

## **Conservative Management of Persistent Pulmonary Hypertension**

Persistent pulmonary hypertension of newborns (PPHN) is an under diagnosed entity in our country. PPHN can be a common end-point of several different patho-physiological mechanisms. The severer forms of PPHN usually require ventilatory support with or without use of extracorporeal membrane oxygenation and nitric oxide inhalation. The milder forms of this condition can be managed conservatively. We share our experience with one such case.

A male baby weighing 3.75 kg was born to a primigravida by Cesarean section for post-datism and cord prolapse. Apgar score was 7 at one minute. The baby developed tachypnea soon after birth. On the basis of clinical examination and chest X-ray, transient tachypnea of newborn was diagnosed. Oxygen was administered by head box at 4 liters per minutes. On day4, the baby was found to be dusky and hence the oxygen flow rate was increased to 6 liters/ min. Oxygen was stopped on day 6 since the baby appeared to be settling down. Intense cyanosis was noticed within seconds of stopping oxygen and a provisional diagnosis of PPHN was made. Mild changes in color were often noticed especially after handling or after feeds. Blood counts were normal and PCV was 52. ECG was within normal limits. Blood gas analysis was not possible. M-mode echocardiography revealed a structurally normal heart and evidence of right to left shunt across foramen ovale.

The RV and LV functions were normal.

RPEP/RVET was 0.62. Pulmonary acceleration time was 80 msec on Doppler study. Based on these echocardiographic findings, the diagnosis of PPHN was confirmed(1). The management consisted of oxygen by head box at 6 liters/min, prone position, chloral hydrate 25 mg/kg/6 h, expressed breastmilk, 150 ml/kg as slow intragastric feed, oral sodium bicarbonate 5 meq/kg/ day in 6 divided doses and strictly minimal handling. The baby was maintaining pink color on this protocol. Echocardiography on day 31, RPET/PVET dropped to 0.37 and PAT increased to 95 msec. Oxygen administration was discontinued, sedation was gradually omitted and direct breastfeeds were commenced. The baby went home on day 35. Neurodevelopmentally the child was normal at 18 months.

Marked oxygen dependence disproportionate to clinical findings and chest X-ray suggested PPHN and echocardiographic findings confirmed the diagnosis. Pulmonary and cardiac conditions, sepsis and polycythemia were ruled out by clinical examination and investigations. PPHN, therefore, appeared to be primary in this case. By definition, PPHN is present when a baby has: (i) severe hypoxemia; (ii) no severe lung disease or may have mild lung disease but hypoxemia is disproportionately severe for the radiological, clinical and acid base abnormalities; (iii) evidence of right to left shunt; and (iv) echocardiographic confirmation of a structurally normal heart. Severe transient tachypnea of newborn can mimic PPHN clinically and echocardiographically(2). Despite recognition of this entity for more than 2 decades, there is no consensus on diagnostic criteria or treatment. Decades of uncontrolled clinical experimentation have

not yet led to a consensus regarding the optimal mode of therapy(3).

Currently, two options are exercised: (i) aggressive ventilation to maintain normal pO<sub>2</sub>, lowered pCO<sub>2</sub> and elevated pH; and (ii) conservative ventilation accepting modest hypercapnia, acidosis and hypoxemia. In case of non response, high frequency ventilation and/or ECMO are resorted to as rescue therapy. It is occasionally worth giving pulmonary vasodilators in the unventilated spontaneously breathing term neonate with PPHN and ventilate the baby if paO<sub>2</sub> falls below 5-6 k Pa in 95-100% oxygen. Other non-ventilatory modalities of management worth trying include inotropes and magnesium sulphate infusion. Basic measures like thermoregulation, fluid restriction, prevention and treatment of hypoglycemia and hypocalcemia must receive due attention. Since our patient remained pink on the management offered, we persisted with it and did not refer him for ventilatory care. Although, we successfully managed this case, caution must be exercised in administering oral

sodium bicarbonate without documented blood gases and in sedating a non-ventilated baby. Monitoring oxygenation by doing ABG or by pulse oximetry would have been desirable.

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