarthritis, Raynaud's phenomenon, sclerodactyly, scleroderma proximal to metacarpophalangeal joints, typical SSc-type calcinosis in the fingers, lower esophageal or small-bowel hypomotility, DLCO lower than 70% of the normal predicted value, interstitial lung disease on chest radiogram or computed tomography scan, discoid lupus, anti-native DNA antibodies plus hypocomplementemia, 4 or more of 11 American College of Rheumatology criteria for systemic lupus erythematosus, antiphospholipid syndrome.

Definition of overlap autoantibodies

Antisynthetases (Jo-1, PL-7, PL-12, OJ, EJ, KS); scleroderma-associated autoantibodies (scleroderma-specific antibodies: centromeres, topoisomerase I, RNA polymerases I or III, Th; and antibodies associated with scleroderma overlap: Ul-RNP, U2-RNP, U3-RNP, U5-RNP, Pm-Scl, Ku, and other autoantibodies (signal recognition particle, nucleoporins).

Definition of clinical paraneoplastic features

Cancer within 3 year of myositis diagnosis, plus absence of multiple clinical overlap features; plus, if cancer was cured, myositis was cured as well.

Table 3. Antinuclear Antibodies in Systemic Lupus Erythematosus*

Antibody specificity	Prevalence (%)	SLE specific?	Major disease associations
Chromatin-associated antigens			
Chromatin	**80-90**	In high titer	
dsDNA	**70-80**	In high titer	**Renal LE, overall disease activity**
Histone	**50-70**	No	**Drug-induced lupus, anti-DNA**
	H1, H2B > H2A > H3 > H4		
Ku	**20-40**	No	Overlap
RNA polymerase II	9-14	Relatively (SLE and overlap)	
Kinetochore	6	No	
PCNA	3-6	No	
Ribonucleoprotein components			
snRNPs			
Sm core	**20-30**	Yes	

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Table 3. Antinuclear Antibodies in Systemic Lupus Erythematosus*

Antibody specificity	Prevalence (%)	SLE specific?	Major disease associations
U1 snRNP	**30-40**	No	
U2 snRNP	15		
U5 snRNP	?		
U7 snRNP	?		
Ro/SS-A	**40**	No	**Cutaneous LE**
			Neonatal LE and CHB
La/SS-B	**10-15**	No	**Neonatal LE**
Ribosomes			
PO, P1, P2 protein	**10-20**	Yes	**Neuropsychiatric LE**
28S rRNA	?		
S10 protein	?		
L5 protein	?		
L12 protein	?		
SR proteins	50-52		
Proteasome	58		
TNF TRs	61		Nephritis
RNA helicase A	6		
RNA	?		
Ki-67	?		

*Shown are major antinuclear antibody specificities described in SLE, along with estimated prevalences and disease associations (bold indicates data supported by multiple studies).

CHB = Congenital heart block; dsDNA = Double-stranded DNA; LE = Lupus erythematosus; PCNA = Proliferating cell nuclear antigen; rRNA = Ribosomal RNA; SLE = Systemic lupus erythematosus; snRNP = Small nuclear ribonucleoprotein; TNF TRs = TNF translational regulators, including T-cell intracytoplasmic antigen 1 (fIA-1) and TIA-1-related protein (TIAR).

Table 4. Correlations of Autoantibodies with Clinical Features

Autoantigen	Clinical associations
Rheumatoid factor	RA, erosive arthritis, cryoglobulinemia
Anticyclic citrullinated protein	RA
Nucleosome	SLE, Sci, MCTD
Proteasome	SLE, PM/DM, Sjogren's syndrome, multiple sclerosis
Sm snRNP	SLE
Histones H1, H2A, H2B, H3, H4	SLE, UCTD, RA, PBC, generalized morphea
Ribosomal P	SLE psychosis
dsDNA	SLE, glomerulonephritis, vasculitis
ACL/β-glycoprotein	SLE, thrombosis, thrombocytopenia, miscarriages
β_2-glycoprotein-independent ACL	MCTD (not associated with APL syndrome)
68-kD peptide of U1-RNP	MCTD, Raynaud's, pulmonary hypertension
U1 snRNP	MCTD, SLE, PM
hnRNP-A2 (also called RA-33)	MCTD, RA, erosive arthritis in SLE and Scl
Ro/La	Sjogren's, SLE, congenital heart block, photosensitivity, PBC
Fodrin	Sjogren's, glaucoma, moyamoya disease
Platelet-derived growth factor	Diffuse and limited Scl

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Table 4. Correlations of Autoantibodies with Clinical Features

Autoantigen	Clinical associations
Topoisomerase I (Scl-70)	Diffuse Scl with prominent organ involvement
Centromere	Limited Scl, CREST, Raynaud's, pulmonary hypertension, PBC
Th/To	Limited Scl
U3-snRNP	Limited Scl
hnRNP-I	Scl (early diffuse and limited)
RNA polymerases I and III	Scl (diffuse with renovascular hypertension)
Fibrillarin	Severe generalized Scl
Ku	Myositis overlap, primary pulmonary hypertension, Graves' disease
U5-snRNP	Myositis overlap
PM/Scl	Myositis overlap with arthritis, skin lesions, mechanic's hands
Signal recognition particle	Myositis overlap (severe course with cardiac disease)
Antisynthetases (Jo-1, PL-7, PL-12)	Myositis overlap with arthritis and interstitial lung disease
Mi-2	Dermatomyositis
Proteinase-3	Granulomatosis with polyangiitis (formerly Wegener's granulomatosis), pulmonary capillaritis
Myeloperoxidase	Churg-Straus, pauci-immune glomerulonephritis
Endothelial cell	Pulmonary hypertension, severe digital gangrene
α-Enolase	Behcet's, RA, MCTD, Scl, Takayasu's
Angiotensin-converting enzyme 2	AICTDs with vasculopathy

ACL = Anticardiolipin; AICTDs = Autoimmune connective tissue diseases; APL = Antiphospholipid syndrome; CREST = Syndrome of calcinosis, Raynaud's phenomenon, esophageal dysmotility, sclerodactyly and telangiectasia; DM = Dermatomyositis, hn = Heterogeneous nuclear, MOD = Mixed connective tissue disease; PBC = Primary biliary cirrhosis; PM = Polymyositis; RA = Rheumatoid arthritis; RNP = Ribonucleoprotein particle; Scl = Scleroderma; SLE = Systemic lupus erythematosus; sn = Small nuclear; UCTD = Undifferentiated connective tissue disease.

antibodies against amino acid t-RNA synthetases are a different class by themselves. They are Jo-1, PL-7, PL-12, OJ, EJ, KS, Wa, Zo and YRS. ASS presents with one of these antibodies exclusively. ANAs are absent. The correlations of autoantibodies with clinical features is presented in Table 4.

This patient had ILD as the initial and the only presentation with no evidence of myositis or arthritis. This is a rarity. In addition, in spite of recurrence of symptoms, her condition has not deteriorated for the past 8 years. Also, she has detectable PL-12 antibody levels which is rare, Jo-1 being the commonest in the community.

CONCLUSION

Presentation of ILD on imaging should raise clinical suspicion of ASS, more so if associated joint pain or muscle pain is there.In resource constrained settings, when patients with ILD and features suggesting connective tissue disorder (CTD) are evaluated, serum ANA levels are used as screening test. If it is negative, other autoantibodies are not worked for. As a result the diagnosis of ASS is missed and such patients are often labeled as CTD. This patient was also misdiagnosed and treated as CTD for 8 years. PL-12 was positive only during the recent admission. Hence, the diagnosis of ASS was made.

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Lance-Adams Syndrome: A Rare Case of Post-hypoxic Myoclonus, Developing After a Snake Bite

MEET M THACKER*, MANISH N MEHTA†

ABSTRACT

Lance-Adams syndrome (LAS) is a rare complication of a successful cardiopulmonary resuscitation (CPR) and is often accompanied by post-hypoxic action myoclonus. Less than 200 cases have been reported in medical literature till date. A 50-year-old female presented to the Emergency Department in a state of unconsciousness. Urgent intubation and CPR resulted in stabilization of vitals over a period of few days. On regaining consciousness, the patient developed myoclonus, which was characteristically present only on activity and absent at rest or during sleep. This action myoclonus was troublesome to the patient and interfering in the day-to-day activities of the patient. Patient was started on a combination therapy with levetiracetam and clonazepam, which resulted in marked diminution of myoclonus over a period of 15-20 days. Though LAS is a rare complication, proper diagnosis and prompt management may significantly reduce the morbidity and improves the quality-of-life.

Keywords: Lance-Adams syndrome, cardiopulmonary resuscitation, myoclonus, levetiracetam, clonazepam

Lance-Adams syndrome (LAS) is a rare complication of a successful cardiopulmonary resuscitation (CPR). LAS is known to present as action myoclonus, days to weeks after a successful CPR, due to hypoxic injury to brain. Post-hypoxic myoclonus (PHM) is divided into two types:

- The *acute type*, which is called "myoclonic status epilepticus," occurs within 12 hours in most cases after hypoxic brain damage in patients who are deeply comatose.
- The *chronic type*, called "the Lance-Adams syndrome," is characterized by action myoclonus beginning days to weeks after a successful CPR and persists in patients who have recovered consciousness after CPR.

LAS is a rare complication and less than 200 cases have been reported in medical literature till date. We present here a patient who was diagnosed as LAS after CPR due to cardiorespiratory arrest following a neurotoxic snake bite.

CASE REPORT

A 50-year-old female reported to our Emergency Department in a state of unconsciousness. Following a snake bite, she slipped into unconsciousness, as reported by the husband accompanying her. Her oxygen saturation on admission was 40% as measured by a finger oximeter, and respiratory movements were almost absent. After 10 minutes of vigorous CPR at the Emergency Department, her vital signs started to return. She was shifted to intensive care unit (ICU), and was given 20 vials of antisnake venom in total. She regained consciousness the next day, after being on intermittent positive pressure mechanical ventilation and vasopressor support for a day. Meanwhile, a computed tomography (CT) scan of the brain was done, which showed no significant abnormalities (Fig. 1). All routine investigations like complete blood count, liver function tests, renal function tests, urine routine and microbiological examination and serum electrolytes were within normal range as given in Table 1.

When she was tapered from sedation (midazolam) and muscle relaxation (atracurium), on the 3rd day of ICU, she developed a generalized seizure and subsequently myoclonic movements were continuously observed

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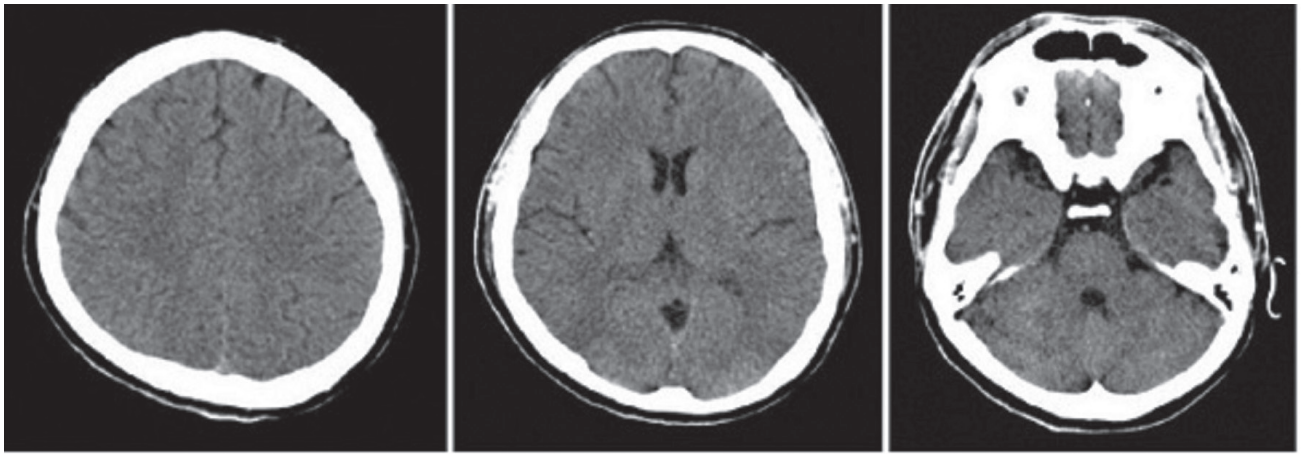

Figure 1. CT scan of the brain showing no significant abnormalities.

