European Journal of Obstetrics & Gynecology and Reproductive Biology 157 (2011) 141–144

Contents lists available at ScienceDirect

European Journal of Obstetrics & Gynecology and Reproductive Biology

journal homepage: www.elsevier.com/locate/ejogrb

# Rising rates of caesarean deliveries at full cervical dilatation: a concerning trend

J. Unterscheider *, M. McMenamin [1], F. Cullinane [2]

*Department of Obstetrics and Gynaecology, University Hospital Galway, Newcastle Road, Galway, Ireland*

ARTICLE INFO

*Article history:*
Received 20 October 2010
Received in revised form 14 February 2011
Accepted 5 March 2011

*Keywords:*
Caesarean section
Caesarean delivery
Full dilatation
Second stage of labour

ABSTRACT

*Objectives:* To audit caesarean sections performed at full cervical dilatation over a three year period in a tertiary referral centre in Ireland. To evaluate (i) the rate of caesarean deliveries in the second stage of labour, (ii) the indication for delivery and (iii) the associated fetal and maternal morbidity in this cohort of women.

*Study design:* This cohort study was carried out in the University Hospital Galway (UHG). Medical records of 136 consecutive women with singleton cephalic pregnancies at term, identified from the hospital database, who underwent a second stage caesarean section (CS) between 1 January 2006 and 31 December 2008, were reviewed retrospectively and demographic and outcome data were collected.

*Results:* During the study period 2801/10,202 (27.5%) babies were delivered by CS. One hundred and thirty six CS (4.8%) were performed at full dilatation. The rate of CS during the second stage increased from 0.9% in 2006 to 1.8% in 2008. The majority of women were nulliparous (76.5%) and in spontaneous labour (64%). 44.1% of women had a second stage CS without a trial of instrumental delivery. 41.3% of public deliveries were attended by a consultant. The majority of babies (54%) were delivered because of a prolonged second stage with a mean duration of 146 min from full dilatation to delivery. Twenty-four of 59 primiparous women (40.7%), who underwent CS because of a prolonged second stage, did not receive oxytocin. 13.2% of babies were admitted to the neonatal intensive care unit. Estimated blood loss was documented in 67% of cases ($n = 91$); 14.3% of women ($n = 13$) had a postpartum haemorrhage greater than or equal to 1000 mls. 23% of these women ($n = 3$) required a blood transfusion. The overall blood transfusion rate was 2.2%. 50% of women had a hospital stay of greater than four days.

*Conclusions:* There is a worrying rise in the overall rate of CS at full dilatation. Audit of the second stage CS rate is a useful measure of clinical standards. Strategies for improved care include increased consultant presence, meticulous documentation and ongoing training of junior obstetric staff to ensure safe intrapartum care.

*Condensation:* The increase of second stage caesarean sections requires urgent strategies for improved care including increased consultant presence, meticulous documentation and training of junior obstetric staff.



## 1. Introduction

Decision-making surrounding caesarean section (CS) in the second stage of labour is one of the great challenges in current obstetric practice. This technically difficult procedure is often performed after an unsuccessful instrumental delivery with the fetal head deeply impacted in the maternal pelvis. It is associated with an increased risk of maternal and neonatal morbidity [1]. As the overall CS rate continues to rise, so too does the CS rate at full dilatation [2]. Junior obstetric trainees are not always supervised when faced with deciding and performing these difficult deliveries. Input from a senior, more skilled obstetrician has been shown to revert decisions in favour of a successful vaginal delivery, therefore avoiding the potential risks associated with full dilatation sections [3].

The reasons for the increasing rate of CS are multifactorial. CS is now considered a safe option for childbirth, given advances in anaesthesia, and the availability of thromboprophylaxis and antibiotics. Junior trainees are nowadays often better trained in performing a CS than an instrumental vaginal delivery and a CS is sometimes the first procedure a trainee performs when starting a career in obstetrics (even before performing a normal vaginal delivery). The art of a skilled and safe operative vaginal delivery

* Corresponding author. Current address: Royal College of Surgeons in Ireland, Rotunda Hospital, Parnell Square, Dublin 1, Ireland. Fax: +353 1 873 3760; mobile +353 85 104 2494.
*E-mail addresses:* juliaunterscheider@rcsi.ie, julia_unterscheider@hotmail.com (J. Unterscheider).
[1] Current address: National Maternity Hospital, Holles Street, Dublin 2, Ireland.
[2] Current address: Royal Women's Hospital, Flemington Rd., Grattan St., Parkville VIC 3052, Australia.

0301-2115/$ – see front matter © 2011 Elsevier Ireland Ltd. All rights reserved.
doi:10.1016/j.ejogrb.2011.03.008

may be lost over time. Observational data from a large maternity unit in Ireland show that both rotational and non-rotational forceps were used for 18% of deliveries in 1980 with a decline to 5% in 2009. Over the same period the use of ventouse increased from 0.9% to 15%, and the rate of CS tripled from 8% to 28% [4]. Forceps is now rarely used in many European countries. The lack of training and direct supervision, coupled with reduced working hours per week following the implementation of the European Working Time Directive will lead to a further loss of clinical skills.

The aims of this audit were to determine (i) the rate of CS during the second stage of labour (ii) the indications and (iii) the associated maternal and neonatal morbidity, with a view to suggesting strategies for improvement in the future.

## 2. Materials and methods

This cohort study was carried out between 1st January 2006 and 31st December 2008 in University Hospital Galway (UHG), Ireland. The medical records of 136 consecutive women with singleton cephalic pregnancies at term, who underwent a second stage caesarean section, were identified from the hospital database. They were reviewed retrospectively and demographic and outcome data were collected. Twins, breech deliveries and preterm births were excluded from this audit. Data analysis was performed using the statistical package SPSS (Version 18).

