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Integrated neonatal support on placental circulation with resuscitation (INSPIRe): A feasibility study

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Background: It is recommended to delay umbilical cord clamping for at least 60 seconds in preterm infants to facilitate placental transfusion (PT). However, compromised neonates receive immediate cord clamping as they are deemed to require resuscitation. These babies may benefit from both PT and resuscitation; this dyad is not well studied.

Objective: To study the feasibility of initiating resuscitative support during PT for up to 90 seconds in preterm infants.

Design/Methods: We designed and built a mobile battery-powered resuscitation platform (INSPIRe) that contains a warm gel mattress, oxygen and air tanks, oxygen blender, T-piece resuscitator, pulse oximeter (PO), and electrical suction device. Resuscitative care included positioning neonate in a supine position, opening the airway, suctioning if necessary, drying, and stimulation. Thermoregulation was maintained using a hat, warm blankets and gel mattress. Respiratory support was initiated at 30 seconds following Neonatal Resuscitation Program guidelines. Preductal oxygen saturation (SpO₂) was continuously monitored.

Heart rate was documented via auscultation at 30, 60 and 90 seconds. Umbilical cord clamping was done at 90 seconds. The baby and the platform were mobilized from mother's bedside to the radiant warmer in the same room by one provider, while another provider maintained the respiratory support. Axillary temperature was obtained, once the baby is transferred to the radiant warmer. Resuscitation interventions and management during first 24 hours were documented.

Results: Fourteen preterm infants (26–36 weeks) born vaginally received resuscitative care using INSPIRe during PT for 90 seconds. Eleven neonates received CPAP on INSPIRe, two received PPV. Eleven infants received ongoing cpap in the NICU. Preductal SpO₂ was >70% at one minute of age and no less than 78% at 90 seconds. One neonate had a temperature <36.5 (35.9). No neonate required inotropes or fluid volume resuscitation in the following 24 hours. None of them had IVH.

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