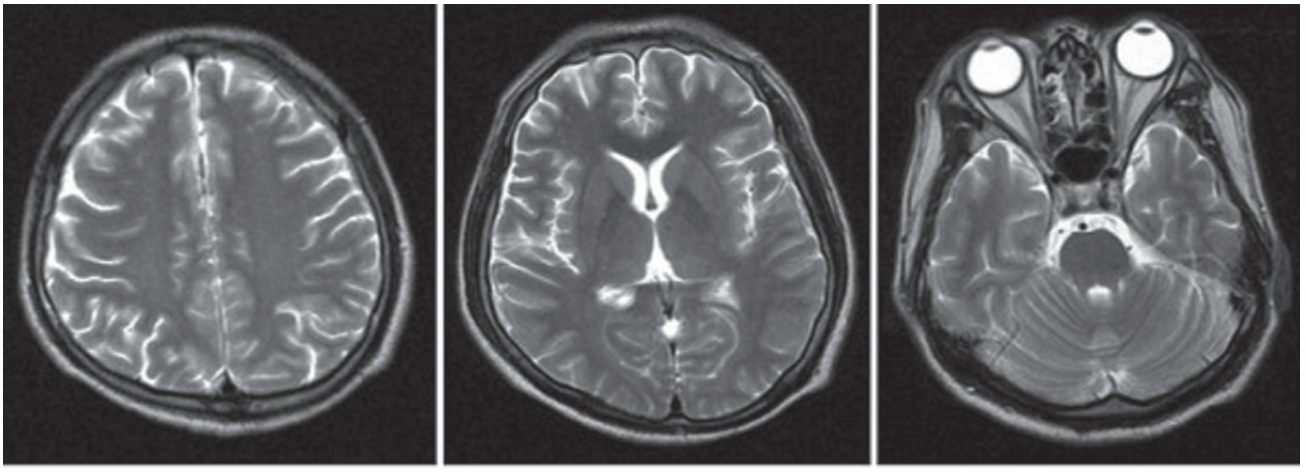

Figure 2. T_2-weighted MRI showing mild diffuse cerebral atrophy.

throughout her body, including face. At that time, the myoclonic movements were considered as generalized myoclonus secondary to hypoxic brain insult and were empirically treated with sodium valproate. However, these were not controlled with sodium valproate. The myoclonic jerks ceased with a single bolus dose of midazolam but the effect was transient. A repeat CT scan was meanwhile done, which showed no abnormalities and the T_2-weighted magnetic resonance imaging (MRI) showed mild diffuse cerebral atrophy (Fig. 2). On Day 5, the patient's mental status improved, she was now intermittently able to obey simple commands, but the myoclonic jerks continued. The rest of the central nervous system (CNS) examination was normal except higher functions, where the patient had dysarthria, dyscalculia and some attention deficits.

Subsequently, on Day 9, the patient was shifted to ward and started on levetiracetam (500 mg b.i.d.) and subsequently clonazepam (1 mg t.d.s.) was added. With these medications and physiotherapy, the patient started showing improvement, in the form of reduced frequency of myoclonic jerks, and also some improvements in higher functions. Patient was discharged on Day 21 when

Table 1. Routine Investigations

Test	Value
Hemoglobin	10.8 g/dL
Total WBC count	15,200 cells/mm^3
Differential count (N/L/M/E/B)	66/20/12/02/00%
Platelet count	1,64,000 cells/mm^3
PT/INR	14.4 sec/1.1
Serum bilirubin (total/direct/indirect)	1.2/0.4/0.8 mg/dL
SGPT	32 IU/L
Serum creatinine	0.8 mg/dL
Blood urea	28 mg/dL
Serum Na^+	138 mEq/L
Serum K^+	4.6 mEq/L

the frequency of jerks reduced to 4-9 per action, when she used to do actions slowly, but marked escalation of jerks was found on trying to speed up actions. Mild cognitive defects and dysarthria persisted though.

On regular follow-up, the patient slowly improved, though some dysarthria persisted. On 6 monthly follow-up, patient showed mark improvement, she could walk about 30 meters without support and there was marked diminution in the frequency of myoclonic jerks.

DISCUSSION

Lance-Adams syndrome (LAS) was first described in the 1960s by Lance and Adams, who described 4 patients who developed myoclonic jerks within a few days following an episode of anoxia. After recovery of consciousness, the patients continued their abnormal clonic movements, which were triggered by intentional action or external stimuli and they were relieved at resting or during sleep. Although the pathophysiology of LAS remains undetermined, the prognosis is good. It is important to distinguish LAS from post-hypoxic seizures, so a correct prognosis can be provided. One of the important clinical features is consciousness, in the acute type of post-hypoxic seizures, the patient's mental status persists as comatose, but in LAS, the patient later regains consciousness. Intentional myoclonus develops several days after the hypoxic brain insult and persists thereafter, but in post-hypoxic seizures, generalized myoclonus usually occurs within 48 hours after CPR. The myoclonus in LAS has no consistent correlation with electroencephalography (EEG) abnormalities. The patient in this case had remarkable features that are consistent with LAS.

Diagnostic imaging tests such as CT or MRI of the brain are not helpful to make a diagnosis of LAS. Neuroimaging, such as brain single-photon emission computed tomography (SPECT) or brain positron emission tomography (PET), has recently showed the anatomical and pathophysiological basis of LAS. Some studies have reported that compared with control groups, patients with LAS had significantly increased glucose metabolism in the pontine tegmentum, mesencephalon and ventrolateral thalamus. In our case, brain CT and brain MRI of the patient demonstrated no abnormalities and EEG was normal too.

The neurotransmitters related to LAS are known to be serotonin and gamma-aminobutyric acid (GABA). The loss of serotonin within the inferior olive nucleus has been thought to play a certain role and GABA may interact with the serotonin system to suppress PHM.

The treatment of LAS has not been established and a combination of medications based on the neurotransmitters has been reported. Studies have found that valproate, piracetam, levetiracetam, zonisamide, clonazepam, etc. are effective.

In this case, the patient was treated with clonazepam and levetiracetam, which were effective in controlling the PHM. Failure to recognize LAS may result in inappropriate anticonvulsant therapy and delayed treatment.

Therefore, when a patient develops uncontrolled myoclonus on regaining consciousness after CPR and the myoclonus is unsuccessfully treated with traditional anticonvulsants for a certain period, the possibility of LAS should be considered. This can lead to minimizing the patient's disabilities and improving the prognosis.

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An Unusual Case of Uterine Anomaly, Surgically Corrected with a Fruitful Pregnancy At Last

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ABSTRACT

Fusion anomalies of uterus results in a variety of uterine shapes which cause increased incidence of miscarriage, poor fetal growth, malpresentation and abnormal placental adherence in such cases. Prevalence of uterine anomalies in general population is 7-8%. We are presenting a case report of a 20-year-old P_0 patient who presented with acute abdomen. Ultrasonography revealed a hemorrhagic cyst. On laparotomy, it was found to be unicornuate uterus with hematometra in the noncommunicating arm. She was subjected to surgical correction which led to a bicornuate uterus and thereafter she was conceive twice successfully.

Keywords: Fusion anomalies of uterus, unicornuate uterus, bicornuate uterus, hematometra, surgical correction

Fusion anomalies of the uterus results in a variety of uterine shapes which cause increased incidence of miscarriage, poor fetal growth, malpresentation and abnormal placental adherence in such cases.[1-3] Prevalence of uterine anomalies in general population is 7-8%. Now, because of better availability of diagnostic modalities like transvaginal sonography, hysterosalpingography and laparoscopy, better detection of such anomalies is possible.[4] Reproductive outcomes can be improved with early diagnosis and proper surgical correction. We are reporting a case of unicornuate uterus with a noncommunicating horn which after surgical correction became a bicornuate and resulted in successful pregnancy outcome.

CASE REPORT

A 20-year-old married female was admitted with acute abdominal pain and vomiting for 1 day in MY Hospital, Indore on May 2008. As per patient, her menses lasted for 1 day only. Her ultrasonography (USG) showed a cyst of size 7.47 × 4.17 cm in right adnexal region with internal echo and absent right-sided kidney. Color Doppler showed acute hemorrhage in right ovary. Emergency laparotomy was done. Intraoperatively, there was a globular swelling on left side, which was connected to uterus (Figs. 1 and 2). Uterus was small of about 4 × 3 cm with tubes and ovary on right side only. So, it was diagnosed to be a unicornuate uterus having noncommunicating horn with hematometra (Fig. 3). Hematometra was drained and the unicornuate uterus surgically corrected to a bicornuate uterus by modified Strassman's method. Her cervical os was pin-pointed and dilation was done. On follow-up, her menstrual history showed that her cycles now lasted for 5-6 days with good flow as compared to previous scanty menses. Hysterosalpingography showed bicornuate uterus with 2 separate cavities. Cervix was common and seen in continuation of right horn with patent fallopian tube.

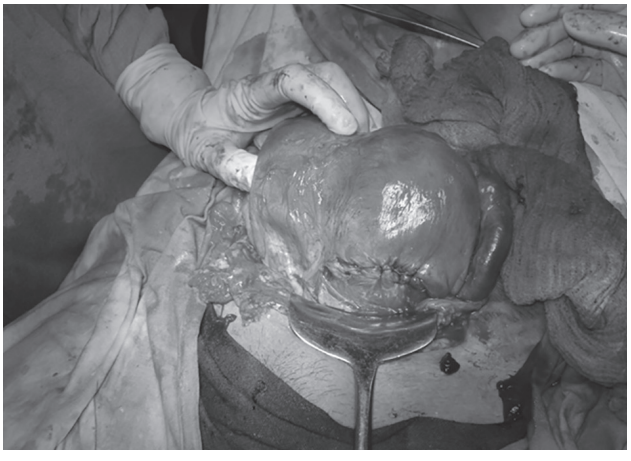

Figure 1. Globular swelling on left side.

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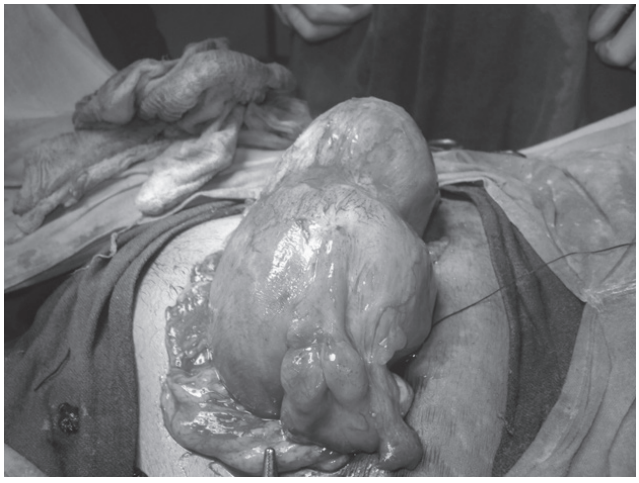

Figure 2. Globular swelling connecting to uterus.

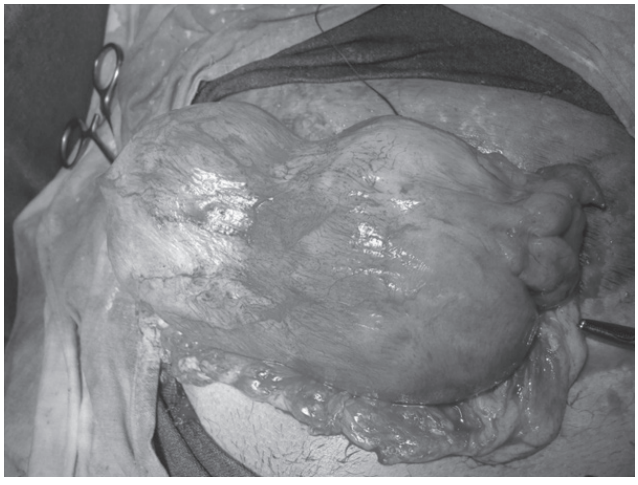

Figure 3. Unicornuate uterus having noncommunicating horn.

Outcome

She conceived after 1½ years and her last menstrual period was 20th October 2009 with expected delivery date 27th July 2010. She was admitted at 32 weeks with complaint of backache. She was kept on tocolytics and given decadron. After 1 month of ward admission, she had pain in lower abdomen and persistent tachycardia. She finally landed up in emergency lower segment cesarean section (LSCS) on 20th June 2010. A female baby of 1.5 kg with maturity around 35 weeks was delivered. She conceived second time after 1 year and a male baby of 2.26 kg with maturity of around 36 weeks was delivered through emergency LSCS and this time tubectomy was also done.

DISCUSSION

Developmental failure of one mullerian duct while the other develops normally results in unicornuate uterus[5] and accounts for approximately 20% of mullerian duct anomalies. A unicornuate uterus may be isolated, manifested in 35% patients, although it is usually associated with variable degree of a rudimentary horn. A rudimentary horn without endometrium is seen in 33% of cases and that with endometrium is seen in 32%. A rudimentary horn is designated communicating if there is communication with the endometrium of contralateral horn (10%) and noncommunicating, if there is no such communication (22%).

CONCLUSION

Various studies show that it is better to remove rudimentary horn with hematometra.[6] In this case report, an experimental surgery has been done in which rudimentary horn with hematometra after drainage was joined with a small uterus that resulted in a fruitful pregnancy.

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Unicentric Castleman's Disease

MUNISH MAHAJAN*, VIJAY J JAGAD*

ABSTRACT

Castleman's disease (CD), a rare disease of lymph nodes and related tissues is an atypical lymphoproliferative disorder. It occurs in two forms unicentric and multicentric. Unicentric CD commonly occurs in the mediastinal region. Here we present a case of unicentric CD in a retroperitoneal lymph node.

