September 21st, 2023 11:00 - 12:30

PARALLEL SESSION 16 - EPIDEMIOLOGY 2

ID 512. Trends of Infant Mortality due to Neonatal Encephalopathy and Birth Asphyxia (NE) in India, 1990-2019.

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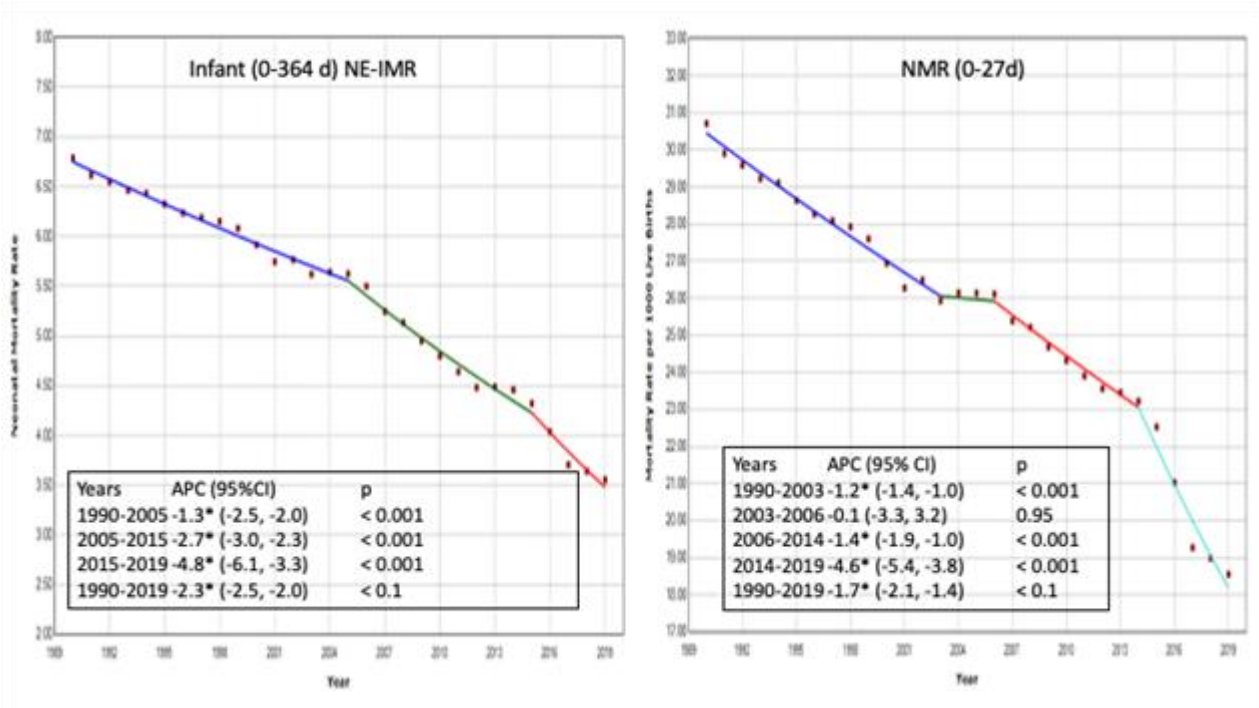
Background: Reducing infant and neonatal mortality is a crucial objective of the United Nations sustainable development goals (SDGs), particularly for low and middle–income countries. This study aims to analyze the trends in infant mortality rate (IMR), NE–related infant mortality rate (NE–IMR), and neonatal mortality rate (NMR) in India over the past three decades.

Methods: We utilized the Global Health Data Exchange tool to obtain data on annual NE–related death counts from 1990 to 2019, categorized by age (early: 0–6 days, late: 7–27 days, post–neonatal: >28 days–365 days) and location (https://ghdx.healthdata.org/). We extracted UN Population Prospects data for India's annual birth cohorts from 1990 to 2019. To summarize and model the data, we calculated and compared the overall NE–IMR trends using the Joinpoint regression program from the National Cancer Institute. Statistical significance was set at <.05. We assessed NE–related mortality using the human capital approach, value of statistical life (VSL), and value of statistical life year (VSLY) methods.

Results: Among more than 811 million births, 4.4 million (UI: 3.6, 5.3) deaths were attributed to NE. The relative contribution of NE to total infant mortality decreased from 22.1% in 1990 to 19.2% in 2019. Over the study period, NE–IMR and NMR decreased from 6.8 to 3.6 and 29.2 to 18.2 per 1000 live births, respectively. We

observed a 39.6% (UI: 33.2, 43.7) reduction in IMR from 1990 to 2019, while NE–IMR decreased by 47.6% (UI: 43.4, 51.3). The annual percentage change (APC) for NE–IMR and NMR was –2.3% (95% CI: –2.5, 2) and –1.7% (95% CI: –2.1, –1.4), respectively [Figure]. In 2019, there was substantial interstate variation in NE–IMR [see Figure 3]. The economic losses associated with NE–related infant mortality ranged from 25–51 billion USD.

Conclusions: In India, there has been remarkable progress in reducing NE–related mortality compared to the overall reduction in neonatal mortality over the past 30 years. As NMR serves as a crucial indicator for social development and economic progress, targeted investments are necessary to sustain this progress by expanding coverage and addressing data gaps. These efforts are crucial for achieving the SDG target of single–digit NMR by 2030.



