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EDITORIAL COMMENTARY

Hemodynamically Significant Patent Ductus Arteriosus (HsPDA) in a Preterm Infant – An Innocent Bystander or a Predilection for Disaster?

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A hemodynamically significant patent ductus arteriosus (HsPDA) in a preterm infant remains an object of controversy as far as the decision for screening, treatment, and modality of treatment. The heart of the controversy is the fact that preterm PDA has been implicated in several clinical outcomes. These include chronic lung disease (CLD), necrotising enterocolitis (NEC), intraventricular haemorrhage (IVH), pulmonary haemorrhage and acute kidney injury (AKI) [1]. However, treatment of the HsPDA has not shown a reduction in any of these morbidities. This has been supported by the fact that conservative management with watchful expectancy has resulted in successful closure without adverse effects [2]. The trials on HsPDA, however, have had some limitations, namely the heterogeneity in the definition of HsPDA and lack of a standardized approach to measurable hemodynamic effects causing clinical instability [3]. The most common definitions of HsPDA use the size of the PDA in combination with one or more parameters of pulmonary over-circulation or systemic hypo-perfusion. The left atrium to aortic root ratio >1.4 with diastolic flow reversal in the abdominal aorta is the commonly used parameter. These parameters individually are not specific to a HsPDA and must be taken in combination and the best approach widely remains unknown.

In short, preterm HsPDA is a spectrum that can transition from physiological normality to a devastating problem causing varying effects on major organs. This has led the physician treating the infant, at the bedside to stand at a crossroads between the wait-and-watch approach vs. the treatment approach. The big question is "What is worse? The disease or the treatment? [4]"

The study by Zhang et al. published in Indian Journal of Pediatrics, is a randomized trial that looks at a combination of cardio-pulmonary effects of the HsPDA [5]. Physiologically, an objective measurement of HsPDA on the lung is an important consideration for the treatment of the same. In the study by Zhang et al., it was found that lung ultrasound was used as a tool to guide the continuous positive airway pressure (CPAP) setting, and indirectly, surfactant administration and HsPDA treatment were not based on a single screenshot but rather serial monitoring that indicated worsening. The results showed that the study group required more aggressive interventions namely higher CPAP settings, earlier use of ibuprofen, and more infants getting ibuprofen for HsPDA closure. However, this translated into better outcomes such as less use of invasive ventilation and reduced moderate-severe bronchopulmonary dysplasia (BPD).

The study has limitations as pointed out by the author, namely that the sample size was small and a per-protocol analysis was used. Additionally, an older definition of BPD was used and it remains to be seen if the results would alter if a recent definition of BPD was used. But the idea of using serial monitoring of HsPDA and using cardio-pulmonary ultrasound as an add-on is novel and would provide more convincing evidence to the clinician at the bedside to decide on treatment. It would probably aid to balance between the harms caused by the disease vs. treatment. However, it needs to be explored in larger trials to provide more evidence for this approach.

Declarations

Conflict of Interest None.

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