

Effects of Delayed Umbilical Cord Clamping vs. Immediate Cord Clamping on Neonatal Outcomes

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PICO Question

In neonates, does use of delayed umbilical cord clamping (DCC) compared to early umbilical cord clamping (ECC) result in improved neonatal outcomes?

Population: Neonates

Intervention: Use of DCC (>30 seconds)

Comparison: Neonates treated with early or immediate cord clamping

Outcome: Improved outcomes for neonates who received DCC

Background

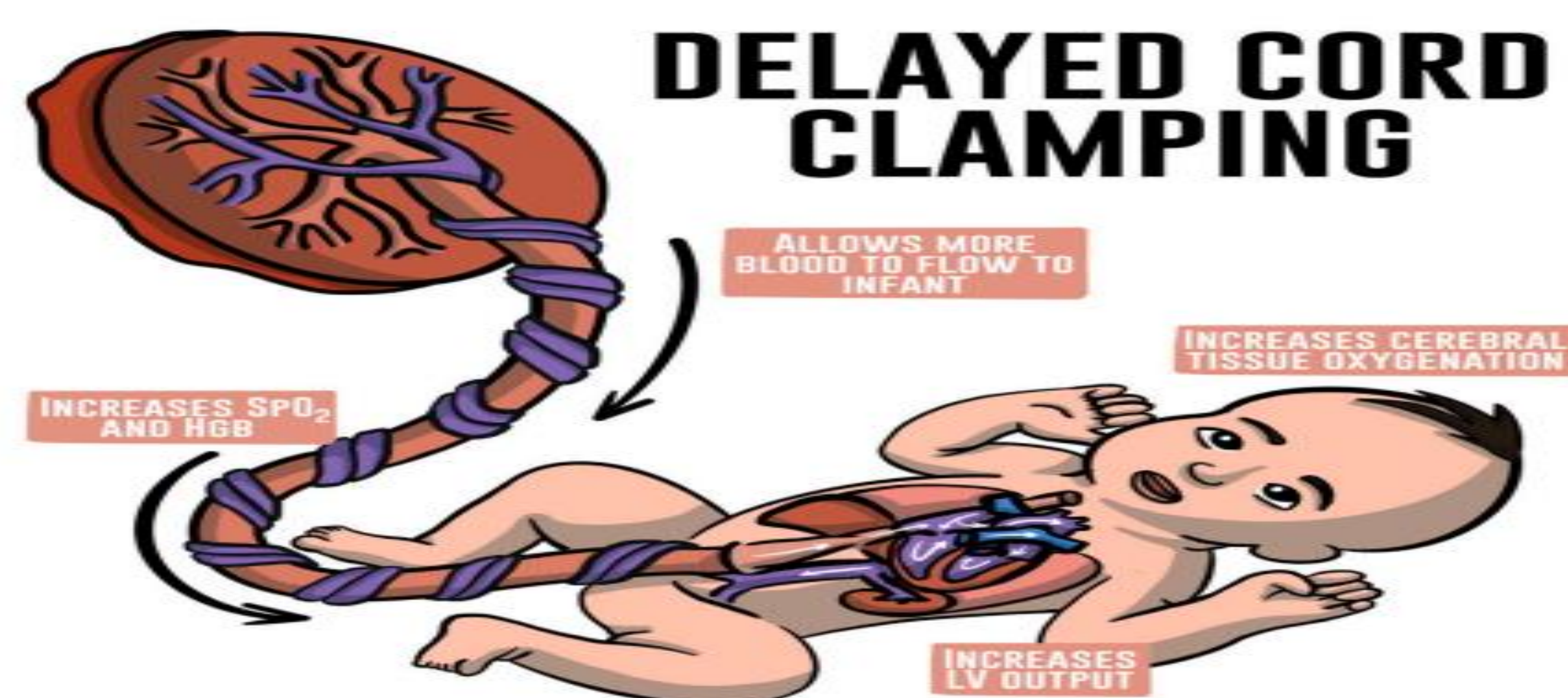
- Historically, immediately clamping the umbilical cord clamping was common due to the belief it prevented postpartum hemorrhage
- More recent research suggests that DCC allows for placental transfusion to deliver an estimated additional 80-100 mL of blood to the neonate over 3 minutes, which may lend a plethora of benefits to the neonate's outcome (American College of Obstetricians and Gynecologists' Committee on Obstetric Practice, 2020)

