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Medtalks with Dr KK Aggarwal

CMAAO Coronavirus Facts and Myth

Can Vaccination be Mandated?

Yes

- Even if one country has a persistent infection, the mutations will occur continuously.
- The available evidence suggests that vaccines are very safe. The public health data suggests that coronavirus disease 2019 (COVID-19) is a considerable health risk, and hence people should be vaccinated to protect themselves.
- It is a novel virus and hence will infect 100% population if the person gets exposed.
- It is the individual choice to choose between corona or vaccine!
- Vaccine mandates may become necessary once we have more vaccines than people willing to take them.
- An employer can mandate vaccine on the job as long as they are not applying it in a discriminatory fashion and making it mandatory for all.
- Vaccine is now available for all healthcare workers as hospitals can mandate it, and patients may ask for treatment only from vaccinated individuals.
- COVID-19 neutralizing antibodies tests are now available and can be a real vaccine passport.

No

- With supplies of the vaccines currently available falling well short of demand, mandating vaccination is not a realistic scenario possibly.
- Queries to be answered: Is it legal for states, private employers and even airlines to mandate a vaccine that has only been approved for emergency use? Who could be held responsible if something goes wrong after getting the shot?
- A vaccine mandate that requires that every man, woman and child in America get a particular vaccine would be relatively unprecedented. Usually, when vaccine mandate is considered, it may be restricted to if you wish to send your child to school; or if you want to work for a specific type of employer, like a hospital.
- The limited case law existing in the USA, which mainly goes back to this one case from 1905, Jacobson v. Massachusetts, does say that states and municipalities have vast powers to compel vaccination for the benefit of public health.
- When it comes to these vaccines, they have not yet received full authorization. Is it legal to require something that has not been fully authorized?
- But will it stand up to a challenge of somebody saying: "Hey, if you want to compel me to take something, you have to make sure that it is safe and effective through the proper channels." That is going to be an interesting question that will play out in the next year or so.

HCFI Round Table Expert Zoom Meeting on "Adverse Events Including Deaths Following Vaccinations"

6th February, 2021 (11 am-12 pm)

Participants: Dr KK Aggarwal, Dr Ashok Gupta, Dr Suneela Garg, Prof Mahesh Verma, Dr Anita Chakravarti, Dr DR Rai, Mr Bejon Misra, Ms Balbir Verma, Dr KK Kalra, Dr Anil Kumar, Dr Suresh Mittal, Dr S Sharma

Consensus Statement of HCFI Expert Round Table

- Vaccines are universally tested and monitored and are among the safest medical products in use. Although evidence supports the safety of vaccines, there are rare instances where the causal relationship between vaccines and complications, including deaths has been established or plausible theoretical risks exist.
- Vaccines have saved millions of lives. Like any other drug, some adverse events (common, severe, serious) are associated with vaccinations. One should be aware about them and it is also important to know how to tackle them.
- Convert any contraindication to an indication. This will remove vaccine hesitancy. Try to identify vaccine intolerant patients and see how to proceed to give them the vaccine.
- Two patients in Brazil have tested positive for more than one strain of coronavirus. This is a matter of concern.

