

Elective Cesarean Section- the Right Choice for Whom?

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Abstract: Cesarean section rates continue to rise. Reasons include changing demographics, altered clinical practice, and an increasing awareness of traumatic childbirth amongst the public, resulting in the phenomenon of 'Cesarean Section on demand'.

Obstetricians are involved in an increasingly acrimonious discussion, without having access to data that would allow true 'informed consent' regarding the choice of delivery mode. There are no scientific grounds for identifying an 'appropriate' level for Cesarean section rates, and no data to help us in counselling women who ask for elective Cesarean delivery.

A 'Term Cephalic Trial' may provide such information, but poses major logistic and ethical challenges. The key to a successful resolution of this issue may lie in individualized risk assessment. This has now become possible. Maternal age, a history of Cesarean Section in the parturient's mother, maternal body mass index, cervical length and/ or Bishop score, pelvic organ mobility and engagement of the fetal head are some of the factors that have recently been shown to be associated with delivery mode in nulliparous women.

Individual risk assessment may soon allow us to construct intervention trials that will be ethically sound, logistically feasible and resource- neutral. Even more importantly, we may eventually be able to provide true 'informed consent' to women considering elective Cesarean delivery.

Keywords: Antenatal tests, childbirth, elective cesarean section, informed consent, operative delivery.

Over the last several decades, the number of babies born by Cesarean section (C/S) has seen a steady increase in many countries around the globe. As an example, the latest numbers for Australia indicate that, in the higher age groups, Cesarean Section rates in primiparous women reached 44.2% in the private sector and 38% in public patients for women aged 35–39 years. Even higher rates are found in older women, with 59.1% of women aged 40 and above in private hospitals and 46.2% in public hospitals delivered by Cesarean in 2000 [1]. In large parts of the medical profession and the general public, this is perceived as a problem due to the higher morbidity and cost of Cesarean Section compared to normal vaginal delivery and due to potential negative long- term effects of the procedure, such as placenta praevia and accreta. Another objection is that childbirth is a natural process, and therefore any medical intervention is of evil and ought to be minimized.

The widely held opinion that we are doing too many Cesareans has no basis in scientific fact, even if virtually all publications dealing with C/S rates, whether from India [2], Chile [3], the UK [4, 5] or Australia [1], implicitly or explicitly support this point of view. Such negative assessments of current practice are usually based on opinions such as a World Health Organization statement published in 1985, citing 15% as an appropriate level for Cesarean Section rates [6] and an International Federation of Gynaecology and Obstetrics committee report stating that Cesarean Section should not be performed for 'non-medical'

reasons [7]. While many obstetricians in Australia and overseas would choose a Cesarean for themselves or their partners [8-10] and are prepared to perform an elective Cesarean on request, [11] the published scientific literature until recently seemed at variance with clinical reality.

The rise in Cesarean Section rates, most especially those performed for 'nonmedical reasons', is generally assumed to lead to negative consequences for mother, child and society in general. Consequently, significant effort has been expended in trying to arrest this trend, most recently in the form of national 'Guidelines for Cesarean Section' [12] in the UK which suggest that an expectant mother asking for an elective C/S delivery should be referred for counselling. Such attempts to reverse a worldwide trend of several decades' momentum would appear simply irrelevant and futile, were it not for the fact that such efforts have the potential to significantly interfere with the autonomy of both patients and caregivers. Not surprisingly, these guidelines produced by the National Institute for Clinical Excellence have led to much controversy [13].

Even if one accepted the (entirely arbitrary) proposition that women would be better off in a medical system that produced a C/S rate of 10 or 15%, there seems virtually no chance of reversing the trend of increasing C/S rates without restricting the freedom of choice of women and obstetricians, i.e., short of rationing access to surgical services. In western democracies, this is currently unthinkable for emergency procedures and very difficult to propose even for elective Cesarean Section.