Keywords: Castleman's disease, lymphoproliferative disorder, unicentric

Castleman's disease (CD) is a rare form of lymph node hyperplasia of unknown etiology.[1] It was first described in 1954, and subsequently better defined by Castleman in 1956.[2] CD is classified into two clinical subtypes: a localized and a multifocal subtype. CD may occur anywhere along the lymphatic system, although the most common location (70%) is the mediastinum. Extrathoracic sites have been reported in the neck, axilla, pelvis and retroperitoneum.[2]

Unicentric forms of CD have been reported as single, mediastinal masses with systemic symptoms that could be resolved after surgical excision. On the other hand, patients with multicentric CD, defined by the involvement of at least 2 noncontiguous, lymph node areas, were often refractory to treatment and show worse clinical outcomes.[3]

Surgery is the optimal therapeutic approach only in the localized form, while for unresectable or disseminated disease, partial surgical resection, steroids, chemotherapy and radiotherapy have been employed with some measurable success.[2] There are three major histological subtypes: hyaline-vascular CD (HV-CD), plasma cell CD (PC-CD) and a plasmablastic-variant associated with human herpesvirus 8 and human immunodeficiency virus. The first is much more frequent (91-96%). The majority (57-91%) of localized disease is hyaline-vascular.[2]

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CASE REPORT

A 31-year-old lady presented to outpatient department with 20 days history of pain upper abdomen radiating to back. Ultrasonography of abdomen and computed

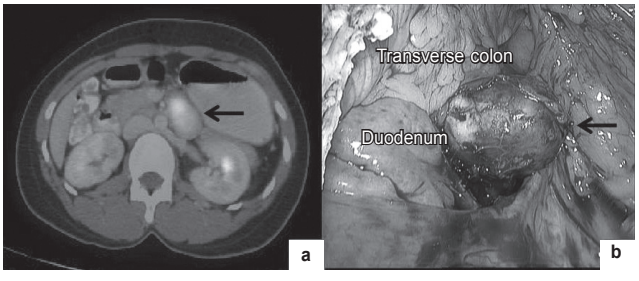

Figure 1. Hypermetabolic lesion of size 3.5 × 2.5 cm along lower border of pancreas (*arrow head*) **(a)**; well-circumscribed lymph node mass in retroperitoneum along lower border of pancreas *(arrow head)* **(b)**.

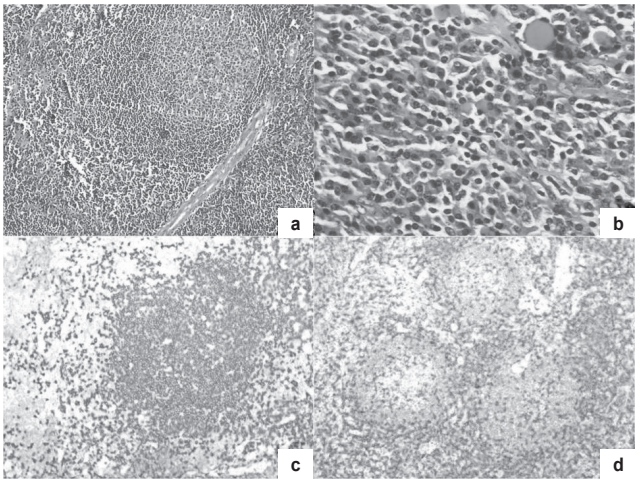

Figure 2. Atretic germinal center with prominent mantle zone and increased vascular proliferation **(a)**; interfollicular prominence of plasma cells **(b)**; CD20 diffuse positive in follicles **(c)**; CD3 highlighting interfollicular T cells **(d)**.

tomography (CT) of abdomen done elsewhere were suggestive of para-aortic lymph node mass along the lower border of pancreas. Guided fine needle aspiration cytology (FNAC) done from the lymph node mass was inconclusive. Positron emission tomography (PET) CT showed hypermetabolic lesion of size 3.5 × 2.5 cm in para-aortic region along inferior border of pancreas (Fig. 1a). Patient underwent laparoscopic excision of lymph node mass (Fig. 1b).

Histopathological examination (HPE) showed atretic germinal center with prominent mantle zone and increased vascular proliferation with interfollicular prominence of plasma cells (Fig. 2 a and b). Immunohistochemistry (IHC), showed CD20 diffuse positive in follicles and CD3 positivity highlighting interfollicular T cells (Fig. 2 c and d). Based upon aforementioned findings diagnosis of unicentric Castleman's disease (mixed variant) was made.

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■■■■

Different Perspectives of Life

J It is a classical left-right conflict in which the right brain tries to say the said colour but the left brain insist on reading the word.

Extensive Dorso-lumbar En-plaque Meningioma Mimicking Ligamentum Flavum Hypertrophy

AMIT AGRAWAL*, RAJESH DULANI†, ANIL AGARWAL‡

ABSTRACT

We report a case of extensive dorso-lumbar en-plaque meningioma that was mimicking ligamentum flavum hypertrophy and review the literature. A 65-year-old male presented with history of low back pain of 2-year duration with worsening of the pain since past 2 months. On examination, he had flaccid paraplegia with bowel and bladder involvement. Magnetic resonance imaging findings were suggestive of extensive ligamentum flavum hypertrophy. The patient underwent D9-L2 laminectomy. The dura was thickened and extensively vascular and the lesion could be partially excised. Histopathology was suggestive of meningioma. Spinal en-plaque meningiomas are rare and challenging lesions associated with poorer outcome.

Keywords: En-plaque, meningioma, spinal tumor

Spinal en-plaque meningiomas are rare and challenging lesions and[1-4] rarely en-plaque spinal meningioma can mimic ossification of the ligamentum flavum, and only reported once in the literature.[4] We report a case of extensive dorso-lumbar en-plaque meningioma that was the mimicking ligamentum flavum and review the literature.

CASE REPORT

A 65-year-old male presented with history of low back pain of 2-year duration and worsening of the pain since past 2 months. He also developed progressive weakness of both the lower limbs with complete loss of movements since past 15 days. He had urinary retention 1 week back for which he was catheterized. He also complained of constipation since last 15 days. There was no history of trauma or fever. His general and systemic examination was normal. Higher mental functions and cranial nerves were normal. Neurological functions in upper limbs were normal. There was flaccid paralysis in both lower limbs with grade 0/5 power. There was complete loss of sensation below D-10 level to all modalities. Anal sphincter tone was lax. All deep tendon reflexes in lower limbs were absent. Abdominal reflexes were absent and plantars were not elicitable.

Magnetic resonance imaging (MRI) of dorso-lumbar spine showed dorsally placed mildly hyperintense lesion on T1 images becoming hypointense on T2 images extending from D9-L2 level (Fig. 1). A diagnosis

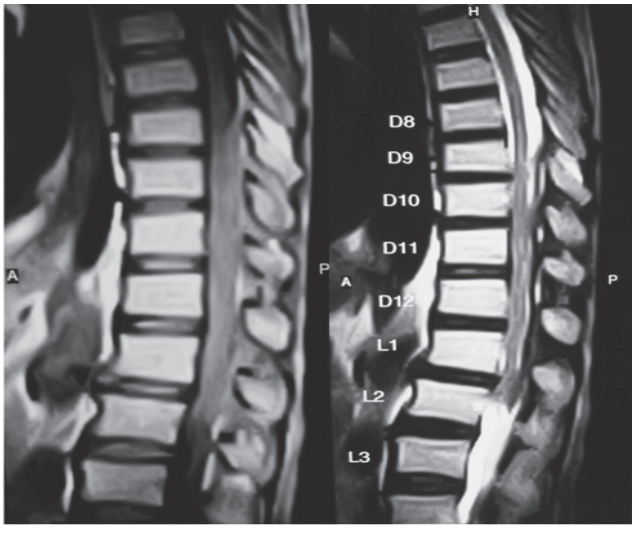

Figure 1. Dorsally placed extensive lesion from D9-L2 level.

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Figure 2. Extensively vascular and thickened dura.

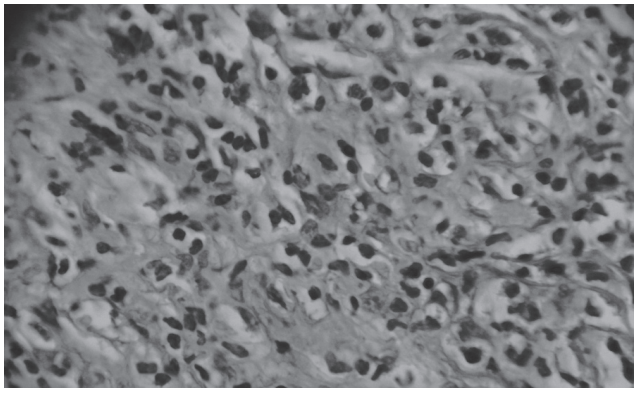

Figure 3. Histopathology showed that the tumor was a meningioma (H&E, 40x).

of ligamentum flavum hypertrophy was suspected. The patient underwent D9-L2 laminectomy. There was extensively vascular and thickened dura (Fig. 2). Because of an ill-defined plain of cleavage between the dura and the cord, the tumor could be excised partially. Histopathology was suggestive of meningioma (Fig. 3). There was no improvement in his neurological deficits.

DISCUSSION

En-plaque spinal meningioma though rare, but can involve dura extensively with significant neurological deficits.[4-7] These lesions can be suspected on computerized tomography (CT) and MRI and present as an unusual stratified architecture, with a conspicuous highly calcified component attached to the dura that may surround it posteriorly and laterally.[5] In our case, the imaging features were similar but we did not suspect this diagnosis. The surgical treatment of en-plaque meningioma is more complex than that of classic meningioma.[1,2,5] However, in patients with good plane of cleavage complete tumor removal is possible[1,2,5] and the wide dural defect can be closed with autologous fascia lata graft.[5] The difficulty may be due to the infiltration of surrounding structures and associated arachnoid scarring that may render complete resection difficult to achieve.[7-9] Spinal en-plaque meningiomas have a poorer prognosis than that of classic meningiomas with regard to the possibility of a definitive surgical cure.[1,4,5]

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Pancytopenia in Indian Children: A Clinico-hematological Analysis

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ABSTRACT

Objective: To determine the etiological profile of pancytopenia in pediatric patients in India. **Material and methods:** Medical records review of a 5-year period between 1st September 1997 and 31st August 2002. Clinical and hematological data of all patients with pancytopenia (hemoglobin [Hb] ≤10 g/dL, TLC ≤4 × 10^9/L, platelet count ≤150 × 10^9/L) at presentation were analyzed. Patients on cytotoxic chemotherapy, those developing pancytopenia during hospital stay, patients referred from other centers with hematological malignancies and neonates were excluded. **Results:** Forty-two children (mean age 8.26 years, range 8.5 months to 13 years, M:F : 1:0.8) were included. Megaloblastic anemia, aplastic anemia and infections were commonest causes, being responsible for 25%, 19.6% and 32.1% of the cases, respectively. Bone-marrow aspiration (BMA) was helpful in reaching a definitive diagnosis in 92.8% of those in whom sufficient marrow tissue was retrieved for analysis. Aplastic anemia was the commonest reason for failure of BMA in providing a diagnosis. **Conclusions:** Majority (almost 60%) of the causes of pancytopenia among pediatric patients in this region are easily treatable. There is a need to be aware of such conditions and appropriate investigative modalities should be undertaken for the same.

Keywords: Megaloblastic anemia, aplastic anemia, bone-marrow aspiration

Pancytopenia is the simultaneous presence of anemia (hemoglobin [Hb] less than the normal for age), leukopenia (total leukocyte count [TLC] <4,000 × 10^9/L) and thrombocytopenia (platelet count <150 × 10^9/L). It is a common clinical problem with an extensive differential diagnosis, but there is relatively little discussion of this abnormality in major pediatric and hematology textbooks.[1,2] Although a few authors have discussed it as a separate entity,[3] most of the discussion is centered on aplastic anemia, which is a relatively uncommon cause of pancytopenia in children. The lack of an optimal investigative approach to pancytopenia (especially the role of bone-marrow examination) has also been previously highlighted.[1] A wide variety of disorders can lead to pancytopenia but their relative frequency differs considerably between different age groups and different geographical areas.[1] Also, there have been very few systematic studies of pancytopenia.[1,4] Quite a few studies from India have been published on this topic, but none has addressed this issue in the pediatric age group.[5-8] We, therefore, retrospectively reviewed the medical records of 42 pediatric patients presenting with pancytopenia over a 5-year period, to determine the clinico-hematological characteristics of pancytopenia among pediatric patients in India.

MATERIAL AND METHODS

Pancytopenia was defined as Hb ≤10 g/dL, TLC ≤4,000 × 10^9/L and platelet count ≤150 × 10^9/L. The case-records of all the patients admitted in the Dept. of Pediatrics with an admitting diagnosis of pancytopenia over a 5-year period between 1st September 1997 and 31st August 2002 were reviewed. The records of the Hematology Division, Dept. of Pathology for the same period were also reviewed to identify all cases in which a diagnosis of pancytopenia was made at the time of admission. The details of clinical profile, hematological parameters (Hb, TLC and differential leukocyte count [DLC], platelet count, reticulocyte count, peripheral smear), and BMA and/or biopsy examination results were recorded in a structured proforma. In the Hematology Division, blood

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counts are performed on an automated counter and abnormal findings confirmed by a hematopathologist. All peripheral blood films, bone marrow aspirates (BMA) and/or trephine biopsies were processed as per standard techniques. Other investigations done (cultures of blood, body fluids and bone marrow; splenic aspiration, radiological examination, Mantoux testing, serological tests, etc.) were also recorded.

Children receiving cytotoxic chemotherapy and those developing pancytopenia during the hospital stay were not included. If a patient was admitted more than once, only the first admission record was included for analysis, although the final etiological diagnosis made was recorded. Records of the Neonatal Unit were not included. A total of 47 cases of pancytopenia were thus identified. Full blood counts at admission were available for all of them but counts at discharge and BMA/biopsy results were available for 45 and 42 cases, respectively (as they obtained discharge against advice or absconded prior to BMA).

