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Preterm birth following caesarean section at full dilatation: growing understanding of a preventable morbidity

Alexandra Ridout, Richard Stacey, Sam Page, Kristina Sexton, Susana Pereira

Introduction

- Rates of caesarean section including those at full dilatation are increasing worldwide[1]
- There has been a concurrent decline in operative vaginal deliveries, possibly linked to concerns around trauma to the newborn and training challenges
- It is well established that caesarean section in the second stage results in greater incidence of morbidity[2]
- However in addition there is increasing evidence that caesarean section at full dilatation (FDCS) is a risk factor for late miscarriage and spontaneous preterm birth (sPTB)[3, 4]

Research Question

- We know that spontaneous preterm birth or late miscarriage is rare following full term pregnancy
- Therefore to investigate a potential link between mode of delivery and sPTB, we compared the gestational age at delivery from a 2nd pregnancy by mode of theatre delivery, during their first pregnancy:
  - Elective caesarean section
  - Instrumental delivery in theatre
  - Full dilatation caesarean section

Methods

- A retrospective cohort analysis of women with two or more consecutive deliveries from Kingston Hospital, between 2007 and 2016
- Women with a history of sPTB were excluded, as were those who underwent iatrogenic preterm deliveries in their second pregnancy and twin pregnancies
- The primary outcome was sPTB <37/40 in the consecutive pregnancy. We also collected and compared data on intrapartum morbidity and anaesthetic complications
- Gestational age of delivery and maternity intrapartum morbidity was assessed and compared between groups. Odds ratios were calculated. P<0.05 was used to demonstrate statistical significance

Results

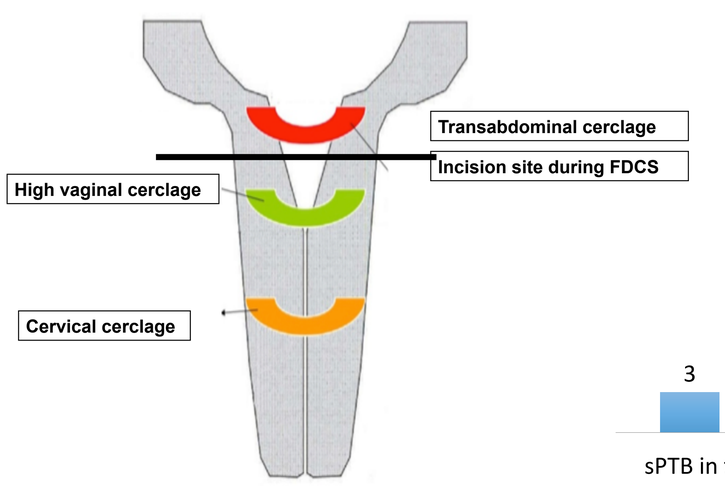
1284 women were identified as have had two consecutive deliveries within the study centre, 597 who fulfilled our criteria for analysis. In their initial, full term pregnancy, 365 delivered by ELCS, 181 by instrumental delivery and 53 by FDCS

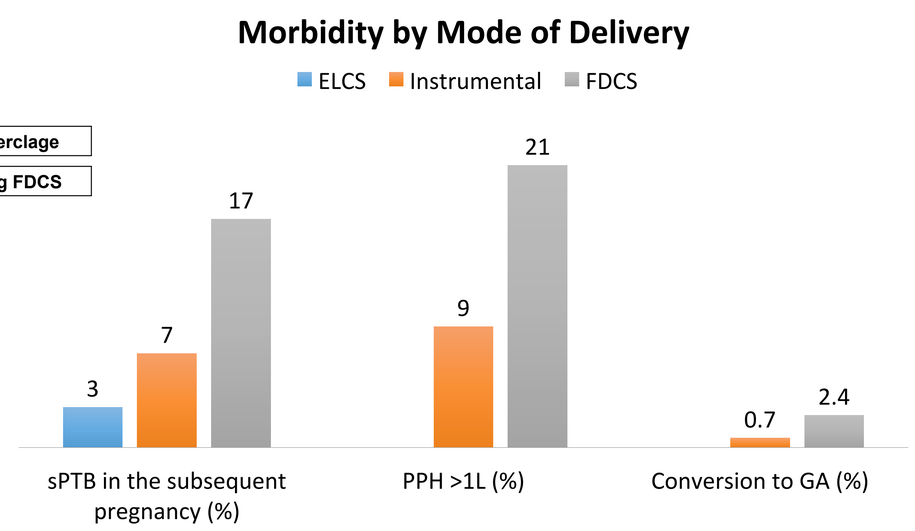
Women have significantly higher rates of preterm birth if delivered by FDCS in their first pregnancy

	Instrumental	FDCS	Odds Ratio, 95% CI	Comparison (p value)
sPTB <37 weeks	13/181 7%	9/53 17%	2.6 95% CI 1.06 to 6.58	P = 0.037
PPH >1L	9%	21%	2.8 95% CI 2.26 to 3.51	P < 0.0001
Conversion to GA	0.7%	2.4%	3.5 95% CI 1.90 to 6.32	P < 0.0001

There was a significant increase in sPTB in the subsequent pregnancy for women who had undergone caesarean section at full dilatation, compared to those who delivered by instrumental delivery in theatre [17% versus 7%, p=0.037]

33% of spontaneous preterm deliveries in the pregnancy following a FDCS were less than 34 weeks, and 22% were less than 28 weeks of gestation





It has been hypothesized that an unintentional incision in the cervix, as the cervix is drawn into the lower segment at full dilatation, disrupts the function of the internal os, resulting in early delivery

The concept of cervical damage at late stage caesarean is not new, and was clearly defined in 1939 by C. M. Marshall[5]

Conclusion

- Women with full term FDCS have a significantly higher than expected rate of subsequent sPTB, compared to alternative modes of delivery in theatre. They also suffer increased delivery-related morbidity
- As the caesarean section rate continues to rise, the implications of this cannot be ignored
- Clinicians must be aware of the risks, and education focused on managing delay in labour, as well as maintaining skills in operative vaginal delivery
- Future research is needed to guide antenatal counselling, as well as potential sPTB surveillance guidelines for women following FDCS

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