Further rises in C/S rates are in fact likely for a number of reasons. Firstly, C/S morbidity and mortality continue to

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decline. In the UK, the relative risk of death associated with Cesarean delivery in the 1997–1999 triennium was two [14]. This figure includes emergency deliveries, and as the mortality of emergency Cesarean section is likely to be a multiple of elective Cesarean section [15, 16], it seems safe to assume that the true difference in mortality between an 'intention to perform elective Cesarean section' and 'intention to deliver vaginally' would be lower, possibly non-significant. There has been considerable concern regarding placenta praevia and placenta accreta/ increta/ percreta in a second pregnancy after C/S recently [17, 18], but the relative magnitude of such effects remains to be defined.

Secondly, our (and the public's) knowledge of the potential negative effects of vaginal childbirth is increasing rapidly. Neurophysiological investigations [19–21], imaging studies [22–24], urethral pressure measurements [25, 26], and clinical data [27] all indicate that vaginal delivery, in particular vaginal operative delivery, is associated with impairment of fascial pelvic organ support and levator ani structure and function, anal sphincter damage, as well as pudendal nerve trauma. Actual symptoms of prolapse or incontinence are much more difficult to evaluate, due to their latency and multifactorial aetiology. It is therefore not surprising that elective Cesarean Section seems to confer only partial protection against stress incontinence [28, 29]. However, the argument of uncertain or limited benefit is unlikely to convince a woman whose sister has experienced traumatic childbirth, whether in the sense of somatic (eg anal sphincter tear, urinary or faecal incontinence or symptomatic prolapse) or psychological trauma.

Thirdly there is the issue of demographic changes that has received scant attention to date. It has been known for a number of years that maternal age is a predictor of delivery mode, even if potential confounders such as medical morbidity and socio-economic status are controlled for [30, 31]. The author recently performed two small observational studies determining predictors of normal vaginal delivery, and in both studies maternal age was one of the strongest predictors of delivery mode [32, 33] in a Public Hospital population. Maternal body mass index also is an (albeit weaker) predictor [33], as is the baby's birthweight [33], and both continue to increase. We are in the middle of an obesity epidemic. One only has to consider the worrying incidence of obesity in children to despair of any future reduction in C/S rates. In summary, it appears evident that three major demographic factors are conspiring to reduce the likelihood of normal vaginal delivery in western societies and will continue to do so, barring major socio-economic disruptions.

Finally, there is very recent worrying data suggesting that the age at which a woman delivers her first child has a significant impact on pelvic floor morbidity. Both epidemiological data [34] and evidence from 3D pelvic floor imaging (unpublished own data) seem to indicate that women today may do more damage to their pelvic floor than their mothers or grandmothers did- possibly due to age-related changes in connective tissue biomechanics. If this were to be confirmed, the two trends of higher age at first delivery and increasing knowledge of the traumatic effects of vaginal childbirth would amplify each other and of course

there may well be significant public health issues regarding future increases in pelvic floor morbidity.

Clearly, it seems unrealistic to expect a reduction in C/S rates in the medium term. We therefore ought to stop complaining about high intervention rates- they are here to stay, and likely will increase further. Obstetricians (and their patients) will simply have to deal with the fallout such as abnormalities of placentation, unless women stop having second or third babies altogether. There are other aspects of this issue though that are clearly deserving of (and rather more amenable to) improvement.

What are we supposed to tell the expectant mother who wants to discuss elective Cesarean Section for her first child? We are expected –in fact are duty bound- to provide informed consent, allowing her to come to a decision she is happy with, based on all available fact. Unfortunately 'informed' consent is almost impossible at present since there is so little information. We have no idea whether, in a particular patient, an elective Cesarean Section would be preferable to an attempt at vaginal delivery. Undoubtedly there are women out there who would be much better off having their baby by elective C/S at 38+4 weeks rather than undergoing an induction at 41+4 only to end up with an emergency C/S two days later, after 32 hours in labour- even if there was no major maternal or neonatal morbidity. Without specific information allowing us to estimate the level of risk, we are trained to take the safe, predictable way out. Who are we to blame expectant mothers for choosing the same path?