- India has overall only 25% seropositivity.
- Mutations are causing more mortality. The UK Prime Minister has said that the new UK variant may be more deadly.
- In India, out of 28 lakh vaccinations, 13-16 deaths (between 25 and 56 years of age) have occurred (Uttar Pradesh, Karnataka, Andhra Pradesh, Rajasthan, Telangana, Haryana, Odisha, Kerala and Gujarat); the vaccine taken in each case was Covishield. All had cardiovascular problems or brain stroke.
- In Norway, 33 elderly (≥75 years) and frail individuals died in a short time after receiving the first dose of the vaccine.
- Evidence from South Korea shows that people can die after flu vaccine; 23 persons, out of 13 million people who received the flu vaccine, died after being vaccinated.
- Ten people died in Germany, 79-93 years of age.
- A person can develop anxiety, vasovagal attack after seeing the vaccine injection.
- When a vaccine is taken, the antigen-presenting cells (APCs) will present the vaccine antigen to CD8+ T cells (cytotoxic) and CD4+ T cells. Th1 cytokines stimulate CD8+ T cells and in turn acquire the ability to attack the infected cells. Th2 response helps in the differentiation of B cells. The activated B cells can produce neutralizing antibodies. However, imbalanced immune responses can cause pulmonary immunopathology, partially due to aberrant Th2 response or antibody-dependent enhancement (ADE).
- Different reactions are seen after a vaccine: Allergy to vaccine or any of its ingredients, reactogenicity, reacto-immunogenicity (exaggerated Th1 and Th2 response), antigenicity or immunogenicity, reaction to pre-existing antibodies, development of disease enhancing antibodies/non-neutralizing antibodies.
- Before giving the vaccine, ask:
  - Will you develop and tolerate vasovagal reaction? If there is a history of syncope, the vaccine should be given in the lying down position and stay hydrated.
  - Are you prone to develop and tolerate immediate (IgE) and/or delayed (non-IgE) allergy? Allergy occurring in the first hour is IgE-mediated; if it is occurring after 1 hour and specifically after 6 hours, it is non-IgE-mediated allergy. In India, delayed reaction is being seen.
  - If likely (non-IgE-mediated): pre-load with montelukast + H1 + H2 blocker. If known IgE allergy: Get absolute eosinophilic count and IgE levels, do a scratch test/intradermal challenge.
  - Will you get exacerbation of thrombo-inflammation? If baseline C-reactive protein (CRP) >1 mg/L, it will cause rise in CRP, interleukin (IL)-6, IL-1β. In such cases, preload the patient with ACS (aspirin, colchicine and statin). CRP may rise by 30% on Day 2. If rise is more or CRP is >10 mg/L, then add mefenamic acid or any other immunomodulator.
  - Will you get oversympathetic response? (abnormal HR variability, 6 MWD/T less than 700 feet or over sympathetic response to walking): Pre-load such patients with a β-blocker.
- For non-IgE-mediated reactions, the following protocol comprising of H1 and H2 antihistamines and sometimes montelukast, aspirin or glucocorticoids will help.
  - Cetirizine (10 mg orally) is given 30-120 minutes before the start of the procedure.
  - Famotidine (20 mg IV or orally) is given 30-60 minutes before the start of the procedure.
  - Aspirin (325 mg orally) is given to patients with flushing during their initial reaction. This is administered the night before the procedure and again 1 hour before the start of the procedure.
  - Montelukast (10 mg orally) is given the night before the procedure and again 1 hour before the start of the procedure.
  - When desensitizing to chemotherapy or biologic agents, any premedications (such as steroids) that would be given to a nonallergic patient should be incorporated into the planned premedications as well.
- Reduce the precipitating factors for coronary artery disease (CAD) - hypertension, fever, tachyarrhythmias, thyrotoxicosis, anemia, polycythemia, hypoxemia and valvular heart disease.
- Ask for a history of cocaine use in young people; even casual use of cocaine may be associated with acute or chronic cardiovascular toxicity. Cocaine can precipitate myocardial infarction.
- Smoking will increase the sympathetic response; it will increase BP by 20 mmHg. A person, who smokes before taking the vaccine and has an

underlying heart disease, both can precipitate acute cardiovascular event.

- The amount of alcohol taken the previous night can also precipitate oversympathetic response.
- Frail individuals with comorbid conditions will not be able to tolerate even mild sympathetic overactivity. They need to be premedicated.
- The response to vaccine is the same as with COVID natural infection.
- The AEFI (adverse event following immunization) definition does not mention the time.
- Every death within 3 months of vaccine should be investigated.
- The long-term effects of the vaccine are unknown.
- We need to prevent post-vaccine complications. They are manageable and preventable.

Round Table – Expert Group on Environment Zoom Meeting on "Issues and Challenges in Implementation of Biomedical Waste Management Rules"

7th February, 2020 (1-2 pm)

Participants: Dr KK Aggarwal, Dr Anil Kumar, Dr Dipankar Saha, Dr M Dwarkanath, Mr Pankaj Kapil, Mr Pradeep Khandelwal, Mr Neeraj Tyagi, Dr Shyam Gupta, Dr Suresh Mittal, Dr Meenakshi Soni, Ms Ira Gupta, Dr S Sharma

The meeting was chaired by Dr M Dwarkanath and co-chaired by Mr Pradeep Khandelwal.

