Intrapartum fetal blood sampling performed at early cervical dilatation and delivery outcomes

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Introduction

A fetal scalp lactate, used in 5% of intrapartum women is used as a diagnostic test of fetal wellbeing when there are abnormalities on continuous cardiotocography monitoring (CTG) and is recommended by Royal Australian and New Zealand College of Obstetricians and Gynaecologists (RANZCOG) Guidelines (1).

The fetal scalp lactate increases spontaneous vaginal delivery rates as it provides precise information regarding the wellbeing of the fetus and so the mother can continue in labour (2).

However, there are concerns that the benefits of the invasive test are minimal and don't justify the potential complications (4), such as cerebrospinal fluid leakage, haemorrhage and sepsis (4) On average, 37 minutes are required to achieve delivery from the time a decision to perform fetal blood sampling is made (4).

Labour requiring fetal blood sampling (FBS) for CTG changes at an early stage are presumed to increased risk of repeat lactates and operative delivery. Previous studies in the UK and Sweden have shown an early fetal blood sample is associated with increase rates of caesarean section and requirement for multiple samples to be collected (3,5). However rates of instrumental deliveries are unknown.

Objectives

To determine the rates of instrumental, caesarean and normal vaginal delivery when intrapartum fetal blood sampling prior to cervical dilation of <4cm compared to those women who have fetal blood sample ≥4cm.

Method

Retrospective cohort study in one tertiary centre (2015-2017) of intrapartum women with a singleton fetus at term (≥37 weeks gestation) who underwent FBS. We compared women who required first FBS <4cm cervical dilation to those who had first FBS ≥4cm. The primary outcome was mode of delivery, secondary outcomes were neonatal complications. Univariate logistic regression was used to assess the association between degree of cervical dilatation at first FBS and mode of delivery as well as other birth outcomes, using the ≥4cm group was used as the reference.

Results

A total of 591 participants were included in the study. Of the 591 women, 39 (6.6%) had the first FBS <4 cm cervical dilation. Overall, the mean age of women was 32 years, mean BMI was 24 kg/m^2 and 518 (87.7%) of women were primiparous. There was no statistically significant difference in age, parity, BMI or prior caesarean section between those who had FBS <4cm cervical dilation and those who had sampling at ≥ 4cm. Women in the ≥4cm group were less likely to have a total of ≥ 2 FBS samples (p=0.003).

Mode of birth: Women who had the first fetal blood sampling at <4cm dilatation were twice as likely to have a caesarean section birth (Table 1). Interestingly, among the 125 pregnancies with spontaneous vaginal delivery, 6 out of 7 (85.7%) of the <4cm group were multiparous while 86 out of 118 (72.9%) of the ≥4cm group were multiparous.

Neonatal outcomes: There were no differences in arterial pH and lactate or venous pH between the groups. However, the mean venous lactate was slightly lower in the <4cm group (3.60 vs 4.44, p=0.010). There was no difference in rates of resuscitation or admission to nursery or neonatal intensive care between the two groups. Similarly, there were no differences in neonatal complications at birth or in the postnatal period.

Mode of delivery	FBS <4cm (%)	FBS ≥4cm (%)	OR (95% CI)	p Value
Spontaneous vaginal (n=125)	7 (18.0)	118 (21.4)	0.80 (0.35-1.87)	0.613
Instrumental (vacuum/forceps) (n=216)	9 (23.0)	207 (37.5)	0.50 (0.23-1.07)	0.076
Caesarean section (n=250)	23 (59.0)	227 (41.1)	**2.06 (1.06-3.98)**	0.032

Table 1. Mode of delivery when fetal blood sampling (FBS) required

Conclusion

Women who had their first fetal blood sampling <4cm cervical dilation were more likely to have a caesarean section compared to women who had their first fetal blood sampling ≥4cm, but their rates of instrumental delivery were unchanged. There was no difference in fetal outcome.

References
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