Significance

- Zero cost intervention
- Improves neonatal iron levels, immune function, and H&H (Akyildiz & Askoy, 2022)
- Recommended by American College of Nurse-Midwives, WHO, and the American Academy of Pediatrics, but with inconsistent recommendations for timing (2-5 min, >60 sec., & 30-60 sec. respectively)
- May have other substantial benefits to term and preterm, and SGA neonatal outcomes

Literature Review

- DCC for >60 sec. was negatively associated with low APGAR scores, low oxygen saturation, NICU admission, and respiratory distress in term, normal birth weight neonates [$p=0.034$, $p=0.016$, $p=0.029$, $p=0.039$ (Mina et al., 2023)].
- DCC for >30 sec. was negatively associated with mortality, low APGAR scores, and need for blood transfusion with no difference in serum bilirubin levels compared to ECC in SGA neonates born <33 weeks [$p<.01$, $p<.01$, $p<.01$, $p=.16$ (Brown et al., 2022)].
- DCC for >60 sec. was positively associated with higher HCT levels 24h after birth for term neonates compared to ICC. No differences were detected for rates of mortality or adverse maternal outcomes (Chen et al., 2018).
- DCC was negatively associated with all-cause mortality in neonates born at <28 weeks and the need for blood transfusions for neonates born at <37 weeks. However, it was positively associated with polycythemia for neonates <37 weeks compared to ECC (Fogarty et al., 2018).
- DCC for ≥ 180 seconds for neonates born at <33 weeks was associated with higher oxygen saturation values throughout the first 10 minutes after birth and lower heart rates throughout the first 5 minutes after birth [$p<.001$, $p<.001$ (Ashish et al., 2019)].



Results

- For term neonates: DCC for >60 sec. was associated with benefits including higher APGAR scores, higher oxygen saturation scores, fewer incidences of NICU admission, fewer incidences of respiratory distress, and higher HCT levels 24h after birth (Chen et al., 2018; Mina et al., 2023; Ashish et al., 2019).
- For neonates born at <37 weeks: One study found that DCC for ≥ 60 seconds was associated with fewer incidences of blood transfusions, but also polycythemia (Fogarty et al., 2018).
- For preterm neonates born <33 weeks: DCC for >30 sec. was associated with benefits including fewer incidences of mortality, higher APGAR scores, and fewer incidence of blood transfusion. DCC for ≥ 180 sec was also associated with higher oxygen saturation levels (Brown et al., 2022, .
- For preterm neonates born <28 weeks, DCC for ≥ 60 sec. was associated with lower all-cause mortality (Fogarty et al., 2018).

Implications for Nursing Practice

Nursing Practice

- According to the American College of Obstetricians and Gynecologists, the best practice is to delay cord clamping for 30-60s after birth (Mascola et al., 2020).
- Best nursing practice recommendations regarding DCC vary. However, recent research suggests that DCC may have benefits, such as improving neonatal iron stores, reducing the risk of intraventricular hemorrhage, and decreasing the need for blood transfusions in preterm infants (Aithal et al., 2023).
- The practice of DCC aligns with the QSEN competencies, it helps minimize risks posed to infants and proven little risk to mothers. The safety QSEN competency and nursing practice emphasize the importance of nurses needing to maintain awareness of best/current practices related to umbilical cord clamping.

Nursing Education

- Education related to umbilical cord clamping should be initiated upon hire and orientation to the unit and regularly reinforced throughout practice.
- Nurses level of involvement and responsibilities in the deliveries and care of infants during and after delivery requires their competency to be held to a high standard, and accurate nursing education should reflect that.

Future Nursing Research

- To establish best practice protocols for DCC, studies need to be aligned with evidence-based practice and present trustworthy data. Research needs to be conducted on a larger scale, peer-reviewed and include a multitude of potential variables, evaluating factors such as hematologic status, respiratory status and psycho-neuro development.
- Expanding research towards optimal timing, cord milking and other methods in practice and compared to DCC will further research and pose potential beneficial neonatal outcomes (Fogarty et al., 2018).
- There are only benefits to expanding research into DCC, and furthering clinical and professional research maintains current, and strong evidence to continue implementation into practice.