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Review Article

How to protect the children from the third wave of COVID

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ABSTRACT

Introduction: R value of Omicron strain has been recorded at 10 globally and in India the R value has been found to be at 2.69. The R value greater than 1 means that the numbers of cases are growing rapidly and clearly this variant is more contagious than the previous one. More over this wave is affecting children across the country.
Materials and Methods: The data for this review were obtained from studies pertaining to clinical features, epidemiological and immunization trends in children obtained from various journals.
Discussion: As per the recent evidence the Omicron variant is more transmissible, but has less serious health consequences for children than for adults, it is important to avoid infection among children.

1. Introduction

India is facing an epidemic wave of the Omicron variant with a surge in the number of cases all over the country. The Omicron-fuelled third wave has resulted in both breakthrough infections - those who are vaccinated being infected - and reinfections though the cases have seemed to plateau for a few days now. Compared to the previous two waves the symptoms are mild and the duration of illness shorter. Those who are getting infected have high fever, body-ache, throat irritation and mild cough but fortunately respiratory symptoms are mild or none as compared to the previous waves.[1]

1.1. The vulnerable section of the society

The COVID 19 infection is spreading at a rapid rate and has already entered community transmission as claimed by some public health experts. The COVID Third wave has affected children the most as compared to the first two waves and significantly this third wave is considered to be driven by the presence of the new variant- OMICRON. The R value of the There has been an increase in the number of COVID infections amongst children with many presenting with symptoms of fever, chills, respiratory symptoms and diarrhea as the most commonly reported. Children with comorbidities who have contracted COVID are more likely to require hospitalization.[2]

Most published data in the first and second wave suggested that children with covid-19 were usually asymptomatic or mildly symptomatic and that mortality from.

Children are the most vulnerable section of the society and some of the reasons may be because it is tough for children to maintain social distancing and wear masks for a longer duration of time as compared to adults because of which they become more vulnerable to the virus. Another reason is that the respiratory tract of children is smaller than adults and the new omicron variant is primarily an upper

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tract infection due to which children are getting affected. UNICEF had also quoted that Children were the hidden victims of the COVID pandemic.[3]

1.2. Children getting affected in the third wave

According to Public Health experts with a R value of over 10 globally the Omicron variant is close to Measles in terms of being a highly contagious disease seen mostly amongst the pediatric age group. Children were the least affected in the first two waves of the pandemic but are now getting increasingly affected in this wave; however the numbers are not that alarming and that could be because of less testing among children. Common cold and Covid share similar symptoms and they are often difficult to differentiate between the two leading to milder Covid symptoms getting overlooked.

As per WHO interim report older children and younger adolescents (5 to 14 years) contribute to 7% (70,58, 748) of reported global cases and 0.1% (1, 328) of reported global deaths. It is to be highlighted that as the age group increased to (15-24 years) the proportion of cases contributing to the global case load increased to 15% (1, 48, 19, 320) and 0.4% (7,023) of reported global deaths. Deaths for all ages less than 25 years represented less than 0.5% of reported global deaths.[2]

According to a recent report published it was revealed that children requiring hospitalization was on the rise especially those with co morbidities such as type 2 diabetes, asthma, heart and pulmonary diseases, and neurologic, neurodevelopmental (in particular, Down Syndrome) and neuromuscular conditions. Another report by the Delhi government revealed that about seven children lost their lives to this variant out of which six had severe co morbidities. In India, data pertaining to children's deaths and hospitalization due to Covid is unclear. The numbers don't corroborate with the situation on the ground, where doctors and specialists are treating dozens of children in their out-patient departments or through online consultations.

As per the serosurvey done in India during June-July 2021 after the country recovered from the second wave (Delta variant) showed that seropositivity in children aged 6-18 years was similar to that in older age groups - except in those older than 60 years in whom the immunization rate was high. Thus, it was inferred that children of all ages can become infected and can spread the virus to others.[2,3]

It isn't that Children weren't affected by COVID during the first wave and in the second wave due to the delta variant but the numbers were negligible and symptoms were milder as compared to the children getting affected in the third wave.

1.3. Symptoms in children

The most common symptoms are cough, fever, shortness of breath, body ache, sore throat, loss of smell and taste. Besides these children can experience either of one of these- Mild, Moderate or Severe Symptoms.[4] Mild symptoms in children include fever, sore throat, rhinorrhea and cough. They can be easily treated at home with isolation, paracetamol and saline gargles. Moderate symptoms include rapid breathing and Oxygen levels fluctuating between 90 to 95%, in this case the child should be admitted to a COVID dedicated facility. On the other hand the severe form of COVID in children constitutes ARDS, Sepsis, Septic Shock and Oxygen level of less than 90% and this required hospitalization on an urgent basis. Danger signs to be looked out for are- difficulty in breathing, cyanosis or blue lips, chest pain, disorientation or confusion, the inability to drink water or keep any liquids down.

