HCFI Dr KK Aggarwal Research Fund

Minutes of an International Weekly Meeting held by HCFI Dr KK Aggarwal Research Fund

Topic: A Pandemic Snapshot

Speaker: Dr Monica Vasudev, *Allergist & Clinical Immunologist, Fellow of American Academy of Asthma, Allergy and Immunology, Advocate Aurora Health, Wisconsin, USA*

10th September, 2022 (Saturday, 9.30-10.30 am)

- There has been a significant drop in the life expectancy in the United States. The Centers for Disease Control and Prevention (CDC) has published data regarding this. Life expectancy at birth in the year 2021 is now 76.1 years. There has been an overall 2.7 years loss in total life in the last 2 years; for females, the life expectancy has declined by 2.3 years and for males by 3.1 years.
- The BA.5 Omicron sublineage accounts for 87.5% of total samples collected since the last 3 weeks. BA.4 has declined to just 2.2% of the total samples.
- There has been a reduction in vaccine efficacy in this period of BA.4/5. The variants are escaping the immune protection of the vaccine. This raises the need for a pan vaccine or novel vaccine.
- Many intranasal vaccines are under clinical trial including BBV154 from Bharat Biotech developed in collaboration with Washington University. Intranasal vaccines can be an alternative vaccine for those who are reluctant to take the injectable doses.
- The world's first inhaled coronavirus disease 2019 (COVID-19) vaccine developed by the Chinese company CanSino Biologics has been approved for use as a booster dose in China. It is an adenovirus-vectored COVID-19 vaccine similar to the injectable vaccine.
- The first nasal COVID-19 vaccine has been approved (emergency use authorization or [EUA]) in India. It has been developed by Bharat Biotech in collaboration with Washington University. This vaccine can be refrigerated. In this vaccine, the spike protein inserted adenovirus, which is unable to cause illness. The new vaccine also incorporates two mutations into the spike protein that stabilize it in a specific shape that is most conducive to forming antibodies against it.
- When the virus enters the body, the dendritic cells grab the pieces of virus. They recruit helper T cells, which match with the viral pieces. This is followed by the B cells that also match with the virus. The activated B cells form plasma cells that produce antibodies, which attach to the virus and fight off the infection. Some B cells become memory cells which remain in the body and are reactivated in case of reinfection with the same virus.
- The older antibodies are not a good match for the newer variants. The antibodies to the original virus may still be able to attach to some parts of a newer variant, which have not changed.
- The US Food and Drug Administration (FDA) has approved the updated Moderna and Pfizer-BioNTech bivalent COVID-19 vaccine for use as a booster dose.
- Bivalent vaccines have the same total antigen amount as the monovalent vaccines. Moderna's monovalent COVID-19 vaccine contains 50 μg of spike protein from the ancestral (original) severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) strain. The bivalent Moderna vaccine contains 25 μg of spike protein from the ancestral SARS-CoV-2 strain and 50 μg of spike protein from the Omicron (BA.4/BA.5) SARS-CoV-2 strain.
- Similarly, the Pfizer-BioNTech vaccine contains 30 μg of spike protein from the ancestral (original) SARS-CoV-2 strain. The updated booster vaccine contains 15 μg of spike protein from the ancestral SARS-CoV-2 strain and 15 μg of spike protein from the Omicron (BA.4/BA.5) SARS-CoV-2 strain.
- The US is planning to shift to annual COVID-19 booster doses similar to flu shots, though the elderly may require more frequent vaccination.
- For long COVID, the CDC requires an interval of more than 4 weeks after acute COVID-19. One in five COVID-19 survivors aged 18 to 64 years and one in four survivors 65 years and older experienced at least one incident condition that might be attributable to previous COVID-19.
- The incidence of post-acute sequelae of SARS-CoV-2 infection (PASC) is approximately 14% in adults and 21% in children and adolescents.

- A report from the US has documented the prevalence of SARS-CoV-2 infection and long COVID in US adults during the BA.5 surge in June-July 2022; 21.5% had symptoms more than 4 weeks. Nineteen percent were boosted, 25% were vaccinated but not boosted, while 22% were unvaccinated.
- The prevalence of long COVID in children varies from 1:4 to 1:100. About 25% continue to have symptoms months after hospitalization for COVID-19. The diagnosis is a challenge because of the heterogeneous symptoms. Symptoms persistent at 12 weeks are required to meet the definition of long COVID.
- An international consensus for a pediatric long COVID definition is anticipated in 2023; this will be an important step in the illness being recognized and managed consistently.
- At the population health level, there is a suggestion that the incidence of type 1 diabetes is increased in children with long COVID, although the cause of this is unclear and requires further investigation.
- New research has found the spike protein of the SARS-CoV-2 virus in the blood of long COVID patients up to a year after infection but not in people who have fully recovered from COVID. The virus has also been found in tissues including the brain, lungs and lining of the gut.
- The findings suggest that leftover reservoirs of the virus could be provoking the immune system in some people, causing complications such as blood clots and inflammation, which may fuel specific long COVID symptoms.
- Acute COVID-19 correlates with biomarkers of systemic inflammation, hypercoagulability and comorbidities that are less prominent in PASC.
- Macrovessel thrombosis, a hallmark of acute COVID-19, is less frequent in PASC.
- Female sex at birth is associated with reduced risk for acute COVID-19 progression but increased risk of PASC.
- Persistent microvascular endotheliopathy associated with cryptic SARS-CoV-2 tissue reservoirs has been implicated in PASC pathology.
- Autoantibodies, localized inflammation and reactivation of latent pathogens may also be involved, potentially leading to microvascular thrombosis, as documented in multiple PASC tissues.
- The US government has outlined a plan to get Americans the best available protection through free and easy access to new, updated COVID-19 vaccines and ensuring easy access to COVID testing and treatment to mitigate the spread of COVID-19. The plan also calls on all Americans to use every tool at their disposal to keep communities safe and schools and businesses open and to prepare for potential surges and new variants and building a resilient national COVID-19 response moving forward.