Trends in NE–IMR (left) and NMR (Right). We noted three joinpoints for NE–IMR and four joinpoints for NMR.

Trends in NE–IMR (left) and NMR (Right). We noted three joinpoints for NE–IMR and four joinpoints for NMR.

None declared

ID 212. Association between umbilical cord pH levels and neonatal morbidity and mortality: A national cohort study of 338 720 children from Denmark.

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Background

Umbilical cord pH (UC-pH) is an important indicator of neonatal well-being, but threshold values for increased risk of morbidity and mortality are unclear. In the clinical setting, a UC-pH < 7.00 is often used as a threshold for pathology, but this may not capture all children at risk. This study aimed to investigate the proportion of

children with neonatal complications among those born with UC–pH between 6.00 and 7.50 in a national setting with universal UC–pH measuring.

Methods

This population–based cohort study included live–born singleton term infants born in Denmark from 2012 to 2018. Infants with known malformations of the heart, lungs, or nervous system were excluded. Data on UC–pH, neonatal morbidities and survival were obtained from the national patient register and linked to the civil registration number of the newborn infant. We divided the infants into 4 groups according to UC–pH levels (<7.00, 7.00–7.09, 7.10–7.19 and 7.20–7.40 as the reference). Multiple imputations were performed for missing UC–pH values (5.9%). We used Poisson regression models and estimated the relative risk ratios with 95% confidence intervals (CI) for morbidities and mortality in the first 28 days after birth.

Results

A total of 338 720 live–born children were included in the study. The proportions of infants with low Apgar scores, respiratory complications, hypoglycemia, and neurological complications were significantly increased if UC–pH was below 7.20 compared to > 7.20 (Table 1). However, there was a steep decline in risk ratios for complication from UC–pH < 7.00 to 7.20. The risk of neonatal death was increased if UC–pH was <7.10, and there was a tenfold increase in neonatal death if UC–pH was below 7.00 compared to 7.00–7.09.

Conclusion

This large observational study shows that a threshold of UC–pH <7.00 is associated with the markedly highest risk of death and morbidities compared to higher UC–pH values. However, the rates of other severe neonatal morbidities were also increased at UC–pH values between 7.00 to 7.19 and neonatal mortality was increased if UC–

pH was below 7.10. These findings may have important implications for clinical decision–making and the management of neonatal care.

Table 1. Outcomes according to UC-pH. Values are numbers (percentages) unless otherwise stated.

	pH <7.00 (n=3510) n (%)	pH 7.00-7.09 (n= 11 920) n (%)	pH 7.10- 7.19 (n=72 531) n (%)	pH 7.20-7.50 (n= 250 741) n (%)	pH <7.00 compared to 7.20-7.40 RR (95% CI)	pH 7.00-7.09 compared to 7.20-7.40 RR (95% CI)	pH 7.10-7.19 compared to 7.20-7.40 RR (95% CI)
Apgar 0-3/5	103 (2.9)	67 (0.6)	128 (0.2)	222 (0.1)	33.1 (26.3-41.8)	6.4 (4.8-8.3)	2.0 (1.6-2.5)
Apgar 0-6/5	298 (8.5)	324 (2.7)	524 (0.7)	805 (0.3)	26.4 (23.3-30.1)	8.5 (7.5-9.6)	2.3 (2.0–2.5)
CPAP	838 (23.9)	2978 (16.6)	4299 (5.9)	7712 (3.1)	7.8 (7.2-8.2)	5.4 (5.2-5.7)	1.93 (1.9-2.0)
Mechanical ventilation	84 (2.4)	59 (0.5)	134 (0.2)	349 (0.1)	17.2 (13.6-21.8)	3.56 (2.7-4.7)	1.3 (1.1-1.2)
Meconium aspiration	81 (2.3)	151 (1.3)	360 (0.5)	638 (0.3)	9.1 (7.2-11.4)	5.0 (4.2-5.9)	1.95 (1.71-2.22)
iNO	16 (0.5)	13 (0.1)	26 (0.0)	44 (0.0)	26.0 (14.8-46.0)	6.2 (3.4-11.5)	2.0 (1.3-3.3)
Hypoglycemia	481 (13.7)	2407 (20.2)	4876 (6.7)	9870 (3.9)	3.5 (3.2-3.8)	5.1 (4.9-5.3)	1.7 (1.7-1.8)
Convulsions	65 (1.9)	42 (0.4)	142 (0.2)	289 (0.1)	16.1 (12.3-21.0)	3.1 (2.2-4.2)	1.70 (1.39-2.08)
Hypothermia treatment	114 (3.3)	28 (0.2)	38 (0.1)	44 (0.0)	>100	13.4 (8.3-21.5)	3.0 (1.9-4.6)
Neonatal death (0-28 days)	35 (1.0)	11 (0.1)	14 (0.0)	55 (0.0)	40.0 (26.2-60.8)	4.21 (2.20-8.04)	0.9 (0.5-1.6)
Composite neonatal outcome*	186 (5.3)	106 (0.9)	275 (0.4)	622 (0.3)	20.1 (17.1-23.5)	3.4 (2.8-4.1)	1.4 (1.3-1.7)

CPAP= Continuous Positive Airway Pressure; iNO = treatment with inhaled Nitric oxide.

*Composite neonatal outcome: Neonatal death (0–28 days), hypothermia treatment, mechanical ventilation, iNO treatment, or convulsions.

The authors have no conflict of interest