

Analyses of risk factors that can be modified for improved neonatal outcome

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Abstract

Advances in neonatal medicine and medical technology have significantly improved the outcomes for premature or sick infants. The care provided is complex and requires a highly coordinated approach, which mandates huge resources, which are sometimes limited. Low and middle-income countries (LMICs) have therefore to determine the use of the resources wisely. This PhD analyzed risk factors for serious adverse outcomes in neonatal care to assess the magnitude of effects and possible intervention with the overall aim in mind, to help to pick priorities for the use of limited resources.

The first study investigated adverse pregnancy outcomes during the COVID-19 lockdown in a region with centralized neonatal health by a retrospective cohort study. Lockdown restrictions in Bihor County, Romania, were associated with an increase in stillbirths but the preterm birth rate remained unaffected. The second study analyzed adverse outcomes in extreme preterm infants fed with an exclusive human milk-based diet who receive human milk-based fortifiers when compared to infants fed bovine-milk fortifiers (meta-analysis). An exclusive human milk diet showed a mortality reduction of 50%. A meta-analysis of retinopathy and neurodevelopmental outcomes in preterm infants was performed to study the associations. The results support a causal relationship between ROP, anti-VEGF treatment, and poor neurodevelopmental outcomes. The last study evaluated milrinone use in persistent pulmonary hypertension, concluding that randomized controlled trials with milrinone as a monotherapy are needed in LMICs where inhaled nitric oxide (iNO)'s availability remains limited.

In conclusion, reducing negative outcomes in the neonatal population begins with safeguarding pregnant women, and acknowledging them as a vulnerable, special population subgroup. Secondly, promoting breastfeeding and an exclusive human milk diet with the help of milk banks positively influences both mortality and morbidity, which is the gold standard of neonatal care we nowadays practice. This, coupled with effective infection control measures and improved diagnostic capabilities of neonatologists, not only enhances the quality of neonatal care but also reduces the psychological impact, and decreases health-associated costs.