(Excerpts from presentation by Dr Monica Vasudev)

Participants – Member National Medical Associations: Dr Yeh Woei Chong, Singapore, Chair of Council-CMAAO; Dr Alvin Yee-Shing Chan, Hong Kong, Treasurer-CMAAO; Dr Marthanda Pillai, India Member World Medical Council, Advisor-CMAAO; Dr Mvuyisi Mzukwa, South Africa; Dr Angelique Coetzee, South Africa; Dr Akhtar Hussain, South Africa; Dr Md Jamaluddin Chowdhury, Bangladesh; Dr Marie Uzawa Urabe, Japan; Dr Salma Kundi, Pakistan; Dr Mulazim Hussain Bukhari, Pakistan

Invitees: Dr Russell D'Souza, Australia UNESCO Chair in Bioethics; Dr Monica Vasudev, USA; Dr Nicholas Veliotes; Dr Pinki Chauhan; Dr Colin Goldberg; Dr EC Ng; Dr Roy Teow; Dr Rashid Mahmood; Dr Anita Jain; Dr S Sharma, Editor-IJCP Group

Moderator: Mr Saurabh Aggarwal

HCFI Round Table Environment Expert Zoom Meeting on "Battery Waste Management Rules 2022 – Part 2"

Speaker: Mr Sanjiv Kumar, *Re Sustainability Limited*

11th September, 2022 (Sunday, 12 noon - 1 pm)

- The 2001 battery rules were mainly focused on lead acid batteries. The new rules cover all types of batteries – electric vehicle batteries, portable batteries, automative batteries and industrial batteries.
- The draft rules were shared in 2020 and they came into effect from 27th August, 2022. They replace the 2001 Batteries (Management and Handling) Rules.
- These new rules have come after a gap of two decades.
- These rules function on the concept of extended producer responsibility (EPR). The responsibility of collection and recycling/refurbishment of waste batteries and use of recovered materials from wastes into new batteries lies with producers, importers and brand owners (PIBO).

- The objective is that every part of the battery is recovered, reused and recycled. Only the reject should go for disposal to secured landfill and not to Municipal Solid Waste (MSW) dumping grounds.
- The aim is to also ensure alignment with other rules that are coming up so that the system of Atmanirbhar Bharat is also in place by setting up new industries and entrepreneurship for collection, transportation and refurbishment of waste batteries by way of new technologies and investment.
- The rules also enable setting up a mechanism and centralized online portal for exchange of EPR certificates between producers and recyclers or refurbishers to fulfill the obligations of producers.
- The rules facilitate online registration and reporting, auditing and formation of a committee to monitor the implementation of the rules.
- The rules also work on the principle of Polluter pays Principle. Environmental compensation (EC) will be imposed for nonfulfillment of EPR targets, responsibilities and obligations set out in the rules.
- The funds collected under EC are to be utilized in collection and refurbishing or recycling of uncollected and non-recycled waste batteries. However, how it is to be used is not so clearly defined.
- The 2001 rules were more to create awareness, while the new rules are about creating a robust mechanism or steps as to how to execute the same.
- The 2022 rules apply to produce, dealer, consumer and entities involved in collection, segregation, transportation, refurbishment and recycling of waste battery. They cover all types of batteries regardless of shape, chemistry, volume, weight, composition and use. However, batteries used in equipment connected with the protection of the essential security interests and those specifically meant for military purposes or equipment designed to be sent into space are exempt from the new rules.
- The new rules have laid down responsibilities and functions of different stakeholders such as the producer, consumer, public waste management authorities, refurbisher, recycler, Central Pollution Control Board (CPCP) and State Pollution Control Board (SPCB). The 2001 Rules had defined the functions of the manufacturer, importer, assembler and reconditioner.
- It is the responsibility of the producer to ensure the attainment of the batteries they introduce in the market for their recycling or refurbishment obligations.
- The producer shall be completely accountable to meet their EPR. Year-wise targets have been defined for EPR for all types of batteries, if they are achievable.
- The producer has to register through an online centralized portal as the producer. He has to provide an EPR plan to the CPCB every year for the battery manufactured in the preceding financial year.
- Different schemes may be considered such as buy back or deposit for collection of the waste battery. It is left to the producer or dealer to decide which to use.
- To prevent somebody from absconding with the deposit money, a document can be issued at the time of purchase of a battery that can be encashed in any post office to get back the deposit.
- They also have to submit an annual return with regard to the waste battery collected or refurbished.
- Consumers have the responsibility to discard battery waste separately from other wastes such as mixed waste, domestic waste. They should handover the battery waste to entities engaged in their collection/refurbishment or recycling.
- It is the duty of the entities involved in collection, segregation and treatment to hand over the waste battery to the recycler or refurbisher registered with the SPCB.
- The recycler or refurbisher have the responsibility to ensure that the hazardous waste generated during the process of refurbishment (dismantling of batteries and recovery of metals) is strictly managed according to the Hazardous Waste Management Rules, 2016 and other wastes as per the Solid Waste Management (SWM) 2016 and Plastic Waste Management Rules (PWM) 2016 as the process can be harmful to the health of the workers.
- The 2022 rules talk of public waste management authority. However, they do not generally engage in private waste collections. The rules also say that the PIBOs can engage any entity. The rules are not very clear on how the PWMA and PIBOs will be engaged.
- There is also a need for waste audit; the rules are not very clear on this important issue.
- The manufacturers are expected to establish collection centers for collection of used batteries from dealers and consumers. They have to ensure the batteries collected are transported safely to the registered recyclers. They have to annually report sales and buybacks to the CPCB and SPCB.

