

Maternal and infant morbidity and mortality in extremely premature infants - a single centered study in Detroit, Michigan between 23-26 weeks of gestation

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Abstract

PURPOSE: The limits of viability and care of extremely premature infants continue to expand in developed countries, but delivery of extremely premature infants still poses significant risk of infant morbidity and mortality. Many participants in the care of extremely preterm gestations perceive that cesarean birth improves neonatal outcomes. This study compares neonatal outcomes with route of delivery across this precarious gestational age range. The study similarly compares maternal outcomes for this population.

METHODS: A retrospective cohort study was performed using data from EPIC Electronic Medical Record at HFH. The study was approved by the Institutional Review Board of HFH on October 27th, 2021 (IRB #15191). Study subjects included live births between 23 weeks and 0 days and 26 weeks and 6 days of gestation. Data analysis was done using SAS 9.4 software; statistical significance was set at $p < 0.05$ and all tests were two sided.

RESULTS: Among the 253 infants identified, the most common indications for maternal admission were preterm labor (34.8%), ruptured membranes (26.1%), maternal indications (14.6%), and vaginal bleeding (13.8%). Two hundred nine patients (82.3%) received fetal intervention, and 237 (96%) received neonatal resuscitation. Overall neonatal mortality was 17.5% (n=43). Neonatal mortality decreased with increasing gestational age: 37.2% (n=16), 24.0% (n=12), 15.5% (n=11), and 4.9% (n=4) at 23, 24, 25, and 26 weeks of gestation, respectively ($p < 0.001$). Overall neonatal morbidity (composite score of intraventricular hemorrhage, necrotizing enterocolitis, oxygen requirement on discharge) was 63.8% (n=134). Neonatal morbidity decreased with increasing gestational age: 93.3% (n=28), 82.1% (n=32), 55.6% (n=35), and 5.0% (n=39) at 23, 24, 25, and 26 weeks of gestation, respectively ($p < 0.001$). Overall maternal morbidity (composite score of endometritis, blood transfusion, ICU admission, surgical site infection, venous thrombosis) was 18.1% (n=46) and was not different among the various gestational age groups. Cesarean section was performed for 169 (66.9%) patients, 57 (33.7%) due to fetal malpresentation. Overall maternal morbidity was significantly higher among women with cesarean delivery (23.2%, n=38) compared to vaginal (9.9%, n=8) ($p = 0.012$). Overall neonatal mortality was 19.8% (n=16) among vaginal deliveries compared to 15.9% (n=26) of cesarean deliveries ($p = 0.446$); infant morbidity among surviving infants was 48.1% (n=39) among vaginal deliveries compared to 57.9% (n=95) of cesarean deliveries ($p = 0.148$). Overall morbidity and mortality did

not differ by indication of delivery in general, or indication of cesarean delivery in specific ($p>0.05$).

CONCLUSION: For extremely premature deliveries between 23 and 26 weeks gestation, cesarean section did not improve neonatal morbidity and mortality and is associated with increased maternal morbidity. Route of delivery in the periviable gestational age range requires careful consideration.