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# Pediatric Hematology Oncology Journal

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## Impact of COVID19 on children with blood and cancer disorders

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Covid19 pandemic has altered the world we live in for forever. It has proved fatal for so many people globally and caused morbidity in millions. Coming to children with blood and cancer disorders; we all had no idea how will this immunocompromised population handle this new virus [1]. Pediatric Hematology Oncology (PHO) chapter of Indian Academy of Pediatrics (IAP) brought out timely guidelines on how to run PHO services during COVID19 pandemic [2]. Pandemic tested our ability to manage these immunocompromised children safely and provide them timely appropriate therapy for the underlying disorder. Lockdowns dented accessibility of care and need for isolation facilities for COVID19 patients further complicated care of PHO patients.

In this special issue focussed on COVID19 in PHO we have been able to get first glimpse of Pan-India impact of COVID19 on children with cancer [3]. Of the 659 children with cancer diagnosed with COVID19, 30 died (4.5%), however only 7 of the deaths were directly attributed to COVID-19 infection (1%). The majority of the children (72%) were diagnosed during screening and did not have any symptoms. They recovered with observation only and did not require any intervention. The number of children that presented with symptoms were 124/659 (18.8%) [3]. Its commendable that despite all the hurdles due to pandemic cancer care for children continued and most children stayed well.

Second wave of COVID19 in India was driven by Delta variant and caused far higher mortality and morbidity in general population. Health infrastructure was tested to its limits in the second wave with lack of hospital beds and lack of oxygen being the main problem. Bansal et al. have reported impact of second wave on children with blood & cancer disorders. Of the 17 patients diagnosed with COVID19, 10 (58.8%) required hospitalisation and one child needed ventilatory support but there was no mortality. Though the number of pediatric patients with COVID-19 infection were more during the second wave but majority had mild to moderate symptoms [4]. In another study comparing impact of two waves of COVID19 in India showed that most children had milder disease but in second wave more children needed intensive care [5]. A study by Yadav et al. showed that COVID-19 in children

with blood & cancer disorders is mostly asymptomatic and can be managed at home. However, it does lead to treatment delays and post covid complications. Cycle threshold (Ct) values of PCR test for COVID19 have wide variation and do not predict severity. Interestingly, 3 children in this study had reactivation/reinfection on restarting chemotherapy [6]. One child being treated with Anti-CD20 monoclonal antibody, Rituximab took much longer time to clear the virus [6].

Bone marrow transplant (BMT) is another service which was essential to run during this pandemic. Challenges were immense like avoiding COVID19 in the donor so many centres harvested and cryopreserved stem cells before initiating conditioning. Due to global lockdowns availability of matched unrelated donors virtually dried up. In this issue, Chander et al. reported that 3.3% children who underwent HSCT during this pandemic were diagnosed with COVID19. The Ct value in all children was low ( $\leq 17$ ), indicating a profound viremia. Three children with severe infection died, two due to multiorgan dysfunction and one due to Mucor mycosis [7]. Three other studies reported outcome of another 7 BMT patients with COVID-19 of whom 1 child died [4,5,8].

Another dreaded complication seen in post COVID19 period is multi-system inflammatory syndrome in children (MIS-C) which can prove fatal if not treated urgently. Yadav et al. report here MIS-C post BMT in 2 children of whom one died [8]. Another case of MIS-C has been reported in a child with acute myeloid leukemia during induction chemotherapy [9]. Post COVID19 MIS-C was reported in another child with thalassemia post BMT [7]. Three other children developed MIS-C and recovered with supportive care [5]. It's quite surprising that children post BMT or AML therapy were very immune-suppressed yet they are able to mount such severe inflammatory response post COVID19. In another study, although MIS-C is not mentioned as a diagnosis but steroids were given to 7/17 (41.1%) patients. Six patients were given steroids as the inflammatory markers were high and all recovered [4].

Now coming to impact of COVID19 on non-malignant hematological conditions in children, in this issue few reports have described this aspect also [4–8,10–12]. Kakkar et al. have reported a cohort of 14 patients with thalassemia and COVID19 patients of whom only 2 needed hospitalisation. The underlying diagnosis of transfusion-dependent thalassemia did not lead to excess morbidity and mortality [10]. Authors also highlighted that older thalassemia patients and those with co-morbidities had higher risk of mortality due to covid19. One child with Sickle cell disease post BMT developed COVID19 and recovered uneventfully [4]. Although data on sickle cell disease and COVID19 is sparse from India but Covid19 can lead to significant morbidity and mortality especially in older patients of sickle cell disease.

Data on COVID19 in children with inborn error of immunity (IEI)

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is scarce. Yadav et al. report 2 cases of mild COVID19 in a cohort of 31 children with IEI [11]. Authors discuss various published studies and propose that COVID19 may have varied presentation and outcome in different types of IEI and more data needs to be captured. Another study reported a child with familial hemophagocytic lympho histiocytosis (HLH) and COVID19 who developed MIS-C and coronary artery dilatation but recovered fully [5]. In another report impact of COVID19 in 3 children with severe aplastic anemia (SAA) is reported. All three were treated with immune suppressive therapy and 2 children died [12]. Authors discuss various aspects like COVID19 as etiology of SAA or causing its relapse, to treat or not to treat SAA in children with COVID19 etc.

Overall, children with blood and cancer have mostly coped well with COVID19 Pandemic. Treatment breaks were significant for few children and mortality although rare but did occur in few. MIS-C made many children need PICU care.

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