One of the potential complications of COVID in children is MIS-C also known as Multi-system inflammatory syndrome. The early symptoms of this syndrome include fever, sore throat, running nose and cough which may develop into pneumonia, rapid breathing and low levels of oxygen progressing to a hyper inflammatory infection that attacks the heart, lungs, kidney, eyes, brain and skin. This is typically detected in children about 2-6 weeks post covid-19 infection and it can be fatal also in some cases.[5]

2. Indian scenario of vaccination

Under the National COVID Vaccination Program, from 16th January to 30^{th} April 2021, 10 0% of vaccine doses were procured by Union Government of India and was provided free of cost to State Governments for administration to the eligible population through state COVID vaccination centers. To ramp up the pace of vaccination, private hospitals were also roped in where individuals could also choose to get vaccinated at a prescribed rate by the institution and individuals who could afford to pay for the vaccines were encouraged to pay for the vaccines.

Many States faced difficulties in managing the funding, procurement and logistics of vaccines which impacted the pace of the National COVID Vaccination Program after which the Guidelines for National COVID Vaccination Program were reviewed and revised. Under the Revised Guidelines Government of India procured and distributed 75% of the vaccines being produced by the domestic manufacturers and distributed it free of cost to States/UTs.[6]

In order to incentivize production by the vaccine manufacturers, domestic vaccine manufacturers were given the option to also provide vaccines only up to (25% of their monthly production) directly to private hospitals.

Keeping in view the recent global surge of COVID-19 cases, scientific evidence, and global practices along with detection of Omicron variant which has been categorized as

a Variant of Concern (VOC), the government of India started vaccination for the age group of 15-18 years of age from 3^{rd} January 2022. For which indigenous vaccine (Covaxin) is being used as this is the only vaccine with EUL for age group of 15-18 years.

The beneficiaries can avail information about vaccination and pre-book their vaccination slots on CoWIN platform. All government and private vaccination centers also provide onsite registration facility for the individuals.

In order to avoid confusion and operational errors in vaccine rollout for the children the Union health minister directed the state governments to take necessary steps such as setting up of separate Vaccination sites for children, separate Covid vaccination centers (CVCs), separate queue (if at same session where adult vaccination is ongoing) and separate vaccination team (if at same session site) to avoid mixing of vaccines at the time of administration in the age group of 15-18 years.

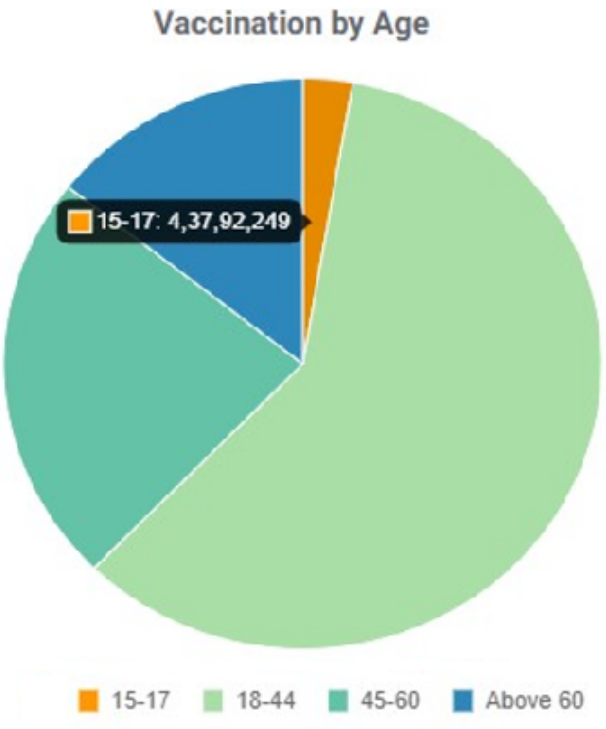

Fig. 1:

For the COVID vaccination program, Government of India started proactive steps as far back as April 2020 which included:

1. Establishment of "Task Force for Focused Research on Corona Vaccine" which was constituted in April 2020 with the objective to encourage domestic Research and Development of Drugs, Diagnostics and Vaccines.

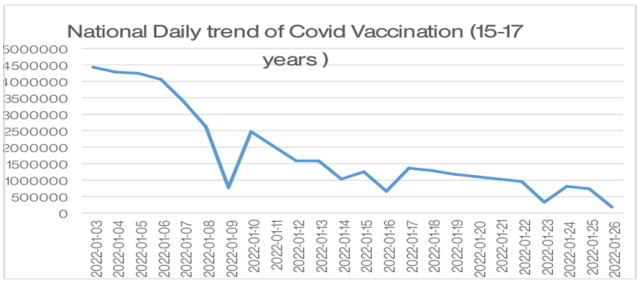

Fig. 2:

2. Creation of "National Expert Group on Vaccine Administration for COVID-19" (NEGVAC) which had the primary task to formulate a comprehensive action plan for vaccine administration.
3. Setting up of "Empowered Group on Vaccine Administration for COVID-19" in January 2021 to facilitate optimal utilization of technology to make COVID vaccination all inclusive, transparent, simple and scalable for the eligible population.[7]

3. Methodology

The authors focused on finding data pertaining to the epidemiology of COVID-19 Omicron variant in various studies retrieved from PubMed, Elsevier, NEJM, and Google Scholar. The main keywords used were "clinical features of COVID-19 in children," "Omicron variant," "SARS CoV-2 third wave," and "COVID-19 vaccination". Searches were concluded by January 31^{st} 2022. The papers found on initial searches were screened by titles and abstracts. Studies that included clinical symptoms, laboratory findings, and radiological features were included.

