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[Intervention Review]

Effect of timing of umbilical cord clamping and other strategies to influence placental transfusion at preterm birth on maternal and infant outcomes

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ABSTRACT

Background

Optimal timing for clamping the umbilical cord at preterm birth is unclear. Early clamping allows for immediate transfer of the infant to the neonatologist. Delaying clamping allows blood flow between the placenta, the umbilical cord and the baby to continue. The blood which transfers to the baby between birth and cord clamping is called placental transfusion. Placental transfusion may improve circulating volume at birth, which may in turn improve outcome for preterm infants.

Objectives

To assess the short- and long-term effects of early rather than delaying clamping or milking of the umbilical cord for infants born at less than 37 completed weeks' gestation, and their mothers.

Search methods

We searched the Cochrane Pregnancy and Childbirth Group Trials Register (31 May 2011). We updated this search on 26 June 2012 and added the results to the awaiting classification section.

Selection criteria

Randomised controlled trials comparing early with delayed clamping of the umbilical cord and other strategies to influence placental transfusion for births before 37 completed weeks' gestation.

Data collection and analysis

Three review authors assessed eligibility and trial quality.

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Main results

Fifteen studies (738 infants) were eligible for inclusion. Participants were between 24 and 36 weeks' gestation at birth. The maximum delay in cord clamping was 180 seconds. Delaying cord clamping was associated with fewer infants requiring transfusions for anaemia (seven trials, 392 infants; risk ratio (RR) 0.61, 95% confidence interval (CI) 0.46 to 0.81), less intraventricular haemorrhage (ultrasound diagnosis all grades) 10 trials, 539 infants (RR 0.59, 95% CI 0.41 to 0.85) and lower risk for necrotising enterocolitis (five trials, 241 infants, RR 0.62, 95% CI 0.43 to 0.90) compared with immediate clamping. However, the peak bilirubin concentration was higher for infants allocated to delayed cord clamping compared with immediate clamping (seven trials, 320 infants, mean difference 15.01 mmol/L, 95% CI 5.62 to 24.40). For most other outcomes (including the primary outcomes infant death, severe (grade three to four) intraventricular haemorrhage and periventricular leukomalacia) there were no clear differences identified between groups; but for many there was incomplete reporting and wide CIs. Outcome after discharge from hospital was reported for one small study; there were no significant differences between the groups in mean Bayley II scores at age seven months (corrected for gestation at birth (58 children)).

No studies reported outcomes for the women.

Authors' conclusions

Providing additional placental blood to the preterm baby by either delaying cord clamping for 30 to 120 seconds, rather than early clamping, seems to be associated with less need for transfusion, better circulatory stability, less intraventricular haemorrhage (all grades) and lower risk for necrotising enterocolitis. However, there were insufficient data for reliable conclusions about the comparative effects on any of the primary outcomes for this review.

PLAIN LANGUAGE SUMMARY

Early cord clamping versus delayed cord clamping or cord milking for preterm babies

In the womb, the baby's blood flows through the umbilical cord to and from the baby and the placenta bringing oxygen and nutrition to the baby from the mother's blood. If the umbilical cord is left unclamped for a short time after the birth, some of the blood from the placenta passes to the baby (this is called placental transfusion) to increase the baby's blood volume and help the flow of blood to the baby's important organs including the lungs. For many years now, standard care during the delivery of the placenta has been to clamp the cord immediately at birth. This review looks at delaying cord clamping to allow more placental transfusion compared with immediate cord clamping. The other intervention considered is "milking the cord" which means the caregiver holds the cord and squeezes blood down the cord into the baby. In this review we have included 15 randomised controlled trials with 738 babies born prematurely between 24 and 36 weeks' gestation by caesarean section or vaginal birth. These studies compared babies where the cord was clamped within a few seconds of the birth with those whose cords were clamped after a delay of at least 30 seconds. The maximum delay in cord clamping was 180 seconds. Providing babies with additional blood through delayed cord clamping or milking the cord before clamping appeared to help the babies to adjust to their new surroundings. Fewer babies needed transfusions for anaemia, the risk of bleeding in the brain (intraventricular haemorrhage) and the risk of necrotising enterocolitis (a severe infection in the bowel) were reduced. The trials had an unclear risk of bias and varied outcome definitions were used. Further studies are needed comparing methods of delivering placental blood to babies to see which has the most benefit.