Key points from the discussion

- COVID-19 has increased the volume of biomedical waste (BMW) generated. With patients in home care, this subject has become very important and needs attention because hazardous waste is being disposed of mixed with domestic waste.
- Expired medicines, broken mercury thermometers, used batteries, used needles and syringes, contaminated gauze, etc., generated in home care of patients are covered under Solid Waste Management Rules, 2016 as "domestic hazardous waste" and not under BMW management.
- The Central Pollution Control Board (CPCB) should come out with SOPs about domestic hazardous waste. Awareness should be there so that it is properly handled and disposed.
- There are three types of waste in household: Wet waste, dry waste and domestic hazardous waste.
- NDMC and SDMC have started collecting the domestic hazardous waste. EDMC has started work on this. Indore has done a lot of work on this.
- Domestic hazardous waste includes paints and varnishes, expired medicines, sanitary pads, batteries. These are collected separately and segregated at materials recovery facilities (MRF).
- Indore model can be adopted and a separate system for domestic hazardous waste collection can be established.
- Big chemist stores or stockists should keep a box where the expired and left over medicines can be put under the extended producers responsibility (EPR) by a pharmaceutical company. They can be then collected and transported for safe disposal.
- Special e-waste collection bins had been put to collect electronic waste. Along similar lines, Delhi Pollution Control Committee (DPCC) can tie-up with market trader/drug stockist associations and put collection bins at various places for domestic hazardous waste, at least for expired medicines.
- For synchronization of segregation and collection system, it is important to have education and awareness for all. Education should start at the school level itself; there should be regular programs and courses round the year.
- People should know where the waste should be disposed.
- The Residents Welfare Association (RWA) should be asked to keep collection bins for domestic hazardous waste, especially with many patients in home care/quarantine.
- Implementation is poor because chain is incomplete. All things should move parallel to each other to achieve sustainability.
- Even if segregation is done, people do not know where it should go. Domestic hazardous waste has to go to Hazardous Waste Treatment, Storage and Disposal Facilities (TSDFs). Delhi does not have a TSDF.
- A suggestion was given to write to CPCB/Central government/Delhi government to undertake a survey for lifecycle analysis of e-vehicle batteries.
- There is a lack of space for landfills; hence, lot of waste is dumped in the open. Awareness needs to be generated about domestic hazardous waste and not just limited to penalization.
- Monitoring of autoclaving and steam disinfection should be done.

- A BMW nodal officer should be appointed in each hospital. However, most hospitals (≥50 beds) already have a BMW management committee including a nodal officer (at doctor level); there are advisory committees at district level and multi-departmental teams are there for inspection.
- COVID waste needs to be segregated (in double bags) with proper labeling, treated and disposed of expeditiously, within 24 hours, as per latest revision of CPCB guidelines (31st July, 2020).
- The generation of BMW must be reduced. This should be our first emphasis. For example, to reduce discarded medicine waste, medicines should be dispensed in the quantity that has been prescribed by the doctor.
- EPR should be implemented; chemists must be regulated to take back discarded medicines.
- Write to Insurance Regulatory and Development Authority (IRDA) that when reimbursing for home care, there should be a written assurance that they have followed BMW and other waste management guidelines. Doctors should also prescribe these guidelines – how to handle the home generated BMW. Adherence to these guidelines should be mandated.
- DPCC/CPCB should write to the National Medical Commission in this regard.
- Can masks be washed, disinfected and reused? A procedure should be prescribed and can be standardized and should be included in CPCB guidelines. Fabric masks can be washed with detergent and re-used. N95 masks are single use masks. The masks can be discarded in domestic waste after 72 hours of keeping in a paper bag.
- For collection boxes (for discarded medicines, etc.), along with EPR, all hospitals, medical associations, nursing homes, schools and colleges should be included.
- Wherever first aid is provided, there should be a collection facility either in the form of a box or room.
- Time for collection should be fixed; there should be helpline numbers.
- MCD vehicles that collect waste should be compartmentalized to avoid mixing of different kinds of waste. The compartments should be of appropriate volume and size.

Second Dose Reactogenic – Are COVID Vaccines Too Risky for Some People?

