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Julia Tonnessen
Thomas Jefferson University

Pedro Urday, MD
Thomas Jefferson University

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Assessing the Temporality of Adverse Effects of Vaccines in the NICU

Julia Tonnessen, Pedro Urday, MD*

Introduction: Premature infants have an increased risk of contracting vaccine-preventable diseases and experience worse outcomes. Evidence supports keeping them on a regular vaccination schedule, but it is often delayed, partly because preterm infants have an increased incidence of cardiorespiratory events compared to term infants. The aim of our study was to determine if immunizations in the NICU contribute to an increased number of adverse events.

Methods: This was a retrospective, single-center, observational study with the target population infants born at less than 32 weeks gestation at Thomas Jefferson University Hospital who received the two-month vaccination series in the NICU. The primary outcome was the number of cardiorespiratory events (apnea, bradycardia, and desaturations) in the 72 hours before and after immunization. Main predictors were history of NEC, BPD, and IVH. Data was retrieved from Epic and analyzed using Generalized Estimating Equation (GEE) with Poisson link to compare incidence between pre- and post-immunization.

Results: 37 neonates met inclusion criteria. Incidence rate ratio (IRR) between pre-and post-immunization was 2.1 for desaturation (95% CI: 1.21-3.63; $p = 0.008$), 3.5 for bradycardia (95% CI: 0.97-12.58; $p = 0.05$), and 1.33 for apnea (95% CI: 0.26-6.94; $p = 0.732$).

Conclusion: The results support links between immunization and increased risk of desaturation and bradycardia but did not provide significant evidence to support a link with increased risk of

apnea. This indicates that neonates who experience frequent cardiorespiratory events should be closely monitored or have two-month immunizations delayed. Next steps include studying other centers to increase sample size.