It has been suggested that truly 'informed' consent may be impossible unless we undertake a randomised controlled trial of elective C/S in 'normal' nulliparous women, a 'Term Cephalic Trial' [35]. However, it is clear from trials involving breech presentation that many thousands of women would have to be randomised to obtain adequate power for most outcome parameters. In addition, concerns have been raised as to whether such a trial would be ethically acceptable [36]. There are a number of developed countries in which the politics of childbirth would probably not allow such a trial to be organized- and even if such a trial was to be successfully concluded, it would probably be obsolete by the time meaningful medium-term results were obtained.

Fortunately, there may be a simpler and more effective approach to the issue of informed consent regarding delivery mode. What we need is an assessment of individual risk. Such risk assessment may eventually be possible for the risk of pelvic floor trauma, incontinence and prolapse [37], although the long latencies of those outcomes will require followup studies extending over many years. In the short term it may well be more productive to focus on the likelihood of normal vaginal delivery in a given individual. Emergency operative delivery is associated with a whole host of unfavourable outcomes, such as febrile morbidity [16], postnatal depression [38, 39], a sense of personal failure, [40] reduced future fertility [41], marital and/or sexual problems [42], as well as urinary incontinence [43, 44], impairment of pelvic organ support [23], anal sphincter trauma and faecal incontinence [45].

A number of antenatal predictors of unplanned (emergency) operative delivery have recently been described in the literature. Demographic factors such as maternal age and body mass index are mentioned above. Cervical length has been shown to be predictive of the outcome of induction of labour [46, 47]. Recently, it has been demonstrated that antenatal pelvic organ mobility, which may describe an aspect of 'pelvic compliance', is associated with delivery mode [48]. Clinical assessment of engagement of the fetal head [49] also is a predictor, although ultrasound determination of the same seems to be more strongly associated with delivery mode [50].

In a recently conducted prospective observational study we tested potential clinical predictors (such as age at delivery, maternal body mass index, history of C/S in the patient's mother, weight gain in pregnancy, palpation of head engagement and Bishop Score) and ultrasound parameters of potential predictive value (cervical length, anterior vaginal compartment mobility on Valsalva and position of the fetal head). A model derived from those parameters was moderately predictive of delivery mode, reaching a corrected Nagelkerke R^2 of 26.8% in a group of 125 nulliparae with uncomplicated singleton pregnancies assessed between 36 and 40 weeks' gestation [33].

Predictive models such as the one described above constitute a novel antenatal test defining the risk of unplanned operative delivery, similar to models determining the risk of aneuploidy from maternal age, nuchal translucency and biochemical markers. As always with new diagnostic interventions, the most important question to be answered is whether performing the test improves clinical outcomes. In a group of expectant mothers at high risk of emergency operative delivery, the obvious intervention is elective Cesarean Section. A randomised controlled trial of antenatal risk assessment for unplanned operative delivery will necessarily also test the intervention of elective Cesarean Section - and allow us to do this in an ethically sound and logistically feasible way. Initial calculations suggest that an intervention trial undertaken amongst the 20% of the population with the lowest likelihood of normal vaginal delivery would be resource- neutral, due to the lower cost of elective compared to emergency Cesarean section. Of course, intervention may also be feasible at the low risk end of the spectrum, selecting women for low- tech birthing units or, in countries such as Australia or Canada, allowing more women to deliver close to their home environment.

If individualized risk assessment for unplanned operative delivery were shown to be beneficial, the discussion surrounding Cesarean Section on demand might well become redundant. Obstetricians would finally be able to provide true 'informed consent' to women, enabling them to make their own decisions based on fact rather than hearsay and speculation.

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