- The second dose of the vaccine appears to be more reactogenic than the first dose. Most symptoms occur within the first 3 days of receiving the dose and often resolve within a couple of days. The most common side effects appear to be pain, fatigue, headache and myalgias.
- It appears to be associated with the antibody response. With the first dose, most people don't have much of a reaction. There might just be a little bit of soreness at the injection site. Most people develop more side effects after the second dose. Probably after the first dose, the body starts developing an antibody response or an immune response. When the second dose is given, the body is ready to act against the antigen provided by the vaccine. This leads to an inflammatory response from the body.
- The side effects like pain or fatigue are not allergies. They're normal side effects of the vaccine.
- Most allergic reactions will occur within 30 minutes of vaccine administration. They present with urticaria or hives, angioedema and wheezing. One or two of these symptoms along with a low blood pressure or fast heart rate is anaphylaxis.
- New data shows that anaphylaxis appears to be not as common as previously thought.
- The frequency of anaphylaxis is around 5 cases per million doses of the Pfizer vaccine and nearly 2.8 cases per million doses of the Moderna vaccine.
- People have allergies to several allergens. Food products, pet dander, venom to bees or even latex, none are contraindicated. Even if one has anaphylaxis to these products, he can safely get the mRNA vaccines.
- The only major contraindication to the mRNA vaccines is if one has had an immediate allergic reaction to the first dose of the vaccine or if one has had such a response to a component of the vaccine previously. This includes polyethylene glycol. This is a component of both the vaccines and some people may react to it.
- Another contraindication is if one has had anaphylaxis to polysorbate. Polysorbate can cross-react with polyethylene glycol.

(Source: *Medpage Today*)

Variant Strain in UK More Severe

- The UK variant of coronavirus is probably more fatal and leads to more hospitalizations compared to nonvariant coronavirus cases, suggest data published on a British government website. The report stated that there was increased severity of COVID-19 cases caused by the B.1.1.7 variant compared to nonvariants of concern. The B.1.1.7 cases have been reported to be 30-70% deadlier than the actual wild-type strain.
- The concerns were first raised in January, when the initial data suggested that cases with B.1.1.7 were deadlier than nonvariant cases.
- The London School of Hygiene & Tropical Medicine noted a relative hazard of death within 28 days of 1.58 for variant cases compared to nonvariant cases. The Imperial College London stated that the mean ratio of case fatality for variant cases was 1.36.
- Public Health England conducted a matched cohort analysis to note a death risk ratio of 1.65 for variant versus nonvariant infected people.
- Public Health Scotland employed the S-gene target failure as a proxy to ascertain variant cases. The risk of hospitalization was found to be higher among S-gene target failure cases versus S-gene positive cases.
- Intensive Care National Audit and Research Centre (ICNARC) and QRESEARCH also noted that there was a greater risk of ICU admission for variant cases.
- Evidence thus suggests that B.1.1.7 is tied to an increased risk of hospitalization and mortality compared to infection with nonvariant virus.
- CDC modeling in January estimated that the UK variant would dominate in the US by the end of March. A new modeling study indicates that the incidence of variant cases is increasing two-fold every 10 days in this country.

(Source: *Medpage Today*)

With input from Dr Monica Vasudev

UK Strain: Longer Duration of Infection

- It was believed that B.1.1.7 variant's increased infectiousness is due to higher viral load. New data suggest that it is related to delayed clearance, and longer duration of infection.
- Infection duration appears to be longer for B.1.1.7, with a mean of 13.3 days (90% confidence interval [CI] 10.1, 16.5), compared to 8.2 days for non-B.1.1.7.
- A study evaluated if acute infection with B.1.1.7 is associated with higher or more sustained nasopharyngeal viral concentrations. Longitudinal polymerase chain reaction (PCR) tests conducted in a cohort of 65 individuals with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) undergoing daily surveillance testing were evaluated. These included seven infected with B.1.1.7.
- For patients with B.1.1.7 variant, the mean duration of proliferation phase, clearance phase and overall duration of infection was 5.3 days, 8.0 days and 13.3 days, respectively. The corresponding figures for non-B.1.1.7 virus were mean proliferation phase of 2.0 days, a mean clearance phase of 6.2 days, and a mean duration of infection of 8.2 days.
- The peak viral concentration for B.1.1.7 was 19.0 Ct vs. 20.2 Ct [19.0, 21.4] for non-B.1.1.7. This represents 8.5 $\log_{10}$ RNA copies/mL [7.6, 9.4] for B.1.1.7 and 8.2 $\log_{10}$ RNA copies/mL [7.8, 8.5] for non-B.1.1.7.
- The variant B.1.1.7 thus appears to result in longer infections with similar peak viral concentration compared to non-B.1.1.7.
- The longer duration may result in increased transmissibility of the variant.

Comments

- These variants probably carry non-spike mutations that affect their sensitivities to type I (or III) interferon.
- Not related to higher viral load as higher load is consistent with worse outcomes. Mitigation efforts should be just as effective.

