

Predictors of Mortality and Morbidity in Extremely Low Birth Weight Neonates

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In this issue of *Indian Pediatrics*, Mukhopadhyay and colleagues [1] report predictors of mortality and morbidity in extremely low birth weight infants (ELBW) in a single teaching hospital in India. In a prospective analysis of 255 ELBW, > 23 weeks gestation infants, 149 infants with a mean gestational age of 29 (± 2.6) weeks received intensive care. Infants were not offered intensive care due to limited resources, either because of lack of bed availability or inadequate parental finances. Their unit protocols included most of the newer evidenced-based therapies for this population, including early CPAP, rescue surfactant, and early trophic feedings [2,3].

The incidence of death or major morbidity in this cohort was high – almost half the babies provided intensive care died, and 39% suffered major morbidities, the majority of which were severe intraventricular hemorrhage. It is not clear from the report what the incidence of major morbidity was amongst the survivors, an important statistic to assess future resource utilization and social impact. Not surprisingly in the analysis, birth weight < 800 grams, shock and the need for mechanical ventilation predicted the risk of death. Birth weight < 800 grams, lack of antenatal steroids, asphyxia, and mechanical ventilation (all identified risk factors for intraventricular hemorrhage) predicted major morbidity. Of particular note, small for gestational age status, a fairly common finding in the cohort, was the most protective against death, with an odds ratio of 0.39 (95% CI: 0.19 – 0.75).

So, what are the lessons of this report? In quality improvement science, the old adage is “you can only manage what you measure”. Understanding local outcomes and risk factors for death or morbidity is essential for protocols to improve care in both resource rich and limited settings. While it is hard to know whether results from this academic center are generalizable to the larger Indian perspective, there do appear to be some more universal lessons. Only 22% of surviving infants were ≤ 28 weeks gestation, while representing over half of those who died. These results suggest that resources and clinical improvement efforts should be first devoted to larger, more mature infants in whom the likelihood of

mortality and major morbidity is much less. It is important for the clinician to recognize that, as shown by the data presented that the premature newborn < 28 weeks gestation who requires prolonged mechanical ventilation is likely not to survive. In contrast, the gestationally older baby who can be managed successfully on CPAP has a higher likelihood of a good outcome. What clinical improvements might influence better outcomes in these babies? Antenatally, programs to promote increased administration of antenatal glucocorticoids in a woman threatening to deliver preterm would likely have a large impact as has been shown in developed countries. The authors of the current report should be commended since almost three quarters of women whose babies were admitted to intensive care did receive steroids, though this proportion is likely to be much less outside of the academic setting. If possible, establishing structures and processes to shorten time to transfer to intensive care (10 hours in this study), may also improve outcomes. It is likely that many of the complications observed in this study (e.g. intraventricular hemorrhage, asphyxia) might be influenced by this long interval to intensive care via cold stress and delay in establishing adequate respiratory support. Alternatively, programs to train local personnel in basics of resuscitation, provision of warmth, and simple mechanisms to provide CPAP support to preterm infants in respiratory distress would be reasonable local goals [4,5]. Lastly, the incidence of sepsis was very high in this cohort. It is likely that this represents both early and late onset sepsis, for which there are established, low cost strategies for prevention [6]. As has been observed in NICUs in resource rich environments, attention to hand hygiene and umbilical and central line care can have a significant impact on NICU acquired infections [7].

Clinical quality improvement is a journey, not a destination. Understanding what we do, how we do it, and what our outcomes are is a start – the next phase is what we need to do to move the bar forward. This report is an excellent starting point.

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