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Exploring full cervical dilatation caesarean sections—A retrospective cohort study



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ABSTRACT

Background: The rate of caesarean sections at full cervical dilatation with their high risk of morbidity continues to rise mirroring the overall increase in caesarean section rates internationally.

Objectives: The objectives of this study were to determine the rate of full dilatation caesarean section in a tertiary referral unit and evaluate key labour, maternal and fetal factors potentially linked to those deliveries. We also assessed maternal and fetal morbidity at full dilatation sections. Where possible, these were compared with successful operative vaginal deliveries carried out in theatre to determine key differences.

Study design: Retrospective cohort study. We reviewed the rate of full dilatation caesarean section over a 10-year period. We analysed deliveries (caesarean sections or operative vaginal deliveries) in single cephalic pregnancies ≥ 34 weeks with contemporaneously collected data from our unit's electronic database for 2015.

Results: The rate of full dilatation caesarean section increased by over a third in the ten-year period (56/6947 (0.80%) vs 92/7378 (1.24%), $p = 0.01$). Of 84 full dilatation caesarean sections who met the inclusion criteria, 63 (75%) were nulliparous and the mean maternal age was 33 (± 5) years. Oxytocin was used in the second stage in less than half of second stage caesarean sections (22 out of a recorded 57, 38.6%). There were more fetal head malposition (occipito-posterior, or occipito-transverse) at full dilatation caesarean section compared to successful operative vaginal deliveries (41/46 (89.1%) vs 2/21 (9.5), $p < 0.001$). The rate of significant postpartum haemorrhage (defined as estimated blood loss ≥ 1000 ml) was similar in both full dilatation caesarean section and operative vaginal deliveries. There was no difference in the mean birthweight at full dilatation caesarean sections compared to operative vaginal delivery (3.88 kg (2.80–5.33 kg) vs 3.48 kg (1.53–4.40 kg)). There was no difference in neonatal morbidity.

Conclusion: Fetal head malposition is associated with a higher risk of full dilatation caesarean section. Interestingly, maternal and fetal morbidity were similar between full dilatation caesarean sections and anticipated difficult operative vaginal deliveries carried out in theatre. The management of labour in terms of the decision to use oxytocin judiciously in hope of correcting inefficient uterine contractions and continuous labour ward training, particularly the diagnosis of malposition and its correction may be beneficial in reducing the rate of full dilatation caesarean sections.

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Introduction

The rate of increase of caesarean section (CS) is an international phenomenon [1]. This trend has been mirrored by an opposing downward trend of rates of operative vaginal delivery (OVD) as demonstrated in recent studies [2]. The 2015 National Vital Statistics Report from the Centers for Disease Control and Prevention demonstrated the dramatic impact of CS on maternal

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morbidity, both in the index pregnancy and in future pregnancies, notably the need for maternal transfusion, ruptured uterus, unplanned hysterectomy and admission to the intensive care unit (ICU). The rate for ICU admission alone was three times higher with primary CS versus vaginal birth with no history of CS (525/100,000 vs 167/100,000) [3]. It is worth considering that while CS has increased five-fold from 1970 to 2000, it has had no significant impact on the incidence of cerebral palsy [4]. Within the National Maternity Hospital, a tertiary referral centre with greater than 9000 deliveries per year, where the active management of labour is practiced, the rate of CS has increased from 18.3% in 2005 to 23.5% in 2014 with a converse decrease in the rate of OVD from 14% to 11% in the same period [5]. Most international data have shown a similar increase in the rate of CS in the second stage of labour, a procedure recognized as more technically challenging [6]. This has been demonstrated to have been a significant trend, rising in some units from 0.9% to 2.2% from 1993 to 2001 [7]. In the United Kingdom it is estimated that as many as 8000 CS are now performed in the second stage of labour per year [8]. However, this is not a universal finding as a recent Australian study did not show any observed trend in rates [9]. In Ireland, some units have seen a doubling of the rate in a short period of time [10]. We aimed to contemporaneously evaluate full dilatation CS performed over a one-year period in our institution. We looked at the rate, the indication for delivery, if a trial of instrumental was deemed safe prior to CS, and the morbidity associated with second stage CS. We also sought to determine key differences between those who had a successful trial OVD in theatre and those who had a full dilatation CS.

