Reaudit of maternal temperature at elective caesarean section

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Introduction

- The benefits of maintaining normothermia in the perioperative period include reductions in wound infections, coagulopathy, blood loss, and transfusion.
- Women undergoing elective lower segment caesarean section (LSCS) are prone to hypothermia due to neuraxial blockade, intravenous (IV) fluids and exposure.
- NICE guidelines recommend warm IV fluids using a fluid warming device, warm irrigation fluids and consideration of forced air warming for patients who shiver, feel cold or have a temperature < 36^0C during caesarean birth.
- An initial audit in 2016 (North Bristol NBT) reviewed 80 women undergoing elective LSCS for evidence of hypothermia during the perioperative period. Strategies to maintain normothermia at that time included pre-operative dressing gowns, resistive warming mattresses and pre-warmed IV fluids. Incidence of hypothermia in this group was found to be 20%.

Methods

- Following on from the 2016 audit a new perioperative warming strategy (intra-operative active IV fluid warming (Ranger^{TM}); incorporation of final temperature monitoring into recovery discharge checklist; staff education for managing hypothermia and use of pre-warmed blankets around the mother's shoulders in recovery) was introduced.
- Data was collected on temperature pre-operatively, at the end of surgery (immediately on entering recovery) and on leaving recovery. Data was also collected on the volume of IV fluid given and estimated blood loss.
- Temperature was recorded using a tympanic infra-red thermometer. Hypothermia was defined as a temperature < 36^0C
- Data was entered by the anaesthetist and midwife caring for the mother via a QR code link to a questionnaire. Missing data was collected retrospectively by the authors using case note review.
- Power was calculated at 80%. Comparison between groups was made using a χ^2test, significance was set at $p<0.05$

Results

- Incidence of hypothermia in the 2016 audit was: 6 women (7.5%) pre-op, 15 (18.8%) intra-op and 1 (1.3%) in recovery. Overall hypothermia rate was 25% (20/80).
- After changes were embedded within the elective LSCS pathway 2021 audit hypothermia rates were 0 in pre-op, 3 women (7.5%) intra-op and 0% in recovery.
- The p-value was significant comparing 2016/2021 data using a χ^2test. The contingency data is shown in table 1 (χ^2 1, N=120) = 5.27, p = 0.02).
- There was no statistical difference in temperature when comparing IV fluid volume or blood loss.

	2016	2021	Total
Hypothermia (<36^0C)	20 (15.5) [1.42]	3 (7.67) [2.84]	23
Normothermia (≥36^0C)	60 (64.67) [0.34]	37 (32.33) [0.67]	97
	80	40	120

Table 1: Contingency table comparing rates of hypothermia in elective LSCS in 2016 and 2021.
Key: (Expected cell totals) and [χ^2 statistic for each cell]

Discussion

Implementing the NICE recommendations for active fluid warming at caesarean section with staff education and locally driven ideas (the warmed sheet and blanket) have significantly reduced the rate of peri-operative hypothermia in elective LSCS.

References

1. National institute for health and care excellence. Caesarean birth. NICE Guideline No. 192 2021. https://www.nice.org.uk/guidance/ng192.
2. P Sultan, A Habib, Y Cho et al. The effect of patient warming during Caesarean delivery on maternal and neonatal outcomes: a meta-analysis. British Journal of Anaesthesia 2015 115: 500-10.