Letters to the Editor

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Postnatal Steroids in Non-ventilated Preterm infants

Bronchopulmonary dysplasia (BPD) is a disease of infants born prematurely. The incidence is inversely proportional to the gestation age. Basing on the severity and per the National Institute of Health (NIH) consensus, it is defined as mild, moderate, and severe. (1) The prevention and treatment of BPD remain a challenge. The variation in the management depends upon the three phenotypic disease components; moderate-severe parenchymal disease, pulmonary hypertension, or large airway disease. (2)

“The prevention and treatment of BPD remain a challenge. The variation in the management depends upon the three phenotypic disease components; moderate-severe parenchymal disease, pulmonary hypertension, or large airway disease. (2)”

Recently, Hansen et al. (3) described a guideline for the use of dexamethasone in the preterm infant ≤ 30 weeks at birth and ≤ 30 days of life with developing BPD by using the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) BPD estimate calculator. (4) They suggested using

dexamethasone for a BPD/ death score of $\geq 35\%$ on ventilated preterm infants. The question that remained unanswered is: what about the non-ventilated preterm infant ≤ 30 weeks at birth and ≤ 30 days of life with a probability of severe BPD and/or death of $\geq 35\%$?

With the advent of non-invasive ventilator strategies, preterm infants are extubated earlier. Nasal continuous positive airway pressure (NCPAP) is a useful method for providing respiratory support after extubation. Similarly, the use of nasal intermittent positive pressure ventilation (NIPPV) had been shown to reduce the incidence of extubation failure and the need for re-intubation. (5)

With the increased use of non-invasive ventilation, we would have a ‘high-risk group’ of non-intubated preterm infants ≤ 30 weeks at birth and ≤ 30 days of life that might have a probability of severe BPD and/or death of $\geq 35\%$. For example, based on the NICHD BPD estimate calculator, a preterm infant on NCPAP at 14-day of life, weighing 670 grams at birth, born at 24-week gestation, still has a 39.1 % probability of developing BPD and/or death combined as compared to the same infant on the ventilator (Figure). Using Hansen et al. (4) current study guidelines and cut-off of 35%, should we consider using a 7-10 days course of low-dose dexamethasone in this specific group of non-ventilated high-risk preterm infants?

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Figure

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Sincerely,

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Dear Dr. Manzar,

Bronchopulmonary Dysplasia (BPD) has been fought with issues since the term was first described in preterm babies born at 28 weeks gestation or greater with chronic lung disease (CLD). (1) Although first used to describe CLD that was primarily a result of an increased interest in ventilating a population whose physiology was neither wholly understood nor compatible with the ventilators of the day, BPD developed into a term that was used to describe a clinical oxygen requirement and not a distinctive lung pathology. (1) These "so-called" oxygen challenge tests are appropriate in determining whether oxygen is indeed required but do little to define the actual lung disease that qualified the oxygen requirement in the first place. Moreover, with increased attention towards oxygen saturation targeting, one must remember that even conventional pulse oximetry did not exist when BPD was first defined. (2)

Decadron is another issue. Certainly, Decadron, a potent glucocorticoid, is a leading choice to prevent brain edema brought on

by neurological trauma in older patients. It provides enhanced access across the blood-brain barrier when compared to other steroids and is particularly effective in preventing the ramifications of brain swelling and subsequent herniation. However, a frequent aspect of treatment 25 years ago, Decadron use all but disappeared because of the negative consequences associated with the "scorched earth" doses commonly used during that era. Subsequently, BPD rates increased. Antenatal steroids improved the statistics considerably, but it is only comparatively recently that we have seen Decadron's resurgence, albeit at lower doses and shorter intervals. (3, 4)

"So at this point, we are using a potent therapeutic capable of crossing the blood-brain barrier to treat a disease with myriad etiologies based on a clinical perception now possible because of advances in monitoring that were not attainable when the disease was originally defined."

So at this point, we are using a potent therapeutic capable of crossing the blood-brain barrier to treat a disease with myriad etiologies based on a clinical perception now possible because of advances in monitoring that were not attainable when the disease was originally defined. Worse still, numerous benchmarks for good patient care have centered on BPD rates and the need for oxygen at discharge. These benchmarks are thought to be associated with improved clinical care and, thus, supposed better outcomes.

What was once a metric designed to highlight best of breed ventilator management is now clearly a tool that can be applied post-haste to redefine the care we provide. So while the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) BPD estimate calculator may provide guidance regarding the risk of development of BPD, (5) we must now go one step further. How can we possibly address whether the provision of nasal ventilation with oxygen presents more toxicity than the alternative, using a mode that was not even on the horizon when BPD was defined; pulse oximetry, developed; and Decadron, first prescribed to treat babies with chronic lung disease?

With increasing attention to resuscitating smaller babies than thought possible fifty years ago and using even more novel therapeutics, is it fair to still use the term BPD as a catch-all for chronic lung disease in a population we could not have even envisioned saving when the term was first defined? (6) Moreover, do we still see considerable "BPD" in the original index population? (1, 5)

While recent work from Harmon et al. suggests that the use of steroids in at-risk populations prior to day of life 50 will reduce the

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risk of "severe" BPD, (5) unfortunately, the more important answer is still a question. Why are we still using an archaic term to guide our treatment of a clinical entity related to the original disease in name only?

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Sincerely,

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