(Source: https://dash.harvard.edu/bitstream/handle/1/37366884/B117Trajectories_10Feb2021.pdf?sequence=1&isAllowed=y)

With input from Dr Monica Vasudev

One in Five Diabetics Hospitalized with COVID Die in 28 Days

- While about half of the patients with diabetes hospitalized with COVID-19 will be discharged from hospital within a month, one-fifth of the patients will have died, reports the French CORONADO study.
- Early findings published in May last year revealed that 10.6% of patients with type 2 diabetes and COVID-19 and 5.6% of those with type 1 diabetes and COVID-19 succumbed within 7 days of hospitalization.

- Two thousand seven hundred ninety-six patients with diabetes were hospitalized with COVID-19 at 68 institutions in France from March 10 to April 10, 2020, and were followed for 28 days.
- Approximately 44.2% of patients had microvascular complications and 38.6% had macrovascular complications.
- After 28 days, 20.6% patients were reported to have died and 50.2% were discharged. The median duration of stay in the hospital was 9 days.
- Increasing age was the most important risk factor that augured poorly, followed by a history of microvascular complications, dyspnea on admission and inflammatory markers (white blood cell count, elevated CRP and increased aspartate transaminase).
- Routine treatment with metformin and a history of COVID-19 symptoms before hospitalization were among the positive risk factors.
- Blood glucose level was a neutral prognostic factor. Another one in this category was treatment with dipeptidyl peptidase-4 (DPP-4) inhibitors. Statin therapy was a negative prognostic factor.
- The data are published in *Diabetologia*.

(*Source: Medscape*)

Single High Dose of Vitamin D3 not Tied to Reduced Hospital Stay in Moderate-to-severe COVID-19

A study published in the *Journal of the American Medical Association* has revealed that among patients hospitalized with moderate-to-severe COVID-19, a single high dose of vitamin D3 did not significantly reduce hospital stay in comparison with placebo. The trial was conducted in 2 sites in Sao Paulo with 240 hospitalized patients with COVID-19 who had moderate-to-severe infection at the time of recruitment from June 2 to August 27, 2020. Patients were randomized to receive a single oral dose of 2,00,000 IU of vitamin D3 or placebo (n = 120 in each group).

(*Source: DG Alerts*)

Life Expectancy in the United States Declined by a Year in the First 6 Months of 2020

Life expectancy in the US reportedly came down by a year in the first-half of 2020. This represents the largest drop since World War II. This provides the complete picture of the pandemic's impact on expected life spans of Americans. They declined to 77.8 years from 78.8 years in the year 2019.

Life expectancy of Blacks came down by 2.7 years in the first-half of last year, after rise noted for 20 years. The gap between Black and White Americans, which was seen to be constricting, now stands at 6 years, which is the widest since 1998.

Contrary to the decline caused by the complex issue of drug overdoses, this one, guided mainly by COVID-19, will perhaps not last as long since deaths due to the virus are declining and people are getting inoculated. In 1918, when thousands of Americans died in the flu pandemic, life expectancy fell 11.8 years compared to the previous year, down to 39. The numbers completely bounced back the next year.

(*Source: NY Times*)

Minutes of Virtual Meeting of CMAAO NMAs on Corona Update: Country Experiences

20th February (Saturday, 9.30 am-10.30 am)

Participants: Member NMAs: Dr KK Aggarwal, President-CMAAO; Dr Yeh Woei Chong, Singapore Chair-CMAAO; Dr Alvin Yee-Shing Chan, Hong Kong, Treasurer-CMAAO; Dr Ravi Naidu, Malaysia; Dr Marthanda Pillai, India, Member-World Medical Council; Dr Angelique Coetzee, President-South African Medical Association; Dr Marie Uzawa Urabe, Japan Medical Association; Dr Md Jamaluddin Chowdhury, Bangladesh Medical Association; Dr Qaiser Sajjad, Secretary General-Pakistan Medical Association; Dr Debora Cavalcanti, Brazil; Dr Prakash Budhathoky, Treasurer-Nepal Medical Association

Invitees: Dr Akhtar Husain; Dr S Sharma, Editor-IJCP Group

Key points from the discussion

Malaysia Update: Malaysia has gone through the third wave of coronavirus infection. The total lockdown called the "movement control order" has been reduced in some states as the total number of cases is now declining. The vaccine (Pfizer) roll-out will begin from 26th February. One million doses will be received today. The frontline workers will receive the vaccine first. Malaysia expects to vaccinate 80% of population by April 2022. The total lockdown has made a difference to the number of cases.