Material and methods

We reviewed the overall rates in our centre of all full dilatation CS over a ten-year period 2006–2015 [5]. We carried out a retrospective cohort study. Data was collected from the unit's electronic database (contemporaneously recorded) for deliveries by CS at full dilatation in single cephalic pregnancies ≥ 34 weeks. We included nulliparous and multiparous women in spontaneous or induced labour. The comparison group (where data was recorded) were deliveries meeting the same criteria who had a successful OVD who were considered at risk of requiring a full dilatation CS. We defined these potential "difficult" instrumental deliveries as those performed as a trial of instrumental in theatre.

We also reviewed aspects of the management of labour including senior obstetrician (defined as completed specialist training) presence at the delivery, whether the labour was induced or spontaneous, and the use of oxytocin in the second stage of labour. During the study period, there was no change in obstetric consultant (completed specialist training) staff but there was a change in obstetric registrars (doctors in training) in July. Vacuum and direct traction forceps are routinely used in our unit, but rotational forceps are not used. Descriptive statistics were used for maternal, neonatal, labour to characterise the study population. The morbidity analyses were in two groups comparing full dilatation CS and trial of instrumental deliveries in theatre. Univariable and multivariable logistic regression analyses were performed and the results are presented as crude odds ratio (OR) and 95% confidence intervals (95% CI). SPSS version 21 was used for all analyses.

Results

In 2015, there were 9186 deliveries of which 4056 (41.1%) were nulliparous and 5130 (58.9%) were multiparous. Following review of the data, the number of patients with a full dilatation CS eligible for inclusion was 84; 8 were excluded as outlined in the results and the recorded data for these 84 analysed. There were 21 instrumental deliveries carried out in theatre eligible for the study. Following review of the data, eight patients were excluded from further analyses: four patients had not reached second stage on re-assessment in theatre by a senior obstetrician, three were multiple pregnancies, and one was less than 34 weeks gestation. The recorded rate of all full dilatation CS in women diagnosed in labour increased from 56/6947 (0.8%) to 92/7378 (1.24%), $p = 0.01$ (Fig. 1). Of the eligible 84 full dilatation CS, 63 (75%) were nulliparous and the mean maternal age was $33(\pm 5)$ years. There were almost equal numbers in spontaneous labour ($n = 45$) (53.6%) compared to induced ($n = 39$) (46.4%). There was no significant difference in the proportion of patients with a Body Mass Index ≥ 30 between the groups. There was no difference in mean birthweights at second stage CS 3.88 kg (range 2.80–5.33 kg) versus 3.48 kg (1.53–4.40 kg) for instrumental deliveries. We also analysed indicators of maternal and neonatal morbidity for both groups. The rate of significant postpartum haemorrhage (defined as estimated blood loss (EBL) ≥ 1000 ml) was similar in both the full dilatation CS and instrumental delivery groups (Table 1). Indeed, for those in the CS group a failed trial of instrumental did

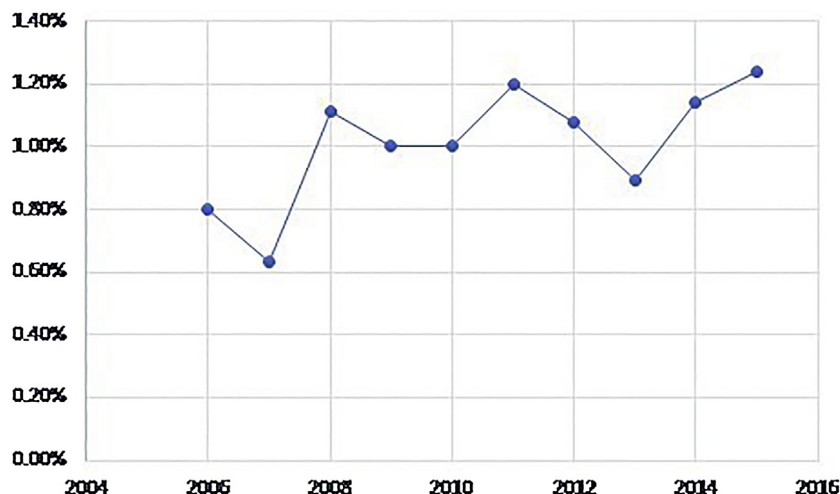


Fig. 1. Rate of Full Dilatation Caesarean Sections as a % of Women in Labour 2006 to 2015.

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