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## Nitric Oxide in a Premature Infant in the Operating Room

*To the Editor:*—We report the use of nitric oxide to improve oxygenation in a premature infant with presumed persistent pulmonary hypertension of the newborn. A 1-kg, 6-day-old premature and dysmature infant (born at 32 weeks, birthweight 868 g) presented for laparotomy because of a sepsis-like clinical condition in the presence of bowel distension.

Before surgery, the patient required dopamine, dobutamine, and norepinephrine infusions to maintain a blood pressure of 30/20 mmHg. The trachea was intubated, and he was sedated with morphine. Before transport to the operating theater, he had a hemoglobin oxygen saturation ( $Sp_{O_2}$ ) of 95% while the lungs were ventilated with an  $Fi_{O_2}$  of 0.25.

After transport to the operating room,  $Sp_{O_2}$  was about 65% (Nellcor; a good trace was obtained) with an  $Fi_{O_2}$  of 1 and decreased further when attempts were made to ventilate the lungs using a Siemens Servo 900. Therefore, the lungs were ventilated manually using a T-piece circuit without improvement.

It was decided to attempt to improve oxygenation by using nitric oxide. This was introduced into the breathing system as close to the patient as possible by means of a 21-G needle attached to green plastic tubing, the needle piercing the swivel connector. Nitric oxide administration was started at a concentration of 20 ppm calculated by delivery of 100 ml/min of 1:1,000 nitric oxide in nitrogen into a fresh gas flow of 5 l/min of oxygen.  $Sp_{O_2}$  increased rapidly, reaching 90% within 1 min, suggesting a reversal of the shunt caused by transitional circulation.<sup>1-3</sup> After 5 min, the nitric oxide was decreased to 10 ppm and soon was discontinued. The  $Sp_{O_2}$  remained at 100%. The  $Fi_{O_2}$  was reduced to 0.5, and the  $Sp_{O_2}$  stayed at about 92-95%. Arterial blood pressure decreased slightly to around 28/18 mmHg shortly after introduction of nitric oxide and stayed at that level for the rest of the procedure.<sup>4</sup> This use of nitric oxide dramatically improved oxygenation in a moribund neonate. Although the absence of a nitric oxide and nitrogen dioxide analyzer could be criticized, it was thought that, because this was a potentially life-saving emergency situation, the use of nitric oxide in the absence of such analyzers

could be justified. However, because of the varying concentration of end-tidal nitric oxide with changes in ventilatory pattern and lung compliance, the use of such analyzers is mandatory in most circumstances to avoid toxicity and potential morbidity and mortality.

Use of nitric oxide in the operating room is feasible and should be considered in a neonate who reverts to transitional circulation.

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