Brazil Update: The cases are increasing, hospitals are full and there are no beds for new cases. People do not use masks. Vaccination has started with Oxford/AstraZeneca vaccine and the CoronaVac vaccine.

South Africa Update: Vaccination has started in all provinces 2 days back. Total daily cases are around

2,000 cases/day. Cases are now reducing because of lockdown measures. Some restrictions have been relaxed; schools have been reopened this week.

Hong Kong Update: The lockdown in Hong Kong has limited public gatherings to less than 4; lunch time just two people and only yesterday dining at restaurants has resumed. Gyms, cinemas, gaming arcades, beauty parlors, sports centers have now reopened. Vaccination has been launched with Sinovac vaccine. The Pfizer-BioNTech vaccine will arrive at the end of February and is expected to be administered in March. Many people are apprehensive about the Pfizer vaccine because of reports of deaths in Norway and Bell's palsy in Israel.

Japan Update: Japan has started to vaccinate the medical staff. The numbers are under control. Although a mild lockdown is still in place to control infection during the vaccination process.

Nepal Update: Numbers are reducing, serious disease is also reducing. There is; however, a risk of rise in cases because of political gatherings, processions, etc. Vaccination has started 3 weeks before for frontline workers. After 2 weeks, mass vaccination will start for persons above 60 years.

Singapore Update: There are around 0-1 case/day. People are not allowed to visit each other except 8 family members a day are allowed to visit two households. About 2,50,000 people have been vaccinated till date and around 1,10,000 having received their second dose; one person aged 72 years developed myocardial infarction (MI) after the first dose of vaccine (Pfizer). However, according to the initial assessment, this was not caused by the vaccine. The Moderna vaccine has also arrived in the country. Singapore aims to vaccinate the whole population by August this year.

Bangladesh Update: The infection rate is coming down to around 400 new cases/day, detection rate is <3%. There are political gatherings although there has been no increase in infection rates. More than 1% has been vaccinated; initially there was fear about the vaccine, but the situation has improved. Now there is a very good response.

Pakistan Update: The number of cases and deaths are decreasing. No serious cases; hospitalized cases have also reduced. However, people do not follow SOPs. The vaccination process (Sinopharm vaccine) has started for healthcare workers; although there is hesitancy among them. The Oxford-AstraZeneca vaccine is awaited.

India Update: The situation is optimistic with numbers reducing. Three states are contributing around 60% of cases. Sero-surveillance has shown that 21% people have developed antibodies. The healthcare workers have been accepting of the vaccine. There is a debate whether to delay the second dose by 8-12 weeks. Side effects have been very minor. Deaths that have occurred after vaccination are not directly related to the vaccine.

- Every country is worried about resurgence in cases.
- Factors such as mutations, COVID inappropriate behavior and super-spreader event, acting in combination, will lead to surge in cases.
- Two types of mutation: Substitution and deletion.
- Deletion mutation is permanent, while substitution mutation can be autocorrected by proof reading unless associated with deletion.
- Mutation in the state of Maharashtra in India is a substitution type of mutation and therefore is localized to that region. The UK strain has three deletions. Hence, it is of concern. South Africa and Brazil strains do not have deletions and therefore are not spreading globally.
- Newer mutations mean longer period of isolation.
- It has been suggested that humidity from masks may lessen severity of COVID-19. Face masks substantially increase the humidity in the air that the mask-wearer breathes in. This higher level of humidity in inhaled air may be why wearing masks has been linked to lower disease severity as hydration of the respiratory tract is known to benefit the immune system.
- It is important to shift from single gene testing to minimum three gene testing to be able to detect mutations.
- Reactivation of the disease has been reported in an immunocompromised patient 4 months after initial infection, documented by genomic sequencing.
- Allergic manifestations are same in all types of vaccines; reactogenicity is least in killed virus vaccine and maximum in RNA vaccines, while immunogenicity is lowest in killed vaccine and same in other vaccines. Killed vaccines are safer but less effective, so require more doses.
- In India, 744 doctors have died due to COVID, Pakistan 191, Bangladesh 130, South Africa 300, Nepal 6 and Brazil 440.
- Multiple doses of vaccine may precipitate multisystemic inflammatory disease.
- Swift and prompt policy is needed to determine the timing of the second dose.