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Implementing intact cord resuscitation in very preterm infants: feasibility and pitfalls
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Abstract
The purpose of this study is to evaluate the feasibility of intact cord resuscitation (ICR) in very preterm infants using a custom-equipped mobile resuscitation trolley (LifeStart®). We collected maternal and neonatal data of all inborn infants < 32 weeks eligible for ICR per our protocol over 9 months from ICR implementation. We compared rates of ICR between the beginning and the end of the study period. We reviewed maternal and neonatal adverse events related to the procedure and direct outcomes. In order to assess potential quality improvements related to the procedure, we collected the same data in the infants born in the 9-month period preceding ICR implementation. Out of 44 infants born < 32 weeks during the period, 27 were eligible for ICR. Failure to initiate ICR occurred in 9/27, exclusively in the first 5.5 months of the study. In one infant, ICR was interrupted prior to 2 min due to placental abruption. No ICR procedure had to be interrupted due to insufficient cord length. Among the 18 infants who completed ICR, cord clamping timing increased significantly over the study period, from 3.0 [2.5–3.5] to 4.2 min [3.1–8.3] (p = 0.02). No significant maternal blood loss or wound complications were noted. No infant deaths were attributable to failure or direct consequence of ICR, and no infant experienced hypoxic respiratory failure (intubation, FiO2 ≥ 0.4), asphyxia (pH < 7.2), or blood pressure instability (< 2 SD) following stabilization. Hemoglobin level after cord clamping was higher in the ICR cohort than in the pre-implementation group. Seven out of 18 infants exposed to ICR had a temperature < 36.5 °C on admission. Conclusion: ICR is feasible in very preterm infants. Temperature management requires special attention. Multidisciplinary simulation training before implementation and systematic post-implementation quality improvement meetings may significantly increase ICR program success.What is Known:• Because infants born < 32 weeks often require cardiorespiratory resuscitation at birth, they are not offered delayed cord clamping in the majority of neonatal intensive care units.• Recently, fully equipped mobile trolleys have been developed in order to allow bedside resuscitation with an intact cord.What is New:• Variable timing of cord clamping based on the infant's transition and respiratory stability, i.e., "physiology-based cord clamping," is safely achievable in very preterm infants.• Intact cord resuscitation requires specific equipment, operational protocols, and a high level of preparation from both obstetrical and neonatal teams, with a learning curve that can be streamlined by multidisciplinary simulation training. © 2022, The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature.

Author Keywords
Delayed cord clamping; Intact cord resuscitation; Resuscitation trolley; Very preterm infants

Index Keywords
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clamping, ligation, placenta, pregnancy, procedures, resuscitation, umbilical cord; Constriction, Feasibility Studies, Female, Humans, Infant, Newborn, Infant, Premature, Infant, Premature, Diseases, Placenta, Pregnancy, Resuscitation, Umbilical Cord

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