RESULTS

Complete records of 42 children were analyzed. The mean age of the children was 8.26 years (range, 8.5 months to 13 years; median age, 9 years; mode, 7 years; M:F : 1:0.8). The underlying causes for pancytopenia in these children are tabulated in Table 1.

On statistical analysis, no significant difference was found between the major diagnostic categories (megaloblastic anemia, aplastic anemia and acute lymphoblastic leukemia [ALL]) with regards to sex, age at presentation, presenting complaints and initial hematological values. Megaloblastic anemia was the commonest cause of pancytopenia and responsible for one-fourth of the cases. It was due to folate deficiency in two cases, and vitamin B_{12} deficiency in one case. One patient with megaloblastic anemia passed *Ascaris* worms in stool during hospital stay. All patients with disseminated tuberculosis were over 8 years of age and all patients of kala-azar were residents of endemic areas.

Table 1. Underlying Causes in 42 Children Presenting with Pancytopenia

Diagnosis	Number of patients (%)
Megaloblastic anemia	10 (23.8)
Aplastic anemia	8 (19)
Acute lymphoblastic leukemia	6 (14.3)
Enteric fever	7 (16.6)
Kala-azar	4 (9.5)
Disseminated tuberculosis	4 (9.5)
Others	3*

*One case of non-Hodgkin's lymphoma, one cases of disseminated tuberculosis with associated enteric fever. One case was not diagnosed.

Aplastic anemia was responsible for 20% of the cases but no etiologic factors could be implicated in any of these children except three with probable heavy metal poisoning. Two of these were distant cousins working in a battery-manufacturing unit although they presented to the hospital 8-month apart. Another had received indigenous medicines (Unani medicine) for atopic dermatitis with sudden appearance of pallor and petechiae within a month of these medications. No other clinical evidence of heavy metal poisoning was noted in these three children.

BMA had been done in all 42 patients and was inconclusive in 6 patients only. Three of these had aplastic anemia (proved on bone-marrow biopsy) and one had kala-azar (proved on splenic puncture and serology, and responded to sodium antimony gluconate). The remaining two had evidence of disseminated tuberculosis elsewhere in the body but no supportive bone marrow findings; although, one had associated enteric fever. One responded to antitubercular therapy alone, and the other to antitubercular therapy in combination with antibiotics, respectively. Bone marrow biopsy was helpful in making the diagnosis in only 3 patients out of the 6 in whom it was conducted. However, it ruled out underlying aplastic anemia/aleukemic leukemia in the other 3 patients.

Six patients with aplastic anemia and 5 patients with ALL were referred to higher centers for management and 3 patients were lost to follow-up.

DISCUSSION

The results of this study show that pancytopenia can be the presenting feature of a wide variety of illnesses in the pediatric population of our country. Similar to the studies of pancytopenia in adults from India, majority of the patients had megaloblastic anemia, aplastic anemia and hematological malignancies. Although, kala-azar has previously also been reported to present with pancytopenia, disseminated tuberculosis and enteric fever were found to be responsible for a significant number of case (9.5% and 16.6%, respectively).

Megaloblastic anemia was the commonest cause of pancytopenia (23.8%) in this study similar to African reports and adults studies in our country.[1,5,6]

The proportion reported from the West has been much lower (7.5% in adults).[4] Savage et al[1] have reported megaloblastic anemia to be responsible for 35.8% of their 134 hospitalized African pancytopenic patients (age range, 1-73 years; median, 40 years). Among studies in adults in India also megaloblastic anemia is responsible for a significant proportion of pancytopenic patients that varies from 22.3% to 39%.[5-10] Tilak and Jain have however reported a very high proportion of 68% in adult pancytopenic patients.[8]

The cause of megaloblastic anemia could only be determined in 3 of our patients due to the nonavailability of facilities for estimating folic acid and B_{12} at our center. Most studies from India have suffered from this drawback.[5-9] Folic acid and B_{12} are reported to be responsible for similar proportion of pediatric patients with megaloblastic anemia in this region and treatment with a combined preparation of B_{12} and folic acid is an acceptable option.[9]

Although megaloblastic anemia was found to be the commonest cause of pancytopenia among children, a diagnosis of megaloblastic anemia should not be based on the presence of macrocytes on the peripheral smear alone, as this finding is not infrequently found in those with aplastic anemia and also acute leukemia. Similarly, Kumar et al found megaloblastic marrow in 5 patients with falciparum malaria and in 1 patient with enteric fever, who presented with pancytopenia.[5]

Aplastic anemia was the next most common cause (19%) of pancytopenia in this study. Savage et al also reported it to be the second most common cause (26.1%) of pancytopenia in their study. It was responsible for pancytopenica in 62.9% of patients aged below 21 years.[1] Kumar et al; however, found it to be the commonest cause (29.5%) of pancytopenia among adults at a hematology center, which may have been due to high proportion of referred cases at their center.[5] No etiologic factor could be implicated in majority of our cases with aplastic anemia.

Acute leukemia was seen in 6 cases, all of which had ALL. One patient had non-Hodgkin's lymphoma. During the period under review, 4 other patients with pancytopenia and leukemia were seen by us (3 ALL, 1 acute myeloid leukemia [AML]) but were not included for analysis. Eight percent of patients in a Zimbabwean study of adults and children had acute leukemia and these cases were often children.[1]

Hematological findings in kala-azar can include any or all of the findings of anemia, thrombocytopenia, neutropenia and pancytopenia.[10,11] Pancytopenia is caused by hypersplenism, hemolysis, plasma volume expansion, ineffective erythropoiesis and reticuloendothelial hyperplasia. Hemophagocytic syndrome and trilineage myelodysplasia have also been reported as a complication of this illness.[10,12] All the patients with kala-azar in this study came from endemic areas, had history of prolonged fever with a massive splenomegaly, and the diagnosis was clinically suspected prior to bone marrow examination. One patient did not demonstrate Leishman-Donovan (LD) bodies on BMA and had to undergo splenic puncture. Kumar et al reported kala-azar in 4% of their patients; this low frequency could again have been due to the referral nature of their patients.[5]

The two unusual findings observed in this study were the previously unreported high proportion of pancytopenia due to enteric fever and tuberculosis (16.6% and 9.5% of the cases). In patients with tuberculosis, various hematological abnormalities including anemia, lymphocytopenia, thrombocytopenia, leukopenia, pancytopenia, etc. have been described. The commonest of these among Indian patients with disseminated tuberculosis has been reported to be anemia (present in 84%).[13]

In the same study, pancytopenia was found in 19% of the patients with disseminated or miliary tuberculosis. The various postulated mechanisms for pancytopenia include splenic sequestration, immune-mediated bone marrow depression and malnutrition.[13] The presence of a granuloma on bone marrow had no relationship with the occurrence of pancytopenia in previous studies.[13,14] Contrary to these reports; we found granulomas in 3 of the 4 patients with disseminated tuberculosis and pancytopenia. One other case of disseminated tuberculosis had associated enteric fever, thus pancytopenia could not be ascribed to any single condition. There was no granuloma on BMA but the child improved with antitubercular therapy in combination with specific therapy. The suggested conclusive proof of tuberculosis-induced pancytopenia is the resolution of both tuberculosis and pancytopenia with antitubercular therapy.[14]

Another patient had pulmonary tuberculosis with absence of any diagnostic finding on BMA. He was discharged on request prior to bone marrow biopsy and was lost to follow-up. Merely the presence of pulmonary tuberculosis in this child did not justify labeling it as the cause of pancytopenia. In a previous series also, none of the patients with pulmonary tuberculosis had pancytopenia.[10]

As tuberculosis is quite common in our country, it may be coincidentally present in quite a few patients of pancytopenia. Presence of pancytopenia and disseminated tuberculosis in a pediatric patient does not therefore imply causation, and BMA or biopsy should demonstrate granuloma to definitively ascribe pancytopenia to be because of the tubercular infection. Kumar et al reported only 1 patient with disseminated tuberculosis out of 166 adult patients with pancytopenia and diagnosis was made only on a post-mortem liver biopsy.[5]

Isolated cytopenias, bicytopenias and pancytopenia in enteric fever are well-documented in literature.[15,16] Multidrug-resistant *Salmonella typhi* (MDRST) are reported to be more commonly associated with hematological findings. Around 84% of the pediatric patients with enteric fever at our center are found to be suffering from MDRST. Bone marrow histiocytic hemophagocytosis has been reported to be a cause for pancytopenia in enteric fever,[16] but was not found in any of our cases. Bone marrow hypocellularity was observed in 3 (43%) of the 7 patients with pancytopenia associated with enteric fever. In others, probably a peripheral mechanism for pancytopenia was operating. None of the children had been receiving chloramphenicol or any other bone marrow depressant. Studies in adults have also reported similar findings.[15]

BMA was extremely helpful in reaching a definitive diagnosis in a majority (92.3%) of those where sufficient marrow tissue was retrieved for analysis. It was inconclusive in only 6 (14.3%) cases; in 3 of which, sufficient marrow tissue was not available by aspiration (all aplastic anemia) and in three others, no diagnostic information could be provided after the examination.

In these 3 also, a primary marrow involvement was ruled out after the marrow examination. Bone marrow biopsy was most helpful in cases of aplastic anemia, where it was diagnostic in all the 4 cases in which it was done (after aspiration was inconclusive). Although BMA has been reported to be inconclusive in up to 38% of adult patients in one series, and simultaneous aspiration and biopsy have been recommended to overcome this problem,[5] we find ourselves unable to concur with this for pediatric patients. Bone marrow biopsy is definitely a more painful procedure than BMA, and subjecting every child with pancytopenia to it does not seem justified in the light of results from this study.

On the other hand, certain authors are of the opinion that BMA is not even needed in certain pancytopenic patients e.g., those with hypersegmented neutrophils on peripheral smear and, those with mild pancytopenia, splenomegaly, an unremarkable blood film and a known cause of portal hypertension.[1] In our opinion, the recommendations of Savage et al[1] seem more appropriate for pediatric patients in our country especially in the setting, where BMA is not feasible. However, at centers where facilities are available, BMA remains a simple test, which not only clears the diagnostic confusion but also rules out the more serious primary marrow involvement like malignancies and aplastic anemia.

This study shows that megaloblastic anemia and infections (kala-azar, enteric fever and tuberculosis), both of which are eminently treatable, cause nearly 60% of the pediatric cases presenting with pancytopenia in this region. This is contrary to the widespread perception of acute leukemia and aplastic anemia as the most common etiologic factors, with their associated poor prognostic implications. It is important to be aware of these conditions as a frequent cause of pancytopenia, so that prompt and appropriate investigative and therapeutic measures can be instituted and a uniformly poor prognosis is not communicated to the relatives.

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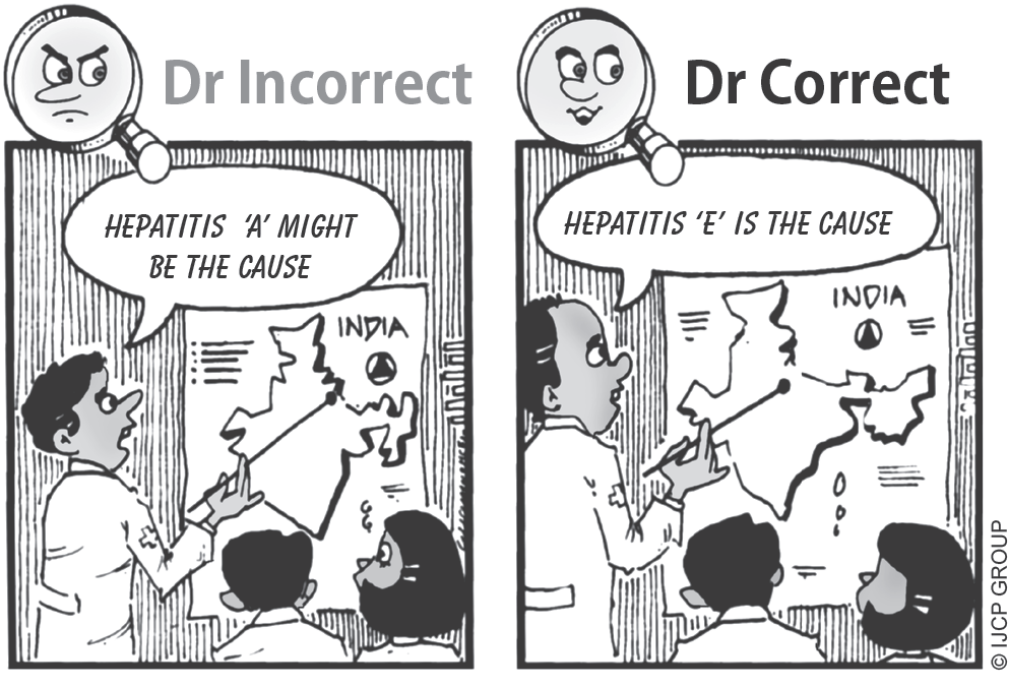
Dr Correct & Dr Incorrect

SITUATION : There was an epidemic of Hepatitis in India.