- These rules pose many potential problems and challenges, which need to be debated such as the incentive to follow the rules is not explicitly mentioned. The rules fail to establish any regulatory standards for testing and classifying used batteries that have a secondary life and could still be used in other applications such as in households or energy backups.
- Energy conservation through storage batteries will have huge manufacturing potential and increase employment.
- There is not provision for a separate license for handling on lead acid batteries, separate from e-waste and there is no reduced minimum requirement for entry into the recycling of the lead acid batteries.
- Lot of research is required for lead acid batteries
- For effective implementation of the new battery waste management rules, there have to be demand measures, policy support, incentivizing and financing.
- An inventory of how much is being produced is needed as in the coming years, battery waste is going to increase because of the use of electric vehicles and electronic devices. We have not been able to determine the per capita e-waste and electric waste.
- Integration of the various waste management rules is required.
- Putting the rules in place without having any benefit for the manufacturer or recycler leads to noncompliance.
- Strengthening of SPCB is very important.
- All waste management rules need to be critically assessed if their objectives have been achieved and identify gaps, if any. The new rules should be reviewed to see that they do not suffer from these gaps.
- Creating awareness for consumers is very important. The Ministry needs to work on this.
- Health and environmental aspects of hazardous waste are intertwined. Being a technical subject, it requires lot of need-based research. However, environmental research has been neglected over the years.
- Whenever an amendment is made in the rules, its implementation must be covered, whether the responsibility allocation is completely un-challengeable.

Participants: Dr Anil Kumar, Mr Paritosh Tyagi, Dr Dipankar Saha, Mr Sanjiv Kumar, Dr SK Gupta, Mr Neeraj Tyagi, Mr Pankaj Kapil, Mr Rajeev Sharma, Mr RN Jindal, Prof Meenakshi Dhote, Mr Yash Sharma, Mr Achal Kumar, Mr Ankit Kumar, Mr Swabrinto Chatterjee, Dr S Sharma

Coronavirus Updates

World closer to the end of the pandemic, says WHO Director General

In a media briefing earlier this week, Dr Tedros Adhanom Ghebreyesus, the Director General of WHO (World Health Organization) said that "the end of the pandemic is now in sight", although its "not there yet". He urged all to not give up and continue to run to the finish line, just as the marathon runner runs harder nearer the finish line. To enable governments to finish this race, WHO has released six policy briefs (available on its website) outlining the actions regarding vaccination, testing and management of COVID-19, including the infodemic of COVID-19 that they can take to win this race… (*Source: UN, Sept. 14, 2022*)

Africa still facing the pandemic threat due to low vaccination

With just 22% of its population fully vaccinated against COVID-19, the continent of Africa is still facing the threat of the pandemic. Ahmed Ogwell Ouma, the acting director of the Africa CDC said that with the low vaccination uptake, "the levels of protection are still relatively low."… (*Source: Reuters, Sept. 15, 2022*)

Israel and Singapore approve the bivalent COVID-19 booster vaccine

Israel has approved Pfizer's COVID-19 bivalent booster for individuals aged 12 years and older. The vaccine would be available in the country by the end of this month. Those who have taken a vaccine dose at least 3 months back are eligible to take the updated booster. Health authorities have urged the high-risk persons to take the updated booster together with a flu vaccine.

Singapore has also authorized the use of Moderna's bivalent booster vaccine for adults aged 18 years and older, who have completed their primary vaccination series… (*Source: Medscape, Sept. 15, 2022*)

With inputs from Dr Monica Vasudev

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