COVID-19

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The last year has been a true test of our resilience in so many ways. Our health and the health of our patients has been tested by COVID-19. This virus has been present for over a year and yet what we know continues to evolve. The areas that we work in are two of the least understood areas with regard to the behavior of this virus. The way we practice medicine has changed greatly and possibly forever. While the silver lining may be difficult to see, there have been some positives brought about by the adoption of new ways of both practicing medicine and living life in general. Our goal here is to take a broad look at the impact COVID-19 has had on the pediatric heart transplant population.

Since the onset of the pandemic, over 1 million children have been diagnosed with COVID-19. That number in and of itself is staggering, but it is likely an underestimation as children are often asymptomatic and therefore not tested. The American Academy of Pediatrics (AAP) reported that 1.7% of all COVID-19 hospitalizations and 0.06% of the deaths have been among children. (1) Approximately 1.6% of children who tested positive have been hospitalized and 0.01% of children have died. (1) Children have suffered greatly from the pandemic despite having less severe disease than adults and a smaller number of COVID-19 cases in various ways. The number of ER visits for mental health issues have increased. (2) This is felt to be due to the upheaval in their daily lives with less well-developed tools with which to cope, the social isolation of not attending school, and the anxiety about getting sick that they may absorb from adults. It also impacted preventative care, especially in low-income families and those of color. Children did not receive regular vaccinations, mental health screenings, or preventive dental care, most notably in the early days of the pandemic. (1) The AAP is working diligently developing guidelines pertaining to testing, protective gear and most notably return to school. With the help of the AAP, support of the pediatricians and the government leaders, we hope to implement further strategies to combat the above-mentioned effects of the pandemic.

As for the pediatric transplant patient, early data from the PHTS indicates that there is no difference between the general pediatric population and solid organ recipients. As per the latest COVID-19 dashboard (see below) that is put out by the PHTS, there are a total of 190 COVID-19 cases in pediatric population (currently listed or transplanted) with 176 patients confirmed by a nasal swab. The median age at diagnosis is 14 years and the patients are usually 6 years out of their heart transplant at the time of infection. The majority of patients recovered from the infection. The details of these findings will be further discussed at the International Heart and Lung Transplant (ISHLT) meeting. Thus, transplant recipients seem to have a disease course similar to the general pediatric population, despite being on immunosuppressive medications.

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The pandemic and the quarantine that has followed has led to the way we lead our personal and professional lives. Zoom slowly became embedded in our daily lives. Our patient care meetings, professional scientific meetings, and administrative meetings all shifted to virtual meeting platforms. Attendance soared as it became more convenient to reach back-to-back meetings. The ease of connection also allowed the development of educational seminars that reached a growing audience. Virtual scientific meetings were able to take place both nationally and internationally without the exposure in high-risk areas. Virtual meeting platforms also led to providing virtual patient care. Telemedicine provided an acceptable way to see patients safely. It was assimilated with the medical record and became a routine. Many anticipate that it will last beyond the pandemic.

As of January 2021, there are 5 vaccines available against COVID-19. Pfizer and Moderna have shown to have ~95% efficacy against symptomatic COVID-19. Both these vaccines received emergency authorization by the US FDA in December 2020. Roughly 23.5 million COVID-19 vaccine doses have been administered in the country as of the end of January 2021 and the side effects are closely being monitored. (3) For every million doses of COVID-19 vaccine administered, about 372 nonserious adverse events and 45 serious adverse events have been reported. (3) Anaphylaxis seems to be extremely rare, occurring in five of every million doses of the Pfizer-BioNTech vaccine and 2.8 per million doses of Moderna vaccine. Given the immune system of children is actually very different from that of adults, the jury is still out on the vaccine, as there is no data for children under the age of 16 years. The pediatric burden of COVID-19 is not as high as it is in older adults, but it still is significant, making vaccination in pediatric patients an important topic. While the Pfizer vaccine is approved for age >16 years, Moderna is approved only above age 18 years. Regarding pediatric trials, Pfizer completed the enrollment of 2000 pediatric volunteers (12-15 years) in December 2020 and is expected to seek authorization in the early half of 2021. (3) Moderna is currently enrolling 3000 pediatric volunteers (12-17 years). In addition, AstraZeneca is starting pediatric trials on their vaccine in the U.K. However, kids less than 12 years of age still seem to be a bit of a black box, especially in the absence of any data. In addition, none of the trials seem to be enrolling children on immunosuppressive medications. Thus, the onus is on our community to advocate studying the vaccine in pediatric solid organ transplantation.

The Journal of Heart Lung Transplantation (JHLT) recently published an editorial on vaccination in heart transplant recipients. (4) They acknowledged that transplant recipients were excluded from the vaccine trials, so neither efficacy, durability, nor safety are known in this patient subpopulation. However, given the experience in this patient population with the influenza vaccine and adjuvanted recombinant zoster vaccine, one can extrapolate the data to the COVID-19 vaccines, which are not live virus vaccines. Given the clear benefits in non-transplant recipients and the emerging studies about their safety and

efficacy, they believe that SARS-CoV-2 vaccination is essential and strongly support and encourage vaccination of our transplanted recipients. However, they did address the fact that observational studies, especially by registries, are needed to assess the immunogenicity and the safety of the vaccine in this unique population.

References:

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4. Aslam S et al. J Heart Lung Transplant. 2021 Jan 2;S1053-2498(20)31883-0. (PMID: 33487534)

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PHTS Registry COVID-19 Dashboard

PHTS is releasing an updated dashboard every other Monday. The information reported in this dashboard is a direct reflection of data reported to the PHTS registry by participating hospitals as of the date listed on the dashboard. To view the full dashboard, visit www.phtsociety.org.