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Cotton Bezoar Causing Intestinal Obstruction

JAGANNATH KULKARNI*, SANJIV KUMAR GOYAL*, GIRISH SINGLA*

ABSTRACT

Background: The unusual urge to eat cotton fibers is usually seen in people whose mental health is affected. Presentation could be in the form of trichophagy (eating hair), followed by trichobezoar or phytobezoar (eating vegetable fibers), which is a rare entity. Rapunzel syndrome is a term for trichobezoar where the parent bezoar is in the stomach and a tail of the fibers or hair extends into the jejunum. Presentation as gastric outlet obstruction due to a cotton bezoar in the stomach and intestine is rare, hence we report it here. **Case report:** A 60-year-old gentleman with no known comorbidities presented to the emergency room with history of pain abdomen, vomiting and loss of weight. Ultrasound followed by CT abdomen and pelvis revealed features of gastric outlet obstruction due to foreign body. On emergency exploratory laparotomy after initial resuscitation, he was found to have a large gastric cotton bezoar possibly extending into the proximal jejunum. The bezoar was extracted via gastrostomy and on-table enteroscopy confirmed complete evacuation of the bezoar. On postoperative Day 5, patient was discharged on soft diet. **Conclusion:** Gastrointestinal bezoars are a rare entity, and when cotton is the nature of bezoar with possible gastric outlet obstruction Rapunzel syndrome, it qualifies for inclusion into the literature.

Keywords: Cotton bezoar, Rapunzel syndrome, gastric outlet obstruction

Stomach bezoars if detected in time may be treated by endoscopic retrieval but if presentation is in the form of intestinal obstruction with or without perforation management is by a formal exploratory laparotomy followed up by treatment for the underlying psychiatric disorder.[1,2] Bezoars are rare and are often reported in patients with some psychiatric ailment.[3,4] They usually present with signs and symptoms due to a mass in the stomach, which may rarely extend into the jejunum as a tail (Rapunzel syndrome).[1,5,6] Such instances where in an elderly male patient presents to the Emergency Room (ER) with signs of gastric outlet obstruction due to cotton bezoar and successful management surgically is rare in literature.

CASE REPORT

A 60-year-old gentleman with no known comorbidities was brought to the ER with history of pain abdomen recurrent episodes of vomiting for 4 days. On examination, he appeared dehydrated, his heart rate (HR) - 98 bpm, blood pressure (BP) - 130/80 mmHg, conscious and oriented. Per abdominal examination revealed vague palpable mass and signs of gastric outlet obstruction. Per-rectal examination had empty rectum and no growth was palpated. Other systems examination was normal.

He was resuscitated in ER with IV fluids, antispasmodics, antiemetics and was started on broad-spectrum IV antibiotics. Blood samples were sent for all the preoperative values. Baseline ECG, X-ray chest was done. Ryle's tube aspiration was started and a Foley's catheter was placed.

Ultrasound followed by CT abdomen showed features of gastric outlet obstruction possibly due to a foreign body. The patient underwent emergency exploratory laparotomy. Gastric palpation suggested foreign body and on gastrotomy (Fig. 1) a large and a long band/ball of cotton fibers was seen. After complete extraction of the bezoar, it was found to measure 2.4 feet in length and was made up of varying girths and colors of cotton fibers (Fig. 2).

On table enteroscopy via the gastrotomy confirmed complete extraction of the bezoar. Gastrotomy and abdomen were closed with drain. He improved over a period of 3 days after the surgery and was taking liquids on post-op Day 3. He was started on soft diet on post-op Day 5 and discharged on post-op Day 6 in stable condition.

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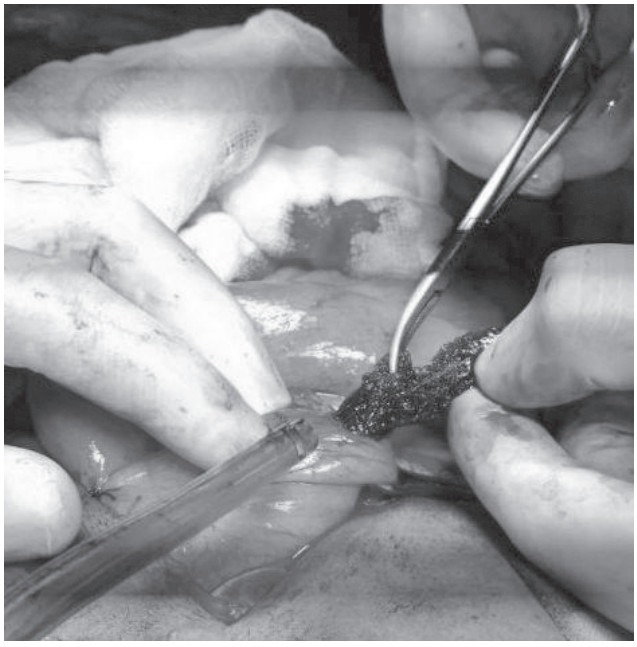

Figure 1. Gastrotomy and extraction of bezoar.

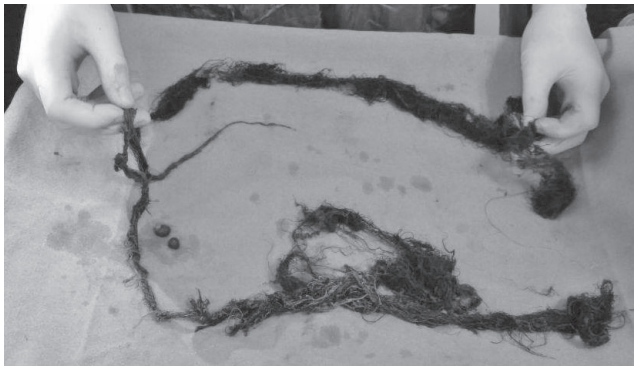

Figure 2. Cotton bezoar measuring 2.4 feet.

DISCUSSION AND CONCLUSION

Around 400 cases of trichobezoar and a larger number of phytobezoars have been reported in the literature but many go unreported.[1,4] They occur mainly in the young women who chew and swallow their hair (trichobezoar) or phytobezoar (vegetable fibers) or diospyrobezoar (persimmon fibers) or pharmacobezoar (tablets/semi-liquid masses of drugs).[3,6,7] With time, these are retained by mucus and become enmeshed, creating a mass in the shape of the stomach where they are usually found. They may attain large sizes owing to the chronicity of the problem and delayed reporting by the patients.

The term bezoar comes from the Arabic "badzehr" or from the Persian "panzer" both meaning counter poison or antidote.[4,5] Hindus used bezoars in the 12th century BC for rejuvenating the old, neutralizing snake venom and other poisons, treating vertigo, epilepsy, melancholia and even plague. A genuine bezoar was recognized by its failure to smoke when a red-hot needle was plunged into it.[3,5,6]

Causes of bezoar include the presence of indigestible material in the lumen, gastric dysmotility (including previous surgery like vagotomy and partial gastrectomy, etc.) and certain other substances that encourage stickiness and concretion formation. The clinical presentation may be a palpable, firm, nontender epigastric mass, which is either discovered, on routine physical examination in an asymptomatic patient. Bezoars have been reported between the ages of 1 and 56 years, most presenting between the ages of 15-20 years and 90% are in females. Approximately 10% show psychiatric abnormalities or mental retardation.[1]

Rarely, the bezoars may extend into the small intestine as a tail (Rapunzel syndrome after "Rapunzel" the fair, long haired maiden in the Grimm brother's fairy tail who lowered her tresses to allow Prince charming to climb up to her prison tower to rescue her) or may get broken lodging in the intestine to cause intestinal obstruction, ulceration, bleeding and perforation. Small intestinal bezoars have also been reported after truncal vagotomy and with compression of the duodenum by the superior mesenteric artery.[8]

Bezoars mostly originate in the stomach and are probably related to high fat diet causing non-specific symptoms like epigastric pain, dyspepsia and postprandial fullness; the stomach is not able to push the hair/cotton or other substance out of the lumen because the friction surface is insufficient for propulsion by peristalsis.[3,5,6] They may also present with gastrointestinal bleeding (6%) and intestinal obstruction or perforation (10%).[3,5,6] Diagnosis at an early stage is important since conservative treatment (fragmentation and endoscopic extraction, enzymatic destruction) is possible for gastric bezoars.

If available, endoscopic examination of the stomach is the preferred method of exploring the stomach for the concomitant bezoar while managing a case of intestinal bezoar. Exploration may reveal concomitant gastric bezoar, which may be retrieved endoscopically or by gastrotomy.[7] Escamilla et al reported 23 cases of concomitant gastric bezoars (extracted by gastrotomies) out of 87 cases of intestinal bezoars.[7] If detected in the intestine, they may be milked down to the enterotomy site for retrieval through one opening or they may require multiple enterotomies.

Treatment is removal of the mass by a single enterotomy or resection of the bowel if not viable.[2,7] Duncan et al

recommended bezoar extraction by multiple enterotomies in the Rapunzel syndrome.[9] DeBakey and Ochsner reported an operative mortality of 10.4%.[10] It is mandatory to do a thorough exploration of the rest of the small intestine and the stomach to look for retained bezoars.[11]

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Mid-cavity Obstruction of Right Ventricle Without Any Other Congenital Anomaly

SR MITTAL

A 7-day-old female infant born of full-term normal delivery was referred for evaluation of a systolic murmur in left lower parasternal region. Electrocardiogram (ECG) revealed P-pulmonale with right axis deviation and prominent RS configuration in lead V_1 (Fig. 1). Echocardiography revealed hypertrophy of right ventricle with a systolic turbulent jet between apex and main cavity of right ventricle (Fig. 2). Continuous wave Doppler evaluation of the jet revealed a systolic gradient of 65.4 mmHg (Fig. 3). Pulmonary valve was normal. Pulsed wave Doppler evaluation of pulmonary flow was normal with a peak velocity of 0.87 m/sec and peak gradient of 3 mmHg (Fig. 4). Tricuspid leaflets were normal with mild tricuspid regurgitation. Left ventricle, mitral valve flow, left ventricular outflow tract and aortic flow were normal. There was no other congenital anomaly.

Echocardiography findings of this case resemble left ventricular mid-cavity obstruction seen in some cases of hypertrophic cardiomyopathy. Isolated right ventricular hypertrophy with hypertrophied muscle bundles created gradient between apex and cavity of right ventricle. Such hypertrophied obstructive muscle bundles in the cavity of right ventricle are invariably associated with other congenital anomalies like ventricular septal defect, pulmonary valve stenosis, discrete subaortic stenosis, Ebstein malformation or tetralogy of Fallot. Our case could be a variant of hypertrophic cardiomyopathy. Parents did not agree for any other investigation, chromosome analysis or evaluation of other family members. Patient was first issue and parents denied any history of cardiac disease or sudden death in close relation.

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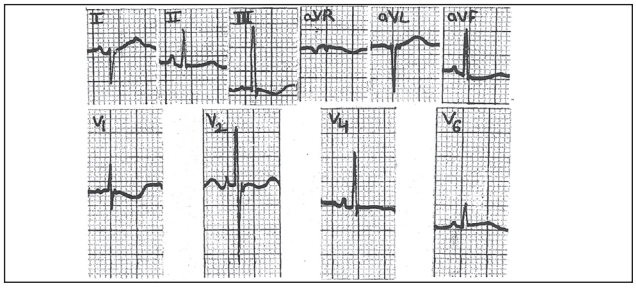


Figure 1. ECG showing right axis deviation, P-pulmonale and R/S configuration in lead V_1.

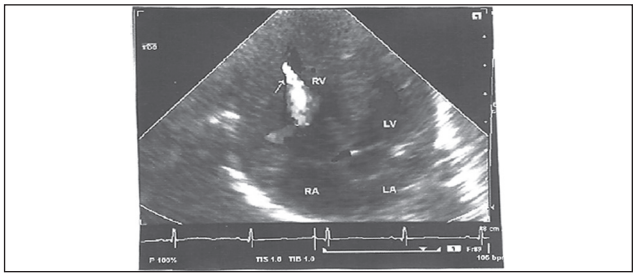


Figure 2. Color Doppler echocardiograph in apical four-chamber view showing turbulent jet coming from RV apex to RV cavity.

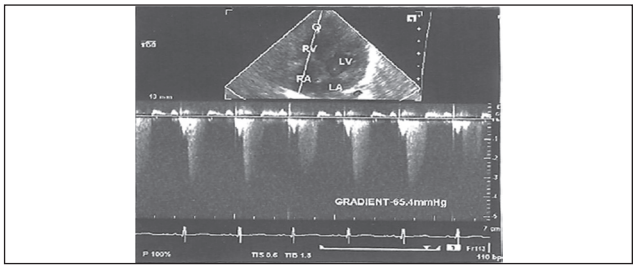


Figure 3. Continuous wave Doppler showing gradient across the turbulent flow.

