

## References

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## Neonatology

**OXYGENATION AND CONGENITAL DIAPHRAGMATIC HERNIA** Infants born with a congenital diaphragmatic hernia through the foramen of Bochdalek are often in respiratory distress, with cyanosis in both air and oxygen. Institution of artificial ventilation may reduce  $P_{CO_2}$  to normal but does not produce marked improvement of oxygenation. The possible sources of right-to-left shunt in these cases are: 1) intrapulmonary, i.e., perfusion in non- or poorly ventilated areas due to compromise of expansion by abdominal contents within the chest cavity; 2) through the foramen ovale; 3) through a patent ductus arteriosus. The sources of the hypoxemia in ten neonates born with diaphragmatic hernia through the foramen of Bochdalek were investigated. The infants' ages at time of study ranged from 6 to 76 hours. Arterial blood samples were obtained from the right radial artery and the descending aorta (catheter inserted via the umbilical vein) while the infants were breathing high concentrations of oxygen spontaneously or were being ventilated mechanically. Inspired  $O_2$  was  $71 \pm 4$  per cent (mean  $\pm$  SD), while  $Pa_{O_2}$  of blood from the right radial artery was  $56 \pm 7$  mm Hg higher than that in a sample from the descending aorta.  $P_{CO_2}$  of blood from the descending aorta was  $4 \pm 1$  mm Hg higher and pH was correspondingly lower. All differences were significant. Three of the ten infants died. Paired samples were obtained from three infants after operation; two of these three died. In the survivor, the radial artery-aorta  $P_{O_2}$  difference decreased postoperatively, then increased again transiently. There was no significant difference between mean values in blood from the radial artery and aorta in infants who survived and those who died. The radial artery-aorta  $P_{O_2}$  difference was not affected by spontaneous or mechanical ventilation. (Murdock, A. I., Burrington, J. B., and Swyer, P. R.: *Alveolar to Arterial Oxygen Tension Difference and Venous Admixture in Newly Born Infants with Congenital Diaphragmatic Herniation Through the Foramen of Bochdalek*, *Biol. Neonat.* 17: 161-172, 1971.)

EDITOR'S COMMENT: A worthwhile contribution to the management of practical problems associated with acute respiratory failure in the neonate. It emphasizes the importance of sampling site in the assessment of oxygenation: the right radial arterial  $P_{O_2}$  defines what happens in the lung, while the left may show the added effect of an anatomic right-to-left shunt when flow across the patent ductus arteriosus is reversed. It is unfortunate that a number of interesting problems are not discussed in the paper. We certainly would like to know the cause of the balanced pressures across the patent ductus arteriosus: is it the "space occupying" lesion within the thorax that elevates pulmonary arterial pressure? How does one explain the lack of change in the radial artery-aorta  $P_{O_2}$  difference when these infants are ventilated with increased airway pressure? What was the cause of death? If right-sided pressures are higher than left, can a patent foramen ovale also contribute to postoperative hypoxemia? All these questions and many more underscore the importance of appreciating hemodynamic function when treating respiratory failure.