

COVID-19 and Congenital Heart Disease: Perspectives From a Resource-limited Setting

Due to the emerging nature of the coronavirus disease (COVID-19), its effect on children/adults with congenital heart disease (CHD) are yet unknown. In developed countries, the majority of patients undergo effective surgical and/or catheter interventions in childhood. Thus, only a small proportion of patients have residual defects, and may be more prone to COVID-19 complications [1]. However, in a country like India, where large numbers of patients either remain unoperated or are just palliated, there is a possibility that severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection may be detrimental to such patients. Not only the risk of SARS-CoV-2 infection may be higher as compared to age-matched controls, the additive burden of COVID-19 can further compromise the facilities in already scarce cardiac care programs [2]. The categories of pediatric patients with cardiac disease, likely to be at a higher risk of severe COVID-19 disease are: cyanotic congenital heart disease with pulmonary artery hypertension (PAH) or severe cyanosis (SpO₂ <80%), acyanotic congenital heart disease with PAH, acyanotic congenital heart disease with severe stenotic lesion, primary or secondary pulmonary hypertension, Eisenmenger syndrome, cardiomyopathy with severe ventricular dysfunction, and post-cardiac transplant patients [3,4].

Using recommended clinical criteria for hospital admission [5,6] in children with congenital heart disease might lead to many of these being hospitalized, who could otherwise have been managed at home. Children with acyanotic CHD with increased pulmonary blood flow have higher than normal resting respiratory rates even in healthy state, and some signs of respiratory distress are present due to heart failure. Children with cyanotic CHD, have low baseline saturation (<92%) and cyanosis due to their cardiac pathology. Due to these reasons, differentiating COVID-19 pneumonia from congenital heart disease can be very difficult. Therefore, in children with CHDs, the admission criteria [5,6] should not be used in isolation for hospitalization. Rather a wholesome clinical evaluation will help in triaging such patients.

Apart from the hemodynamic burden, some of these children might have reduced immunity, due to Down syndrome, DiGeorge syndrome and asplenia and therefore, may be at even higher risk for poor outcomes with COVID-19 infection [7]. Tele-consultations are being promoted for patients to maintain social distancing to avoid disease spread. In pediatric cardiology programs, teleservices do not suffice because many children suffering from congenital heart disease require surgical intervention or percutaneous intervention or diagnostic catheterization.

As children are less susceptible to COVID-19, the threat is indirect *i.e.* the delay in surgical/per-cutaneous interventions. Depending on local circumstances, many pertinent factors

have to be weighed on case-to-case basis. Factors which need to be focused upon include resource utilization, such as anticipated ventilator duration, and ICU stay; clinical status of the patient and risk of delaying intervention, and; risk of exposure for the patient, family, and healthcare staff [8]. During the current situation, where healthcare personnel are themselves contracting the disease, optimal timings for congenital heart surgery [9] may not be practical.

We do not know much about the COVID-19 disease in children *per se* and specially in those with heart disease [4,5]. According to the local scenarios, such decisions have to be taken in individual capacity, keeping the interest of the patient as well as health care facility in mind. Providing teleservices and social distancing, triaging the patients into subgroups and focusing on the ones who need immediate intervention is a win-win situation for all the stakeholders *viz.* patient, family, health care personals, and the community at large.

Published online: May 28, 2020; PII: S097475591600187

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Medical Education During the COVID-19 Pandemics – Challenges Ahead

We read with interest the study on medical education during the coronavirus disease (COVID-19) Pandemic by Singh, *et al.* [1]. The authors have succinctly described the effect of social distancing on medical education in the wake of the pandemic.

Medical education is based essentially on pillars of knowledge, skills, behavior and communication skills, which need to be developed in medical students. While knowledge and deep learning actively require teacher-learner interaction in a conducive environment; skills, behavior and communication are difficult to cultivate without real time student-patient interaction.

Although didactic class room teaching, presentations, demonstrations and bed side teaching learning have largely been replaced by self-directed learning (SDL) and online teaching learning platforms, but the benefits of direct teacher student contact and real time two-way feedback are difficult to replicate at online forums [2]. Well-structured small group online teaching during this pandemic can improve teacher student interaction and initiate a deeper learning experience too [2]. Although adopting this format of teaching learning may not be easy for students with low motivation and from lower socioeconomic strata due to lack of equipment and connectivity, adapting to these new changes in medical education is the only way forward [2].

At our institute, we are using WebX platform for imparting online teaching to four hundred and twenty undergraduate students from four undergraduate medical batches. It is a real time large group teaching for all the subjects of the respective batch; each class lasting forty five minutes as per the approved curriculum. The presented lectures are posted online and are

accessible to all for future reference. Small group teaching (4 to 5 learners in each group) for active participation and in-depth learning is also conducted through this platform. Some guidelines are available to conduct student assessments, but the modalities of conducting annual assessments is open to discussion [3,4].

In the era of social and physical distancing, actual student-patient interaction may not be possible but practical skills still can be facilitated by online videos on patient examination followed by students practicing on simulation and virtual reality platforms, while attributes like attitude and communication skills can be practiced on inpatients, maintaining social and physical distance. As development of clinical skills, attitude and communication in a medical student are integral part of medical education, we have to discuss and deliberate how these attributes can be addressed on online platforms.

Published online: July 24, 2020; *PII:* S097475591600212

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