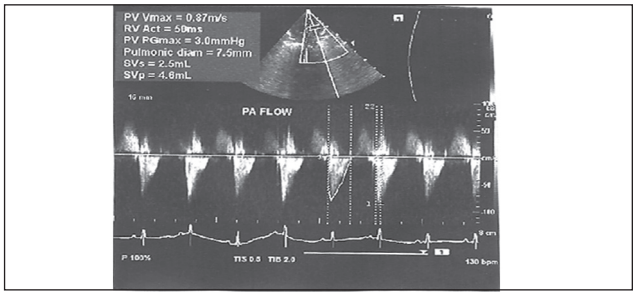
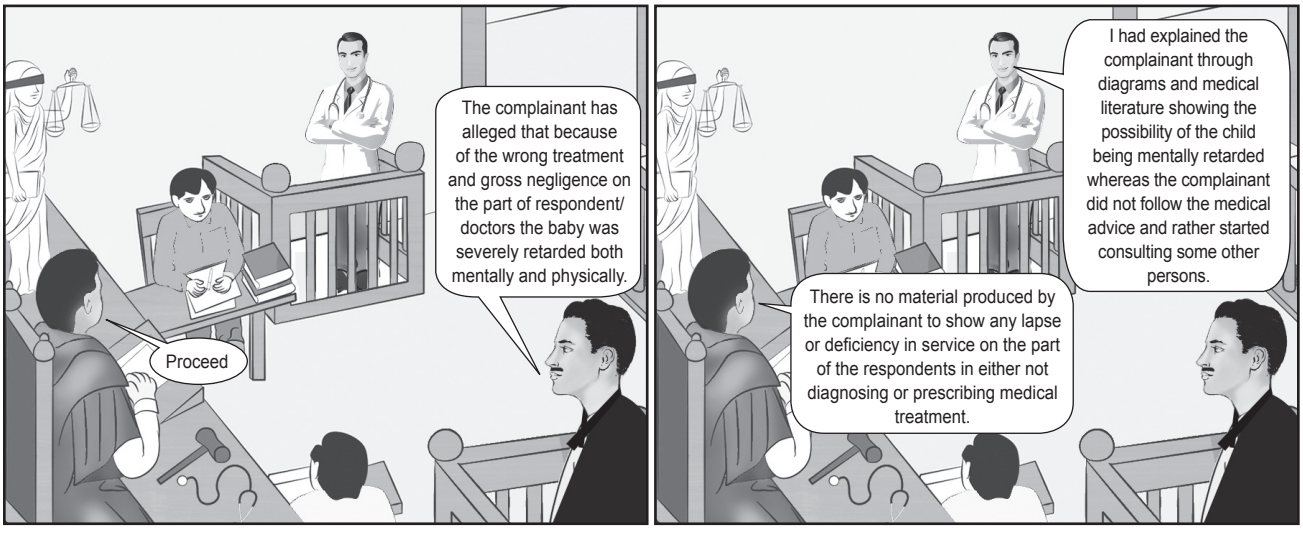


Figure 4. Pulsed Doppler evaluation of pulmonary artery flow.

Onus to Prove Medical Negligence or Deficiency Lies on the Complainant



Lesson: In its order in the First Appeal No. 490 of 2007 NCDRC stated that the appellant has not been able to prove through any credible evidence that there was medical negligence or deficiency on the part of the respondents or any action or omission on their part which resulted in or aggravated the congenital condition of the infant. On the other hand, there is credible evidence that right through the prenatal period and after the birth due medical attention and proper treatment was given by both respondents who are well-qualified specialists in their fields. We agree with these findings and therefore, uphold the order of the State Commission. The first appeal is dismissed.

COURSE OF EVENTS

- This first appeal has been filed by the complainant before the State Commission and appellant herein, being aggrieved by the order of the State Consumer Disputes Redressal Commission, Delhi (hereinafter referred to as the 'State Commission') which has rejected his complaint of medical negligence against Respondents No. 1 and 2, respectively.
- In his complaint to State Commission, appellant had contended that his wife delivered a male child at Shubham Hospital, New Delhi and the delivery was handled by Respondent No. 1 who was a Gynecologist and thereafter by Respondent No. 2, a Pediatrician.
- The appellant had alleged that because of the wrong treatment and gross negligence on the part of respondent/doctors the baby was severely retarded both mentally and physically.
- The appellant had specifically stated that his wife who was suffering from fever in her 32-34 weeks of pregnancy had visited Respondent No. 1 who failed to conduct a basic test known as TORCH test, which would have clearly indicated the nature of the prenatal viral infection and whether it had infected the fetus. Instead the patient was given only paracetamol to check the fever.
- The baby was born after 36 weeks of gestation i.e., 4 weeks before the full gestation period with symptoms of the present disease but he was not given the required medical treatment at birth as a result of which, as per the certificate issued by the All India Institute of Medical Sciences (AIIMS) in 1996, he has cerebral palsy with spastic tendencies, mental retardation and 90% permanent physical impairment.
- The certificate from AIIMS specifically stated that the perinatal viral infection was the cause of this condition. If due medical treatment had been

given at birth instead of just tonics and vaccines by Respondent No. 2, appellant contended that the extent of disability would not have been so extensive.

- Appellant, therefore, approached the State Commission on ground of medical negligence and requested that respondents be directed to pay him ₹ 15 lakhs as compensation for mental agony and to enable him to provide the necessary treatment for his child.
- Respondents filed a written rejoinder denying that there was any medical negligence in the care and treatment of the appellant's wife and infant.
- The appellant's wife approached Respondent No. 1 for prenatal treatment for the first time in December, 1991 and she was accordingly advised necessary tests including ultrasound and no abnormalities were detected.
- In her 32-34 weeks of pregnancy the appellant's wife had fever and was prescribed crocin to control the fever and no other drug.
- Growth retardation of the baby was noted at 34-35 weeks and the appellant's wife was advised bed rest.
- The appellant's wife was brought to the hospital in the 36th week in advanced labor and delivery took place within 1 hour with the umbilical cord wound thrice around the baby's neck and he had passed meconium because of which there was difficulty in spontaneous initiation of breathing at birth but the baby was successfully resuscitated within 2 minutes with normal Apgar count. Since, the baby was small for date, he was kept in a thermoneutral environment under an oxygen hood and prescribed prophylactic antibiotics and also medication for the mild jaundice which is common in newborns.
- The baby was discharged on 24.06.1992 in a suitable condition.
- On 03.07.1992, the baby was brought to the hospital with complaints of vomiting, lethargy and disinterest in suckling and Respondent No. 2 after examining him advised hospitalization, which was not accepted by the appellant who thus acted against medical advice.
- On 01.08.1992 during another visit, spastic tendencies were visible and Respondent No. 2 explained the medical condition as also the prognosis to the parents and advised them to bring the baby for follow-up visit within 7 days but the baby was brought only after 21 days in poor medical condition. Amoxicillin for 10 days was prescribed but the parents discontinued the antibiotics after 3 days. Thereafter, the parents never brought the child to the respondent and probably got him treated elsewhere. There was thus no medical negligence in the treatment of either the mother or the baby and it was the appellant and his wife who repeatedly failed to follow medical advice.
- It was also contended that the first appeal was time barred as it was filed beyond the statutory period of 2-year from the date on which the cause of action had arisen.

ORDER OF THE STATE COMMISSION

- The State Commission after hearing both parties and on the basis of evidence filed before it concluded that no case of medical negligence was made out. The relevant part of the order of the State Commission is reproduced:

Here is a case where the child was born at 36 weeks gestation on 16-06-1992. The last when the complainant contacted the OP was till 15, September, 1992. The child subsequently has been diagnosed as suffering from cerebral palsy in 1996, which is indication of mental retardation. The complainant was advised hospitalization of the child but he declined. Medical treatment prescribed was not followed. There is no cure for cerebral palsy. TORCH test is prescribed only if the mother is suffering from such fever in the first 12 weeks of pregnancy and not 34 weeks of pregnancy. Giving PCM (Paracetamol) to a mother who is in 34 weeks of pregnancy is absolutely safe and by no means can cause any kind of infection or abnormality to the child. The mental retardation of the child cannot be projected in the ultrasound examination. Merely because the child was born underweight is known as SFD (Small for Date).

The OP contended that the doctor had explained the complainant through diagrams and medical literature showing the possibility of the child being mentally retarded, whereas the complainant did not follow the medical advice and rather started consulting some other persons. There is no material produced by the complainant to show any lapse or deficiency in service on the part of the OPs in either not diagnosing or prescribing medical treatment as is apparent from the aforesaid contentions. …..…….. The child was born with umbilical cord surrounding its neck. Though we have all the sympathy for the complainant but the aforesaid facts do not make out a case of medical negligence or any deficiency in service on the part of the

OP Hospital or doctors and they cannot be held liable for any lapse or negligence during or after delivery of the child. The complaint is dismissed being devoid of substance.

Hence, the present first appeal.

ALLEGATIONS OF COMPLAINANT

Appellant who was present in-person and Counsel for Respondents made oral submissions.

- Appellant reiterated that if proper tests including the TORCH test had been conducted, the type of viral infection from which both the mother and the fetus had been obviously infected would have been detected and the mother could have been given proper medication instead of only crocin and the baby could have been given the medical attention required in such cases at birth instead of only antibiotics and tonics.
- The certificate from AIIMS clearly indicated that the condition of the child, who unfortunately is no more, was because of the perinatal viral infection. If proper medication had indeed been given immediately in all possibility the retardation would have been checked at birth instead of increasing over the years.
- Appellant apprehended that there was every possibility that the mother was given certain medications which were contraindicated though on a specific query from us, he could not state what other medicines were given.

REJOINDER OF RESPONDENTS

- Counsel for respondents on the other hand stated that both respondents are well-qualified doctors with specializations in Gynecology and Pediatrics, respectively.
- Respondent No. 1 took due care during the pregnancy and right in the beginning various tests including ultrasound were conducted which could have revealed some growth problem but not spastic tendency or cerebral palsy because spastic tendencies cannot be diagnosed in a fetus.
- The fever which occurred in the 32-34 weeks of the pregnancy in the mother cannot cause fetal malformation, which can occur if the mother contracts an infection in the first trimester i.e., 12 weeks of the pregnancy.
- Since an ultrasound had confirmed that the fetus was small for date, as per medical practice, respondent planned to induce labor but before this could be done, the appellant's wife herself delivered 1 month prematurely with only 1 hour of labor pains.
- On birth, the infant was in respiratory distress because the umbilical cord was bound thrice round his neck and he had passed and swallowed meconium in the womb. He was immediately resuscitated, stabilized and put in intensive care and prescribed antibiotics and treated with other medication for mild jaundice and discharged thereafter in a stable and satisfactory condition.
- It was the appellant and his wife who failed to heed correct medical advice during subsequent follow-up visits by not agreeing to hospitalization of the baby and also not giving antibiotics for the prescribed period.

OBSERVATIONS OF NCDRC

We have heard the appellant and the Counsel for respondent and have carefully gone through the evidence on record.

- We note from the record that as observed by the State Commission due care was taken in the prenatal care of the appellant's wife by Respondent No. 1 and necessary tests were conducted.
- Appellant's contention that there was negligence in not conducting the TORCH test when the appellant's wife contracted fever between 32-34 weeks of pregnancy is not borne out by the medical literature on the subject according to which a TORCH test is prescribed within first 12 weeks of pregnancy in case the mother is suffering from fever because this is the period when fetal malformation can occur due to certain infections (Reference: American Pregnancy Association and MCRCK, manual on high risk pregnancy risk factors).
- Admittedly, the appellant's wife suffered from fever only a few weeks before the delivery and she was given paracetamol, which is not contraindicated.
- While it is a fact that the child was born with cerebral palsy and related problems, as per the medical literature, this could not have been detected in the womb or caused because of any medication or wrong treatment when the appellant's wife had fever just prior to her delivery.
- Since the fetus was small for date, due care was taken and a few days after the birth when covert symptoms of cerebral palsy disease became apparent, appellant and his wife were immediately advised about the problem and also given a prognosis.

OPINION OF NCDRC

Appellant has not been able to prove through any credible evidence that there was medical negligence or deficiency on the part of the respondents or any action or omission on their part which resulted in or aggravated the congenital condition of the infant. On the other hand there is credible evidence that right through the prenatal period and after the birth due medical attention and proper treatment was given by both Respondents who are well-qualified specialists in their fields. Further, the certificate from AIIMS on which the appellant has relied was given some years later and only a question mark was put regarding the cause of the cerebral palsy being the prenatal viral fever from which the appellant's wife suffered and it was not a definite opinion on the same.

ORDER OF NCDRC

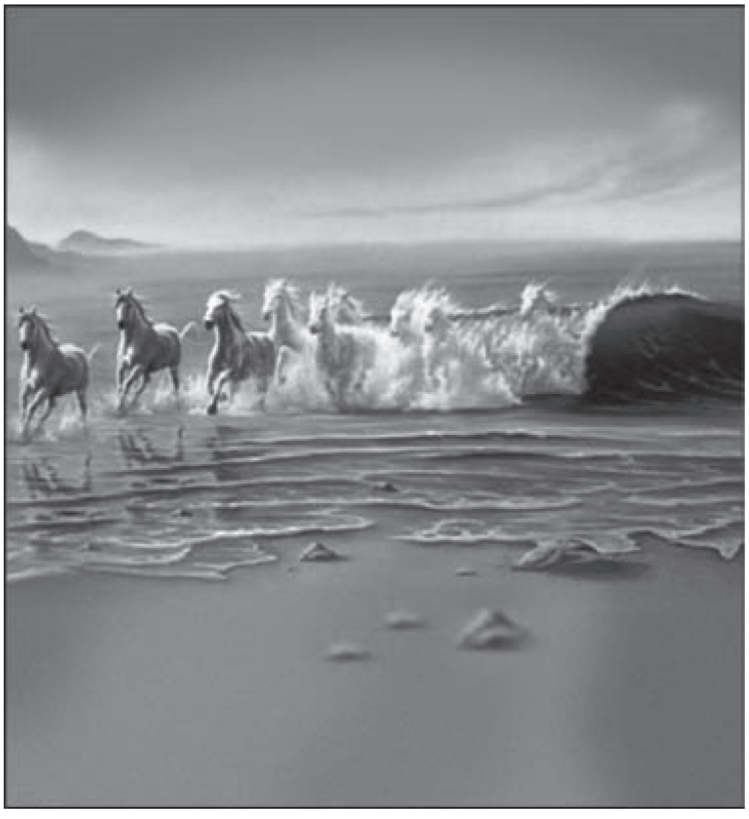
The State Commission has carefully considered all these aspects and has given a well-reasoned order concluding that the appellant has not been able to prove that this was a case of medical negligence or that there was any deficiency in service on the part of the respondents. We agree with these findings and therefore, uphold the order of the State Commission. The first appeal is dismissed with no order as to costs.