4. Discussion

4.1. Covid severity in children

In the view of a large number of children and adolescents infected with SARS-CoV-2, the impact of even a low prevalence of persisting symptoms will have a considerable effect on the health of the children. However, in the majority of studies, symptoms did not persist longer than 3 months. However, one study that did find a difference between the cases and controls with persisting symptoms i.e. at 28-30 days post COVID) reported that by 2 months, most symptoms had resolved, suggesting that long COVID might be less of a concern in children and adolescents than in adults.[8]

At a first glance the study conducted in New South Wales suggested that schools had a limited role in the transmission of Covid virus reported between January and April 2021, although a large outbreak was reported from a childcare center. The biggest strength of this particular study was its longitudinal nature. Distance learning was the preferred

mode of education for most students in March, after which school attendance dropped to less than 5%. Only 44% of close contacts were tested (the majority after developing symptoms), so cases in children may have been missed.[9]

This is to highlight that the investigation conducted in children has often been neglected resulting in insufficient testing in this demographic population. Moreover majority of the studies of COVID-19 and children have been conducted during lockdown periods or at a time when there was significant low community transmission. In countries that had a proactive approach in Covid management, cases were rapidly isolated and quarantined and further limiting spread to children. This is of particular relevance given the high prevalence of asymptomatic infection among children, and also increases the likelihood that index cases in children will be missed.

4.2. Vaccination

In light of new evidence it does appear that SARS-CoV-2 infections are more prevalent in adolescents compared to the elderly population. It is estimated that there is a 9% rate of transmission to others within the household of which transmission from children to other family members is common. Moreover, children may excrete the virus in stool periodically. Thus, the need for pediatric immunization has increased even more for this age group.[10]

As of June 29, 2021, there have been approximately 4200 cases of MIS-C reported in the U.S. These children are often admitted to the intensive care unit, frequently require protracted hospital stays, and are at risk for substantial morbidity (including thrombosis, stroke, and myocardial dysfunction) and occasional mortality. Prevention of this worrisome complication of SARS-CoV-2 provides yet another compelling reason to implement a program of COVID-19 vaccination in young children.[11]

4.3. Preventive strategies for children

As most of the cases of Omicron are of mild or asymptomatic nature but children with mild or no symptoms may act as drivers of transmission within their communities.

1. Children and families need to work together as a unit in order to reduce the risk of coronavirus infection
2. All family members to receive COVID-19 vaccinations as soon as they are eligible, also parents to make sure to not miss the routine immunization for other diseases.
3. Parents and caregivers to be aware about the signs and symptoms of COVID-19 and be on the lookout for serious symptoms of the disease in children. And to ensure that children limit close contact with adults who are vulnerable, such as those with health conditions.
4. To avoid poorly ventilated or crowded spaces.
5. Open windows to improve ventilation indoors.
6. Parents should remind children to avoid touching their face as much as possible and also ensure proper sanitization of their toys.
7. Making sure children have clean hands and practice respiratory etiquette, where they sneeze into their elbow and they wash their hands appropriately with soap and water or use an alcohol-based rub.
8. Parents can ensure and limit in-person play with other children, and be sure that children wear masks properly with clean hands, make sure that the mask is put on over the ears, covers their nose and their mouth and that the children don't touch the outside of their masks while playing.

In case a child develops mild symptoms the following strategies can be followed to ensure they recover soon-

1. Paracetamol to be given every 4-6 hours in cases of fever.
2. Warm saline gargles in case of cough.
3. Steroids to be completely avoided in asymptomatic and mild forms of Covid, given only to hospitalized children in a serious condition.
4. Avoid Chest scans unless absolutely necessary
5. Remdesivir to be avoided in children.
6. No need of any testing in case of asymptomatic and mild forms of the disease.
7. Blood and urine tests to be undertaken in serious and hospitalized children.

In case of isolation, a chart should be made to monitor Fever, blood pressure and oxygen levels every 6 hourly. Any bluish discoloration of the lips or nail beds should be monitored and if the oxygen level drops to 90-93% a strict monitoring of the child should be undertaken. In case of any danger signs the child should be rushed to the hospital or to a COVID care facility.

In addition to all the above mentioned measures the government released guidelines which included a six-minute walk test that is recommended for children above 12 years of age under the supervision of parents or guardians. It is a simple clinical test to assess cardiopulmonary exercise tolerance and is used to unmask hypoxia. A pulse oximeter is attached to his/ her finger and the child is asked to walk in the confines of their room for 6 minutes continuously.[12]

5. Conflict of Interest

The authors declare no conflict of interest.

6. Source of Funding

None.

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