

Introduction

By 2030 the global Caesarean Birth (CB) rate is projected to be nearing 30% with 38 million CB being performed worldwide per annum.¹

Transient tachypnea of the newborn (TTN) is a significant risk associated with caesarean birth. The risk of neonatal respiratory morbidity is increased by 95% in neonates delivered by planned caesarean compared to vaginal birth.²

Intervention

A Time-to-Transition Caesarean Birth’ (TTT) during which the birth of the baby from the uterus is slowed with the intention of providing the baby with more time to transition from in-utero to ex-utero life. The caesarean is conducted as per routine practice until the birth of the baby’s head.

Once the baby’s head is delivered from the uterine cavity onto the maternal abdomen, the body of the baby is left inside the uterus to allow the baby to commence spontaneous respiration whilst remaining attached to the placental circulation. The body is delivered 30 seconds after the first cry (approximately 20 neonatal breaths) or at 120 seconds, whichever is sooner.

The birth is expedited and the intervention ceased if any concerns arise.

Objective

To investigate the feasibility, safety and acceptability of performing a ‘Time-to-Transition Caesarean Birth’.

Design

Single-centre, observational feasibility study at North Bristol Trust, UK.

Methods

Inclusion criteria: Planned caesarean birth with a singleton, cephalic presentation between 37+0 and 42+0 weeks

Recruitment: After a decision had been made for a planned caesarean and prior to admission

Intervention: “Time-to-Transition” caesarean birth

Primary outcome: Intervention adherence

Secondary outcomes: safety, acceptability (patient, partner and staff reported outcomes)

Sample size: 34 TTT caesarean births to give 90% power (with one-sided 5% alpha) to detect if adherence to the intervention was below 50% (unacceptable adherence), or above 75% (acceptable adherence).

Video analysis: All births were video recorded using camera mounted on the primary surgeon's head and a tripod mounted camera at the foot of the operating table. Videos were independently reviewed by two obstetricians who had not participated in the study.

Patient and birth partner perception: All women and their birth partners were asked to complete a survey on day 1 and day 28 postnatal about their experience of a TTT birth

Surgeon, midwife, scrub nurse and anaesthetist perception: Staff were asked their perception of the procedure immediately following each case.



Time-to-transition Caesarean birth

- Head delivered
- Carbetocin given with delivery of baby’s shoulder
- Baby’s head dried with surgical towel
- Delivery completed
 - 30 seconds after first cry
 - 120 seconds after the head was delivered if no cry

Results

Maternal demographics: 34 women had a TTT caesarean birth. Eight (24%) were nulliparous and seven (21%) had gestational diabetes. No women smoked during pregnancy, and none had received antenatal steroids. The median maternal BMI at booking was 22.9 (range 22.1 to 56.6).

TTT Caesarean details: The 34 TTT caesareans were performed by seven obstetricians. The median time between the delivery of the head and the body was 55s (range 33 to 139). The median time from delivery of the head to first cry was 12s (range 1 to 187). Median time from cry to birth was 44s (range 17 to 67) in 32 cases, with two babies not crying before birth.

The **intervention adherence** was 91% with the intervention being completed correctly in 31 of the 34 cases. The intervention was not adhered to in three cases: two babies were delivered before 30 seconds from their first cry and one baby was delivered prior to their first cry but before 120 seconds had elapsed from the delivery of the baby’s head.

Maternal outcomes: The median measured blood loss at TTT caesarean was 330mLs (range 116 – 812).

Neonatal outcomes: Median birthweight was 3436 g (range 2740 to 5065). Apgar scores at five minutes were: 8 in one baby (3%), 9 in two babies (6%) and 10 in 31 (91%) babies. 33 (97%) babies had cord blood gases taken: median arterial and venous pH were 7.297 (range 7.160 to 7.363) and 7.365 (range 7.198 to 7.463) respectively. Median haemoglobin concentration in the umbilical artery was 160g/L (range 121 to 190). Median neonatal temperature at five minutes of age was 36.9°C (range 36.2 to 37.5). No babies required respiratory support.

Conclusion

“Time-to-Transition Caesarean Birth” is feasible to perform, with intervention adherence in 91% cases. There were no safety concerns, and the intervention was well-received by women, their birthing partners and the surgical team.

A multi-centred RCT to evaluate whether TTT caesarean births are associated with improved neonatal outcome is now planned.

References:

1. Betran AP, Ye J, Moller AB, Souza JP, Zhang J. Trends and projections of caesarean section rates: global and regional estimates. *BMJ Glob Health.* 2021;6(6).
2. Tefera M, Assefa N, Mengistie B, Abrham A, Teji K, Worku T. Elective Cesarean Section on Term Pregnancies Has a High Risk for Neonatal Respiratory Morbidity in Developed Countries: A Systematic Review and Meta-Analysis. *Front Pediatr.* 2020;8:286