Reference

1. Case no. 490 of 2007; Order date 13.09.2012.

■■■■

Different Perspectives of Life



J The unreal may look real. There are only three real horses.

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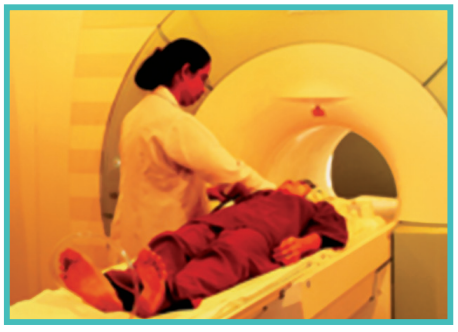
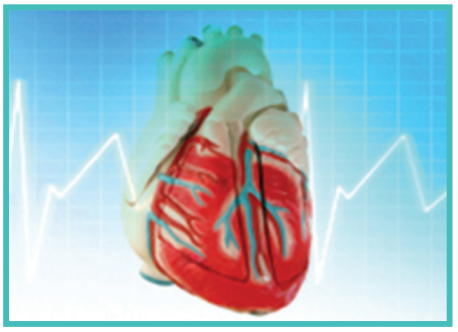


Radiology & Imaging Facilities



Cardiology Facilities Laboratory

Other Facilities

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Audiometry

Corporate Office

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News and Views

Union Health Minister Chairs High Level Review Meeting on Leprosy and TB

Union Minister for Health and Family Welfare, Shri JP Nadda has directed for a comprehensive strategy for addressing incidence, prevalence and surveillance aspects to eliminate leprosy at the district level. Chairing a high level review meeting on Leprosy and Tuberculosis (TB), the Health Minister also asked the officials to take up new interventions in areas where the prevalence is high and mount aggressive Information, Education and Communication (IEC) campaigns to enhance awareness on prevention and control of leprosy in the states, and to destigmatize leprosy. He further said that there is an urgent need for creating awareness in the community and was of the view that 'TB Champions' who survived TB, may be identified to raise awareness about TB in various states… (*Press Information Bureau, Ministry of Health and Family Welfare, April 17, 2018*).

Evening People at Greater Risk of All-cause Mortality

All-cause mortality is 10% higher in people who prefer evenings over mornings 'evening chronotypes', says a study published online April 11, 2018 in the journal *Chronobiology International*. Respiratory, digestive, neurological and/or psychological conditions were more common in these individuals as was diabetes.

New ASCO Guidelines for Metastatic Prostate Cancer

According to new clinical practice guideline from American Society of Clinical Oncology (ASCO), androgen deprivation therapy (ADT) administered along with docetaxel or abiraterone in patients with newly diagnosed metastatic non-castrate prostate cancer is associated with better survival vs. ADT alone. The guidelines are published April 2, 2018 in the *Journal of Clinical Oncology*.

Study Suggests Tumor Mutational Burden as a New Biomarker for Lung Cancer

The results of a trial published online April 16, 2018 in the *New England Journal of Medicine* show that in patients with advanced non–small-cell lung cancer (NSCLC) and a tumor mutational burden of at least 10 mutations per megabase, first-line treatment with nivolumab *plus* ipilimumab was associated with longer progression-free survival than chemotherapy.

Patients with HIV Infection at Risk of PAD

Patients with human immunodeficiency virus (HIV) infection have a 19% increased risk of peripheral artery disease (PAD). These results from the Veterans Aging Cohort Study (VACS) published March 13, 2018 in *Circulation*. Persons with sustained CD4 cell counts <200 cells/mm^3, the risk of incident PAD events is nearly doubled. All patients diagnosed with juvenile idiopathic arthritis (JIA) should be screened for uveitis with a current audited protocol, according to consensus-based recommendations from the SHARE (Single Hub and Access point for pediatric Rheumatology in Europe) Initiative published March 28, 2018 in the *Annals of the Rheumatic Diseases*.

Mosquito-packed Drones Soon to Join Fight Against Zika and Other Deadly Diseases

Robotics may soon be a critical ally in the fight against disease-spreading bugs, after a successful test releasing sterile mosquitos from aerial drones as part of efforts to suppress the insect that spreads Zika and other diseases. The drone-based mechanism overcomes a critical bottleneck in the application of Sterile Insect Technique (SIT) to control insect pests, said the UN International Atomic Energy Agency (IAEA), which developed the system in partnership with the UN Food and Agriculture Organization (FAO) and the non-profit group WeRobotics. SIT, a form of insect birth control, uses radiation to sterilize male mosquitos, which are then released to mate with wild females. As these do not produce any offspring, the insect population declines over time. However, to be effective, the technique requires the uniform release of large numbers of insects in good condition over a given area. For instance, Aedes mosquitos, responsible for the spread of diseases like dengue or yellow fever, do not disperse for more than 100 meters in their lifetime. They are also fragile, and high-altitude releases by airplanes—often used in the application of SIT for other insects—can damage their wings and legs. The drone-based system overcomes this problem… (*UN, April 19, 2018*)

A Single Concussion may Increase Risk of Parkinson's Disease

A study published April 18, 2018 in *Neurology* says that patients with mild concussion, or mild traumatic brain

injury have a 56% higher risk of developing Parkinson's disease. The study defined mild traumatic brain injury as loss of consciousness for up to 30 minutes, alteration of consciousness of a moment to 24 hours or amnesia for up to 24 hours.

Coffee Safe in Some Patients with Arrhythmias

Many clinicians advise patients with atrial or ventricular arrhythmias to avoid caffeinated beverages, according to a review published April 16, 2018 in *JACC: Clinical Electrophysiology*. Caffeine doses up to 500 mg daily (equivalent to six cups of coffee) did not increase the severity or rate of ventricular arrhythmias. However, patients with a prior heart disease should avoid energy drinks.

Once-daily Triple Therapy with Fluticasone Furoate + Umeclidinium + Vilanterol Reduces COPD Exacerbations

A decline in the frequency of moderate or severe chronic obstructive pulmonary disease (COPD) exacerbations along with fewer hospitalizations was observed after once-daily triple therapy with fluticasone furoate (inhaled glucocorticoid) + umeclidinium (long-acting muscarinic receptor antagonist) + vilanterol (long-acting beta-agonists) as compared to dual therapy with fluticasone furoate + vilanterol or umeclidinium + vilanterol. The study is published April 18, 2018 in the *New England Journal of Medicine*.

Study Shows Artificial Pancreas as Effective Treatment for Type 1 Diabetes

A review of published evidence has concluded that as compared with standard treatment, artificial pancreas helps to achieve better glycemic control in patients with type 1 diabetes with 2.5 extra hours of normoglycemia daily and reduced hyperglycemia and hypoglycemia. These findings are published April 18, 2018 in the *BMJ*.

Antipsychotic Drugs Associated with Free Thyroxine Levels

Findings of a study presented April 5, 2018 at the Schizophrenia International Research Society (SIRS) 2018 Biennial Meeting in Florence, Italy show low free thyroxine (FT4) levels with the use of antipsychotic drugs such as olanzapine and quetiapine.

FDA Safety Alert About 24-hour Multipatient Endoscope Connectors

In a safety alert, the US Food and Drug Administration (FDA) has cautioned about the risk of cross-contamination from 24-hour multi-patient use endoscope connectors that are used without reprocessing. The FDA has advised healthcare providers and facilities to use single-use endoscope connectors with backflow prevention features, or use reusable endoscope connectors with backflow prevention features, and ensure that those reusable connectors are reprocessed according to their instructions for use prior to each patient procedure.

Risk of Stroke Increases with the Number of Cigarettes Smoked

A new study published April 19, 2018 in the journal *Stroke* reports that men younger than 50 years who smoked were 88% more likely to have a stroke compared to men who never smoked. Quitting smoking is the ultimate goal, but risk of stroke can be decreased by reducing the number of cigarettes smoked, say researchers.

Walking Fast Reduces Hospitalizations in Patients with Heart Disease

Walking fast results in fewer hospitalizations for patients with heart disease, according to research presented April 20, 2018 at EuroPrevent 2018, a European Society of Cardiology congress at Ljubljana, Slovenia. Fifty-one percent of slow walkers had at least one hospitalization vs. 44% of the intermediate walkers and 31% of the fast walkers.

Noninvasive Nerve Stimulation may Help with Hand Tremor

Noninvasive peripheral neuromodulation via a wrist-worn neuromodulation device provides symptomatic relief to people with essential tremors in their hands, according to a study to be presented at the American Academy of Neurology's 70th Annual Meeting in Los Angeles, April 21 to 27, 2018.

ACIP Recommends Heplisav-B Vaccine to Prevent Hepatitis B Infection

The Advisory Committee on Immunization Practices (ACIP) says that Heplisav-B (HepB-CpG), a yeast-derived hepatitis B vaccine made with a novel adjuvant may be used as a HepB vaccine in persons aged 18 years and older recommended for vaccination against hepatitis B virus. The vaccine is administered as a 2-dose series (0, 1 month). The recommendations are published online April 19, 2018 in the *Morbidity and Mortality Weekly Report*.

Recommendations for Screening for Lung Cancer

An expert panel report on screening for lung cancer has suggested annual screening with low-dose CT for

asymptomatic smokers and former smokers age 55-77 who have smoked 30 pack years or more and either continue to smoke or have quit within the past 15 years. This and other recommendations are published in the April 2018 issue of the journal *Chest*.

Cannabidiol Gets Unanimous Votes as Adjunctive Treatment for Lennox-Gastaut Syndrome

A US FDA advisory committee has voted unanimously to support approval of a purified formulation of cannabidiol (Epidiolex, GW Pharmaceuticals) as an adjunctive treatment for Lennox-Gastaut syndrome and Dravet syndrome in patients 2 years of age or older.

Piperacillin+Tazobactam Inferior to Meropenem in Bloodstream Infections due to Ceftriaxone-resistant *E. coli*

A new research presented April 22, 2018 at the 28th European Congress of Clinical Microbiology and Infectious Diseases (ECCMID) in Madrid, Spain has shown piperacillin + tazobactam to be inferior to meropenem in potentially fatal bloodstream infections caused by ceftriaxone-resistant *Escherichia coli* and *Klebsiella pneumoniae*.

First Test to Identify *Candida auris*

The US FDA has permitted marketing for a new use of the BRUKER MALDI Biotyper CA system as the first test to identify the emerging pathogen *Candida auris*, which can cause serious infections in hospitalized patients.

Screening as per Limited Criteria of Weight and Age Misses out on 50% of Patients with Diabetes

About half of adults with diabetes and prediabetes would be missed out as a result of targeted screening for diabetes only with age- and weight-based criteria as recommended by the US Preventive Services Task Force (USPSTF), says a published online April 12, 2018 in the *Journal of General Internal Medicine*. Inclusion of other risk factors in screening improves detection of such cases.

Very Resistant Case of Gonorrhea Successfully Treated with Ertapenem

The very resistant case of gonorrhea from the UK has been successfully treated with a 3-day course of intravenous ertapenem. The gonorrhea strain was highly resistant to the dual first-line antibiotics azithromycin and ceftriaxone.

High Risk of Multidrug-resistant Infections with Multi-use Thermometers

The use of multi-patient axial thermometers increases risk of multidrug-resistant hospital infections as per findings of a study presented at the annual meeting of the European Society of Clinical Microbiology and Infectious Diseases in Madrid, Spain. The outbreak of multidrug-resistant *Candida auris* in a hospital neonatal intensive care unit (NICU) was found to be due to the use of multi-use thermometers.

Seventy Million People to be Vaccinated as Part of Vaccination Week in the Americas

More than 70 million people will be vaccinated against a variety of dangerous vaccine-preventable diseases during the 16th Annual Vaccination Week in the Americas - 10 million more than in 2017. Coordinated by the Pan American Health Organization (PAHO), the campaign, which has taken place each year since 2003 and will be celebrated this year from 21 to 28 April, aims to promote the vital role of vaccination in saving lives.

The slogan for this year's campaign is "Strengthen your defense! #GetVax #VaccinesWork." It was chosen in honor of the 2018 Soccer World Cup and seeks to encourage the population in general, and particularly those planning a trip abroad, to get vaccinated in order to strengthen their immune systems and avoid disease.

As part of the Vaccination Week in the Americas celebrations, 11 countries have announced their intention to strengthen measles immunization through the vaccination of 6 million people. The endemic measles virus was eliminated in the Americas but continues to circulate in other parts of the world. However, in 2017, almost 900 new cases were registered in 4 countries of the region, and during the first few months of this year, 380 new cases were registered in 11 countries…(*PAHO/WHO, April 19, 2018*).

Fewer Women Receive High-intensity Statin

According to a study published April 16, 2018 in the *Journal of the American College of Cardiology*, fewer than half of women who filled a statin prescription following a heart attack received a high-intensity statin suggesting that they continue to be less likely than men to be prescribed this lifesaving treatment.

Immune Response of the Patient may Prevent Heart Failure

Patients' own immune response has the potential to prevent the development and progression of heart

failure, according to research presented April 22, 2018 at *Frontiers in CardioVascular Biology (FCVB) 2018*, a European Society of Cardiology Congress in Vienna, Austria.

