



Editorial

COVID-19 Infection in Children

Corona virus disease-2019 (COVID-19) is a global health crisis. The clinical characteristics, disease progression, and outcomes in children and young adults appear significantly milder compared to older individuals. Since first being reported in Wuhan, China in December 2019, COVID-19 has rapidly spread to affect over 215 countries worldwide. According to the World Health Organization (WHO), there have been 79,232,555 confirmed cases and 17,54,493 deaths worldwide up to December 27th, 2020¹. Disease burden of COVID-19 in children is difficult to determine because case definitions for screening, testing, and disease severity in children are not universal and the proportion of asymptomatic infected children is high². Furthermore, children exhibit certain particularities and cannot clearly describe their own health status in contact history which has contributed to the severe challenge of protecting, diagnosing, and treating this population³.

In reports from countries that were severely affected early in the course of the pandemic, children comprise 1-2% of the diagnosed COVID-19 cases, 56% of children with COVID-19 demonstrated clear evidence of transmission through family gatherings, the age ranged from 3.3-11 years in different reports, and like in the adult population, there is a male predominance². The possible reasons for the lower number and milder infections in children and young adults include lower exposure to viruses, being isolated at home, and minimal exposure to pollution and cigarette smoke, all of which contributing to a healthier respiratory tract. The immune response of children differs from that of adults, which progressively deteriorates with age, such as preschools, which have a repertoire of immune cells 5-10 times larger than that of a 50-year old, and 20 times larger than that of an 80-year old. This may play a role in mitigating the spread of the virus and in the cytokine signaling cascade triggered by SARS-Cov-2. They relate to severe outcomes in adulthood⁴. Viral co-infection may be important in limiting SARS-Cov-2 replication through direct virus-to-virus interaction and competition. Additionally, the distribution, maturation, and functions of viral receptors may be important in age dependent susceptibility to severe COVID-19⁵.

However, good regenerative capacity of the lung could explain the overall less severe and early recovery of COVID-19 in children compared to older patients. Also, due to greater upper airway resistance in children, aerosol particles deposit more in the tracheobronchial tree than in the alveoli⁶.

The clinical spectrum of COVID-19 is wide, varying from completely asymptomatic forms to those characterized by severe respiratory distress requiring intensive care. De Souza TH et al.⁷ found 14.2% asymptomatic, 36.3% mild, 46% moderate, 2.1% severe, and 1.2% critical cases in children. Dong et al. in the largest paediatric review of 2143 children, described that 13% of virologically confirmed children were asymptomatic⁸.

Asymptomatic children may play a major role in community based viral transmission. Available data suggests that children may have more upper respiratory tract involvement than lower respiratory tract involvement⁸. Also, faecal shedding of the virus in the stool continues for several weeks after diagnosis⁹. Concerns have been raised about faecal oral transmission of the virus, particularly in infants and children who are not toilet trained and have viral replicates in the gastrointestinal tract¹⁰. Prolonged shedding in nasal secretions and stool has substantial implications for community spread in child care centers, in schools and in homes.

For the symptomatic children requiring hospital admission, the most common presenting symptoms are fever (70%), cough (39%), nausea/vomiting (32%), and shortness of breath (30%)⁶. The neonatal age group, male gender, lower respiratory tract disease, and preexisting medical conditions such as heart disease, asthma, neurological and genetic disorders were all associated with ICU admission².

Laboratory diagnosis of COVID-19 in children is mostly unremarkable. For COVID-19, RT-PCR testing of nose and throat swabs for detection of SARS-Cov-2 nucleic acid has been recommended as the confirmatory test. Full blood counts are normal in most cases; leucopenia, neutropenia, or lymphopenia are less common. Abnormal C-

reactive protein, procalcitonin, liver enzymes or CPK are also present in a few cases. However, a good number of paediatric patients can have abnormal CT findings characteristic of COVID pneumonia even in asymptomatic or mild to moderate clinical category⁶.

For the few children who will require admission to a healthcare facility, the cornerstone of management is supportive therapy, including adequate nutrition and calorie intake, correction of fluid and electrolyte imbalance, and oxygen supplementation. Antibiotic maybe indicated if bacterial super infections suspected. World Health Organization has not recommended any specific treatment for children until the results of ongoing clinical trials are available. We strongly believe that clinical trials of all therapeutic agents for COVID-19 are needed in children as well⁵.

Since May 2020, several highly endemic countries have reported an exceptionally high incidence of multisystem inflammatory syndrome (MIS) in children, which was associated with coronavirus disease 2019. Several case definitions were proposed. All include fever, elevated inflammatory markers, and organ dysfunction not attributed to another infectious cause. The higher rate of positive RT-PCR suggests a late disease complication².

A targeted surveillance of MIS in children from March 15 to May 20 in paediatric health centers across the United States showed that the organs involved in MIS in children were GIT (92.2%), followed by CVS (80%), haematologic (76%), mucocutaneous (74%), and respiratory (70%). About 80% require intensive care, 20% mechanical ventilation, and 48% vasoactive support. Mortality was 2%. Thus, the study concluded that MIS in children associated with SARS-Cov-2 led to serious and life-threatening illness in previously healthy children and adolescents¹¹.

During this era of the COVID pandemic, Bangladesh is also experiencing COVID-19 among paediatric patients. However, published reports and research papers on paediatric COVID are scarce. We strongly believe that a large cohort study with a bigger sample size and effective control groups using different duly regimens should be conducted in the near future in this country.

Though SARS-Cov-2 infection causes fewer fatalities among children, the need for vaccination cannot be underestimated. The COVID vaccine is currently recommended by the CDC for children over the age of 12. But it should be duly extended to cover other paediatric age groups as well⁶.

However, there is still much that we need to learn about the impact of this virus on children as well as the impact of children on viral spread. It is important that both medical and social efforts focusing on the paediatric population are undertaken to protect the children of the world, allowing them to fulfill their enormous potential.

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