## 3. Results

During the study period 2801/10,202 (27.5%) babies were delivered by CS. One hundred and thirty-six CS (4.8%) were performed at full dilatation. As demonstrated in Fig. 1, the rate of CS during the second stage increased from 0.9% in 2006 to 1.3% in 2007 and to 1.8% in 2008. This rise was statistically significant ($p = 0.003$) and means that women attending for antenatal care in 2008 were nearly twice as likely (OR 1.92) to have a CS at full dilatation than women attending in 2006. Table 1 summarizes the maternal and fetal characteristics. Six of the 20 women (30%) in their second ongoing pregnancy had a previous CS. 50% of women in their third ongoing pregnancy had one previous CS. No woman in this study had more than one previous CS.

Seventy-four women (54.4%) were delivered because of a prolonged second stage. The definition of prolonged second stage was adopted from the delivery indication documented by the attending clinician in the patient's chart. The mean duration of the second stage for all women in this group was 146 min (range 33–290 min). Interestingly, one fifth (20.6%) of all women in this group did not receive oxytocin. Twenty-four of 59 primiparous women (40.7%) who had a CS because of a prolonged second stage did not receive oxytocin.

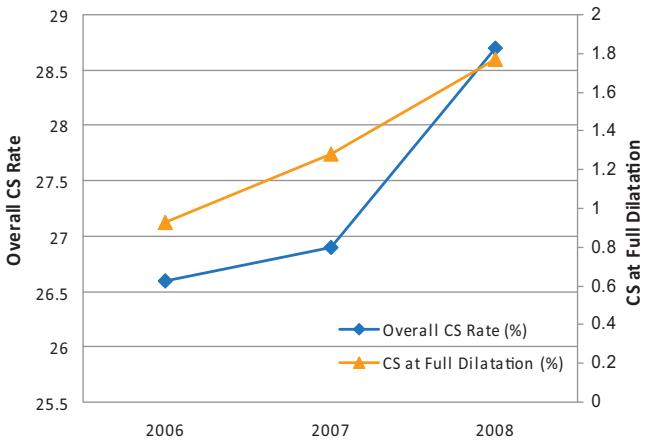


**Fig. 1.** Rise of CS at full cervical dilatation correlated with CS rate overall.

Fifty-five women (40.4%) were delivered because of non-reassuring fetal status. Two of these were due to cord prolapse with the station of the head too high to safely conduct an instrumental delivery. Fifteen babies (27.3%) delivered because of non-reassuring fetal status had meconium-stained liquor at birth and twelve (21.8%) had fetal blood sampling performed during labour. The overall rate of fetal blood sampling was 11.8% ($n = 16$). Eight babies delivered for non-reassuring fetal status (14.5%) had an arterial cord pH less than 7.1 and eight neonates needed admission to the special care unit.

The remaining seven women were delivered because of a brow presentation ($n = 6$) or a mentotransverse face presentation ($n = 1$). The mean duration of the second stage for the brow presentations was 86 min (range 28–147 min).

Seventy-six women (55.9%) had a trial of instrumental delivery. In the remainder an attempt at vaginal delivery was deemed unsafe because of one of the following; (i) high presenting part, (ii) malpresentation, (iii) profound fetal bradycardia or (iv) non-reassuring pH necessitating immediate delivery. 71% ($n = 54$) of unsuccessful attempts at an instrumental delivery took place in theatre. In 42 cases (55.3%) the instrument of choice was a vacuum cup. The Kiwi Omnicup was introduced at UHG in 2008 so the majority of ventouse deliveries were conducted with a metal cup. Neville Barnes forceps (NBF) were used in 11 cases (14.5%). A

**Table 1**
Characteristics.

| | 2006 $n = 29$ | 2007 $n = 43$ | 2008 $n = 64$ | $n = 136$ |
|---|---|---|---|---|
| Maternal | | | | |
| Age (years) | 31.2 [16–39] | 31.1 [17–42] | 31.2 [21–40] | 31.2 |
| Body mass index (kg/m$^2$) | 27.3 [18–51] | 27.7 [20–41] | 27.0 [18–57] | 27.3 |
| Parity 0 | 20 (69%) | 36 (83.7%) | 48 (75%) | 104 (76.5%) |
| Parity 1 | 4 (13.8%) | 7 (16.3%) | 9 (14.1%) | 20 (14.7%) |
| →Previous CS | 1 | 3 | 2 | 6/20 (30%) |
| Parity 2+ | 5 (17.2%) | 0% | 7 (10.9%) | 12 (8.8%) |
| →Previous CS | 2 | 0 | 4 | 6/12 (50%) |
| Induced labour | 10 (34.5%) | 18 (41.9%) | 21 (32.8%) | 49 (36%) |
| Public patient | 26 (89.7%) | 39 (90.7%) | 56 (87.5%) | 121 (89%) |
| Fetal | | | | |
| Birthweight (g) | 3801 | 3777 | 3730 | 3769 |
| Female gender | 9 (31%) | 14 (32.6%) | 30 (46.9%) | 53 (39%) |
| Occipito-posterior position[a] | 12/24 (50%) | 13/37 (35.1%) | 34/61 (55.7%) | 59/122 (48.4%) |
| Occipito-posterior at CS[a] | 10/20 (50%) | 19/34 (55.9%) | 38/59 (64.4%) | 67/113 (59.3%) |

[a] Over documented cases.