AAP Releases Clinical Report on DNAR Orders Before Anesthesia and Surgery

The American Academy of Pediatrics (AAP) recommends that hospitals formally address the extent to which Do-Not-Attempt-Resuscitation (DNAR) orders apply in the operating room, according to a new clinical report to be published in the May 2018 *Pediatrics*. Hospitals should re-evaluate of DNAR orders before surgery to help the family decide whether to honor it in the operating room.

Patients on Hemodialysis at Higher Risk of Falls and Altered Mental Status with Opioids

Opioid pain medications may not be as safe for hemodialysis patients and hence their use should be limited when possible, says a study published online April 19, 2018 in the *Clinical Journal of the American Society of Nephrology*. Opioids increase the risk for altered mental status, fall and fracture in a dose-dependent manner in these patients.

24-hour BP Monitoring Better Predicts Mortality than BP Measurement in Clinic

Ambulatory blood pressure (BP) measurement is a stronger predictor of all-cause and cardiovascular mortality than clinic BP measurements, says a study reported online April 19, 2018 in the *New England Journal of Medicine*. Masked hypertension was more strongly associated with all-cause mortality than sustained hypertension or white-coat hypertension.

Urgent ERCP not Superior to Early ERCP in Biliary Pancreatitis without Cholangitis

Urgent endoscopic retrograde cholangiopancreatography (ERCP) done within 24 hours is not superior to early ERCP done between 24 and 72 hours in patients with acute biliary pancreatitis with biliary obstruction without cholangitis. In the study published online February 5, 2018 in *PLoS One*, no clinical difference between the two groups vs. 24-72 hours in terms of ERCP-related complications or total duration of hospitalization.

AAP Recommends Limiting Screen Time for Young Children

The American Academy of Pediatrics (AAP) recommends parents develop healthy media habits for their families i.e., very limited screen time for young children, who learn best from people, not screens. In "Retro Toddler: More Than 100 Old-School Activities to Boost Development", Anne H. Zachry, PhD, OTR/L helps parents understand the importance of engaging with their toddlers (ages 12-36 months) to enhance language, motor and social skills without the distractions of TV, You Tube and noisy electronics.

People with Normal Weight, but Central Obesity at Greater Risk of Heart Disease

Findings of a study presented April 20, 2018 at EuroPrevent 2018, a European Society of Cardiology congress in Ljubljana, Slovenia show that belly fat, even in people who are not otherwise overweight, is bad for the heart. Participants with a normal BMI (18.5-24.9 kg/m^2) and central obesity had an approximately two-fold higher long-term risk of major adverse cardiovascular event (MACE) compared to participants without central obesity.

AAN Guideline Recommends Starting MS Drugs as Early as Possible

The American Academy of Neurology (AAN) has issued a new guideline on the treatment of multiple sclerosis (MS), which says that drugs to treat MS must be started as early as possible on rather than letting the disease run its course. This is because the disease is known to get worse over time. The guideline is published in the April 23, 2018 online issue of *Neurology*.

Postpartum Care should be an Ongoing Process, Says ACOG

A revised Committee Opinion from the American College of Obstetricians and Gynecologists (ACOG) on April 23, 2018 re-emphasizes the importance of the "fourth trimester". ACOG has also recommended that postpartum care should be an ongoing process, rather than a single encounter and that all women have contact with their ob-gyns or other obstetric care providers within the first 3 weeks postpartum.

Suspect Acute Aortic Dissection with Pulse or Neurologic Deficit and Hypotension

A systematic review and meta-analysis published in the April 2018 issue of *Academic Emergency Medicine* suggests that presence of hypotension, pulse or neurologic deficit - findings that have a high specificity and high positive likelihood ratio - should raise the suspicion for acute aortic dissection.

Surgical Resection After Neoadjuvant Therapy Improves Survival in Localized Pancreatic Cancer

In highly selected patients with locally advanced pancreatic cancer, surgical resection after neoadjuvant therapy is feasible and associated with longer overall survival as reported in *Annals of Surgery*, online March 28, 2018.

Study Identifies 17 New Gene Variants Associated with Depression

A genome-wide association study published online April 16, 2018 in *Nature Communications* of three depression phenotypes in UK Biobank has identified 17 independent loci that are significantly associated across the three phenotypes of broad depression, probable major depressive disorder (MDD), and International Classification of Diseases (ICD, version 9 or 10)-coded MDD.

Ticagrelor + Aspirin Increases Saphenous Vein Graft Patency

According to a randomized trial reported online April 24, 2018 in *JAMA*, in patients undergoing elective coronary artery bypass grafting (CABG) with saphenous vein grafting, ticagrelor + aspirin significantly increased graft patency after 1 year vs. aspirin alone.

Increased Physical Activity Both Before and After Treatment Improves Survival in Cancer Patients

Cancer patients who are physically active both before and after treatment are 40% more likely to survive compared to those who are sedentary, according to new findings presented April 18, 2018 at the recent American Association for Cancer Research (AACR) 2018 Annual Meeting in Chicago.

Erenumab Effectively Prevents Episodic Migraine

Results of a study presented April 24, 2018 at the American Academy of Neurology (AAN) 2018 Annual Meeting in Los Angeles, California show the beneficial effect of erenumab in preventing episodic migraine in whom previous treatments have failed. Erenumab inhibits the calcitonin gene-related peptide (CGRP) receptor, which transmits migraine pain signals.

Vein

High serum levels of fibrinogen are associated with greater risk of developing end-stage renal disease (ESRD) in patients with type 2 diabetes mellitus (T2DM) and diabetic nephropathy. These conclusions of a study were published online April 20, 2018 in the journal *Diabetes Research and Clinical Practice*.

Previous Silent MI Associated with Poor Prognosis in Patients Presenting with First Acute MI

A study reported online April 18, 2018 in *JACC Cardiovascular Imaging* found evidence of silent myocardial infarction (MI) in around 9% of 392 patients presenting with their first acute MI with the use of late gadolinium enhancement (LGE) cardiac magnetic resonance (CMR) imaging. It was also associated with poor prognosis.

US FDA Approves Expanded Indication for Trelegy Ellipta in COPD

The US FDA has approved an expanded indication for GlaxoSmithKline's single inhaler triple therapy Trelegy Ellipta (fluticasone furoate/umeclidinium/vilanterol) to include patients with chronic bronchitis and/or emphysema who are on a fixed-dose combination of fluticasone furoate and vilanterol for airflow obstruction and reducing exacerbations in whom additional treatment of airflow obstruction is desired or for patients who are already receiving umeclidinium and a fixed-dose combination of fluticasone furoate and vilanterol.

More Than Half of Patients with Heart Disease Continue Smoking After Hospitalization

Results of the EUROASPIRE V survey presented April 20, 2018 at EuroPrevent 2018, a European Society of Cardiology Congress in Ljubljana, Slovenia show that more than half (55%) of the patients who were smokers before hospitalisation were still smoking 1 year after their heart attack.

Brain Structure Linked to Symptoms of Restless Legs Syndrome

People with restless legs syndrome had a 7.5% decrease in the average thickness of brain tissue in the somatosensory cortex that processes sensory information, according to a study published in the April 25, 2018 online issue of *Neurology*.

Girls with Type 2 Diabetes at High Risk of Menstrual Irregularities

Secondary analysis of data from the Treatment Options for Type 2 Diabetes in Youth (TODAY) study shows that girls diagnosed with type 2 diabetes have a high frequency of menstrual irregularities, according to a new study published April 24, 2018 in the *Journal of Clinical Endocrinology & Metabolism*.

You are Born with a Quota, Use It Judicially

KK AGGARWAL

Everyone is born with a passport with a defined battery life to live up to 100 years after which one has to go back to renew or recharge the batteries.

If the battery is overused or misused and is depleted early, one may have to go back prematurely for recharging, but this time when one comes back, he or she may come back with a different body, which may not be the human one. There are 64 lakhs Yonis as described in the Vedic Literature.

According to the Vedic description if one dies prematurely, there are chances that the rebirth will not be in the same species.

To live up to the time period defined at the time of birth by Dharamaraja one has to follow the principles as described in Yogashastra.

The main principle is the principle of moderation and variety. It says that everything has to be used, if not used will get rusted and if overused will undergo wear and tear.

When using the principles of moderation and variety, it is important to remember that each one of us is born with a fixed quota of everything, a quota of diet, respiration, heart rate and thoughts.

According to swara yoga, one is born with predefined number of respirations to be taken during life. If one consumes them early he will depart for refueling early from the life. To reduce respiratory rate is therefore the basis of postponing aging and prolonging life. Stimulating the parasympathetic nervous system by learning and practicing pranayama, which is slow and deep breathing, does the same.

One breathes 15 times a minute or 21,600 breaths in a day, or 7884000 (78.84 lakhs) a year or 788400000 (78.84 crores) during life (assuming it to be 100 years). Some yoga books say that a person is born with 33 crore breaths, the same if taken at the rate or 15 per minute would last for 42 years. In fact Pranayama originated on the concept that the breaths of each one of us are numbered, that our life-span is dependent on how many times we shall breathe in a given life, and that, as a consequence of this fact, we must reduce the number of breaths so as to live longer.

In Gorakshapaddhati (I.93), it is written that "Due to fear of death even Brahma, the Lord of creation, keeps on practicing pranayama, and so do many yogis and munis. It is recommended that a student of yoga must always control his breath."

Hathayoga-pradipika (II.39) also writes: "All the Gods including Lord Brahma became devoted to the practice of pranayama because they were afraid of death. We the mortals should follow the same path and control the breath."

Similarly one is born with a quota of heartbeats with an average of 70/min. Many studies have shown that people who have a higher resting heart rate have more chances of sudden death. The aim therefore is to keep their heart rate slow. This can be achieved either by regular exercise, meditation, AUM Pranayama, or by meditation. In people who run marathons or participate in other athletic activities, the temporary increase in the heart rate during exercise is compensated by the body by adapting the cardiovascular system in such a way that the basal heart rate reduces. The marathon runners may have a heart rate of only 50/min.

The less one eats the more he lives is an Yogic saying, It is said that people who eat once a day are Yogis, twice a day are Bhogis and thrice a day are Rogis. There are enough studies now, which say that 25% reduction in the calories content can increase the life span. Many studies in rodents have also shown the same effect.

The moderation in exercise is to walk 10,000 steps a day. No exercise will end up with obesity and over use with osteoarthritis.

Stress is the excess of thoughts in the mind. Controlling the mind forms the basis of meditation. Samadhi is the state of no thoughts. Practicing meditation 20 minutes twice-daily helps to restrain the mind with resultant state of Turiya where the mind has controlled limited positive thoughts.

(Disclaimer: The views expressed in this write up are my own).

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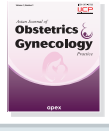
Asian Journal of Obs & Gynae Practice 	4	1,500/- ☐	550/- ☐
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Lighter Side of Medicine

HUMOR

Stock Broker Patient: "Doctor, what should I do if my temperature goes up five more points?"

Intensivist: "Sell!"

Ponder This: The difference between a neurotic and a psychotic is that, while a psychotic thinks that 2 + 2 = 5, a neurotic knows the answer is 4, but it worries him.

As the Intensivist doctor completed an examination of the patient, he said, "I can't find a cause for your complaint. Frankly, I think it's due to drinking."

"In that case," said the patient, "I'll come back when you're sober".

The doctor was off teaching a class, so one of his new students answered the phone in his office. The call was from the school's football coach.

"Doc, it's Ram, he is in extreme pain" said the coach.

He broke his arm in the fourth quarter."

"I see," said the aspiring doctor. "Exactly what part of the arm is that?"

Prisoner: "Look here, doctor! You've already removed my spleen, tonsils, adenoids and one of my kidneys. I only came to see if you could get me out of this place!"

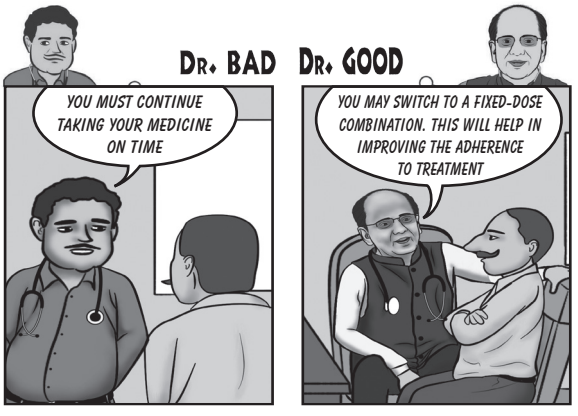
Intensivist: "I am, bit by bit."

From More!

'Your chance of catching an STD during your period is greater, because the blood changes the PhD level in the vagina'.

Dr. Good and Dr. Bad

SITUATION: A type 2 diabetic patient was prescribed multiple antidiabetic drugs for controlling sugar levels.



LESSON: Although no difference has been reported between HbA1c levels of patients who receive loose-dose and fixed-dose combination therapy at equivalent dosage, the latter may help in improving adherence and is believed to be more comfortable for the patients.

J Clin Med Res. 2017;9(8):719-24.

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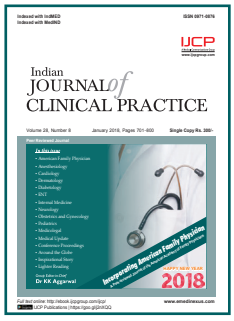

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Books

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

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