Preterm neonatal survival: what is the role of prognostic models?

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Even before the 1960's and the introduction of the specialty of neonatology, and continuing to the present, numerous efforts have been made to understand the relationship between newborn birthweight and the risk of mortality. (1) With the development of neonatal intensive care units (NICUs), attention to survival rates and neurologic outcomes among those at the lowest birthweights and gestational ages (GA) has grown. (2) Defining the lower limits of GA or birthweight associated with the neonatal outcomes is important for clinicians, families, and others to inform appropriate decision-making and clinical care.

To predict newborn survival, numerous models have been developed to estimate risk at specific birthweights and/or GAs. To date, more than 35 have been published, almost exclusively from high-income countries with advanced NICU care. In a study published recently, van Beek et al sought to validate one of these predictive models from the United Kingdom (UK), deemed to be among the highest quality, with the objective of assessing its value for clinical use. (3)

Van Beek et al used an independent Dutch population to validate survival among very preterm infants using the UK model's parameters. Because they found relatively good performance, the authors' concluded that the model could inform daily clinical practice. However, the generalizability of their results, especially to other populations differing by ethnicity or socioeconomic status, is questionable. The parameters for the model quality focused on birthweight, GA, and gender, but many other metrics (including the racial diversity, quality of care, etc.) were limited. In particular, the interventions available and utilized for obstetric and neonatal care were not specified, which would be important for their goal of clinical use of the model. Importantly, the quality of obstetric care is not considered. (4) Both the availability and quality of specific obstetric and neonatal interventions in any given setting may be among the most important factors impacting survival.

Especially important for clinical considerations, long-term outcomes, including severe disabilities, were not addressed. Concerns about neurodevelopmental outcomes in infants at the lower limits of birthweight and GA are as or more important to parents and caregivers than survival. (5) It is thus unclear how this – or virtually any other model - can be useful for "daily clinical practice".

A better strategy to inform clinical care is for individual health-care facilities to maintain neonatal survival and neurological outcome statistics. These types of data within a specific context may be more helpful to physicians, including obstetricians and neonatologists, who often, together with parents and caregivers, make

decisions related to interventions prior to delivery or during NICU care. Newborn outcomes, especially at the extreme lower limits of birthweight and GA, remains an area of intense interest. While models may provide some supportive information, it is difficult to imagine that these will ever replace clinical decisions informed by actual outcome data from the specific facility.

Conflicts of interest: The authors declare no conflicts of interest.

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