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Letter to Editor

Surgical VSD closure in post-COVID cohort: A double whammy!

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Dear Editor,

The COVID-19 pandemic continues to appall the medical fraternity with its unprecedented after-effects, such as the ardently debated post-Covid Syndrome. Albeit reports of good prognosis in paediatric population ailing from COVID-19, regulatory bodies suggest special caution with respect to COVID-19 related complications in children with congenital heart disease (CHD) prone to hypoxemia, deranged haemodynamics, and end-organ dysfunction.[1] Herein, pulmonary circulation dynamics deserve particular attention given the fact that a past COVID-19 infection can potentially compound the CHD-associated pulmonary hypertension (PH).[2]

The turbulent postoperative course of three children undergoing a surgical closure of ventricular septal defect (VSD) with a history of COVID-19 infection 3-4 months back, bears testimony to the aforementioned.

1. Cases 1 and 2

Two children aged 2.5 and 2.0 years with large VSDs (1.1 cm and 1.4cm respectively) demonstrating non-restrictive shunt and moderate PH, had a tumultuous perioperative course with post-cardiopulmonary bypass (CPB) pulmonary arterial systolic pressure (PASP) reaching suprasystemic levels requiring repeated circulatory assistance. Owing to the perturbed pulmonary haemodynamics, inhaled nitric oxide (10-20 ppm) was administered and continued postoperatively alongside other measures such as milrinone and adrenaline infusion, modified ultrafiltration, lung recruitment with application of positive end expiratory pressure (PEEP).

2. Case 3

3 year old male demonstrated a small, 0.4 cm VSD with restrictive shunt across the septal defect. This child also developed post-CPB PH with 50-60 mmHg PASP (two third the systemic pressures), and consequently right ventricular dysfunction (RVD) resulting in difficult CPB-weaning and repeated desaturation and perturbed haemodynamics. While the above mentioned measures were again employed to successfully wean the child, the index-case was intriguing as a restrictive-VSD is physiologically expected to prevent substantial pulmonary over flooding or PH.

Envisaging the first two cases as a plausible accentuation of PH owing to a double-hit (cardiac disease and post-COVID status), the postoperative PH-crisis in the third patient was likely a repercussion of previous COVID-19 infection. Needless to say, the former potentially predisposes general surgical population to poor-outcomes,[2] the attributable risk further enhances in the background of a well-known systemic inflammatory response to CPB. Meanwhile inflammation classifies as a pivotal contributor to postoperative PH (especially concerning in context of an enhanced pulmonary blood flow (PBF), as cited above in

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VSD cohort), our previous experience with a cyanotic child (preoperative decreased PBF) succumbing to a post-CPB hyperinflammatory response in background of an occult COVID-19 infection, is in itself alarming.[3]

Talking specifically of COVID -19 related pulmonary vasculopathy, extensive pulmonary damage with persistent inflammation, endothelial injury with hypercoagulability, thrombotic microangiopathy, hypoxic vasoconstriction, and concomitant myocardial injury are the potential factors responsible for new-onset PH or worsening of preexisting PH.[2,4] Literature reports 13.4% incidence of PH in COVID-19 infection with high PASP predicting higher incidence of ICU admission, mechanical ventilation, extracorporeal membrane oxygenation, and higher mortality.[5] Postoperative PH with RVD persisted in all our three patients necessitating a 48-72 hours mechanical ventilation prior to extubation. This is in corroboration to the Tudoran C et al. suggestion of a persistent PH with RVD even after two months following recovery from COVID-19.[4]

With the elective surgeries resuming in a population that has borne the brunt of pandemic, experiences like these need to be highlighted in order to prepare the perioperative physician fraternity to battle the COVID-19 aftermath effectively.

3. Conflict of Interest

None.

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