Rising rates of Caesarean sections: an audit of Caesarean sections in a specialist private practice

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Keywords: Caesarean section rates; private health sector

Abstract

Background: Caesarean section (CS) rates are increasing worldwide; rates in the private sector in South Africa are reported to be particularly high. To the best of our knowledge there has been no recent audit of Caesarean sections performed by the private health sector in KwaZulu-Natal. The aim of this study was to carry out an audit of CS in a private practice.

Methods: An audit of the patient records over a period of one year was done. No personal identifiers were noted or reported on. All relevant clinical data were pooled and used to analyse the clinical information.

Results: There were 364 deliveries in the study period and 209 of these were CS, giving a rate of 60.4%. Most of the caesarean sections were carried out because of a previous CS; maternal request and HIV status also contributed to the high rate.

Conclusion: The high CS rate in private practice is probably a window to the increased rates of Caesarean section being performed worldwide. This high rate is in keeping with trends in countries such as South America, and is considerably higher than the ideal rate of 10 to 15% in low-risk obstetric populations suggested by the WHO.

Ⓟ **This article has been peer reviewed.** **SA Fam Pract 2009;51(3):254-258**

Introduction

Caesarean section (CS) is a relatively common procedure in obstetric practice. However, CS rates vary worldwide, ranging from approximately 10% in Sweden to about 80% in private-sector hospitals in Brazil.[1,2]

Rates of approximately 30% are reported from regional and tertiary public hospitals in the Durban Metropolitan area (Department Statistics, KEH, 2007). These high rates are probably due to large proportions of high-risk patients attending tertiary and regional public hospitals in South Africa. Lower rates of CS would be expected in the private health sector, which is generally attended by people from the middle and high socio-economic population groups.

Caesarean section rates have been reported to be high in some private hospitals in South Africa.[3] More recently, Tshibangu et al. (2002) did a retrospective clinical survey comparing CS deliveries in the private sector with those in teaching and public hospitals in Gauteng, South Africa.[4] These authors found, on average, a CS rate of 57% (11,572 CS in 20 151 deliveries) at six private hospitals over a three-year study period compared to a CS rate of 28% and 19% in one teaching hospital and 20 public hospitals respectively. The high CS rate in the private sector is of concern, particularly as the study was done between 1998 and 2000 and the rates showed a steady increase from 1998 to 2000.

Current available data from well-resourced countries suggest that morbidity and mortality for both mother and baby arising from CS are higher when compared with vaginal delivery.[5] Since these reports, CS rates are thought to have increased further due to maternal requests for planned CS and CS for HIV pregnant women. The present audit was therefore done to establish whether there is a further increase in CS rates in the private health sector in South Africa.

Methods

Institutional ethical approval and permission from a specialist private practice to audit the bed letters/notes of all their patients who had a CS over a period of one year (2004) was obtained. The practice was located in central Durban and all Caesarean sections were done at five private hospitals in this area. The majority of the population attending this private practice were on a medical aid scheme and belonged to the middle and high socio-economic groups.

Demographic and clinical data, indications for CS and complications were recorded on a structured data form. No personal patient information was obtained or recorded. In addition, no personal identifiers were included in the data sheets. Only pooled data are presented. Gestational age was expressed in weeks and was based on an ultrasound performed before the twentieth week of gestation.

Caesarean sections for cephalo-pelvic disproportion (CPD) were performed on both an emergency and elective basis. The policy of this particular private practice was that CPD was highly likely in a patient with a high presenting part, an unfavourable cervix (i.e. low Bishop's score) and/or a clinically big baby.

CD4 counts and viral loads were performed on all HIV-infected patients, and they were referred to specialist physicians for the commencement of treatment with antiretroviral (ARV) drugs. These patients were delivered by elective CS and their babies were referred to neonatalogists for early HIV testing and appropriate follow up.

Vaginal birth after CS and external cephalic version (ECV) at 37 weeks were offered following the provision of appropriate information and counselling to patients with previous CS and breech presentations respectively. Similarly, patients with twin pregnancies were given the option of deciding on the mode of delivery. Caesarean section was also performed on request in this practice, following information sharing and counselling.

It was the policy of this practice to use oxytocin for the augmentation of labour – very sparingly and judiciously in the presence of poor progress due to concerns of uterine hyper-stimulation and possible fetal distress.

Definitions

The Caesarean sections performed were divided into three groups on the basis of the following definitions, which are endorsed by the Royal College of Obstetricians and Gynaecologists: elective – at a time to suit the patient and the maternity team (obstetricians, anaesthetist, neonatologist and the nursing team); urgent – maternal or fetal compromise that is not immediately life-threatening; emergency – immediate threat to life of woman or fetus.

Statistics

Descriptive statistics were utilised and all results are presented as frequencies, means and percentages.

Results

There were a total of 346 deliveries during the one-year study period. Of these, 137 were vaginal deliveries and 209 were CS, giving a CS rate of 60.4%.

As reflected in Table I, there were no major differences between elective and emergency CS with regard to maternal age, parity and gestational age. However, the mean gestational age at delivery for the urgent CS was earlier when compared to the other two CS groups.

Table I: Demographic data

Number of NVDs	137		
Number of CS	209		
Total number of deliveries	346		
Caesarean section rate (5)	60.4		
	Elective CS Mean (range)	**Emergency CS Mean (range)**	**Urgent CS Mean (range)**
Maternal age – years	31 (20–45)	30 (19–43)	28 (24–36)
Parity	1 (0–5)	1 (0–3)	1 (0–3)
Gestational age – weeks	38 (28–40)	38 (27–41)	36 (30–41)

NVD – normal vaginal delivery CS = Caesarean section

Laboratory data

The mean haemoglobin (Hb) level in all three groups was similar; the mean Hb was 11.8, 12.0 and 12.1 g/dl in the elective, emergency and urgent CS groups respectively, and the range varied between 11.8 and 12.1 g/dl. There were 10 patients who were HIV positive; eight had elective CS, one had an urgent CS, and the other had an emergency CS.

Indications for Caesarean section (Tables II to IV)

Of the 209 CS performed, 109 were elective, 18 urgent and 82 emergency. The majority of elective CS were done for previous CS (51 for previous CS x 1 and 13 for previous CS x 2).

Table II: Indications for elective Caesarean sections

Indication	Frequency	Per cent
Caesarean section on request	9	8.3
*Previous caesarean section x 1	51	46.8
Previous caesarean section x 2 or more	13	11.9
Bad obstetric history	1	0.9
Placenta praevia	2	1.8
Malpresentation (BX)	5	4.6
Leading twin breech	2	1.8
Elderly primigravida	1	0.9
Medical condition	3	2.8
Infertility	4	3.7
CPD	8	7.3
Previous myomectomy	1	0.9
Multifibroid uterus	1	0.9
HIV	8	7.3
TOTAL	109	100.00

* 41 of the 51 patients with previous CS x 1 were offered VBAC; all declined.

Table III: Indications for urgent Caesarean sections

Urgent	Frequency	Percentage
Gestational hypertension / pre-eclampsia + IUGR	6	33.3
Gestational hypertension / pre-eclampsia / no IUGR	6	33.3
Idiopathic IUGR	4	22.2
Twin-to-twin transfusion syndrome	1	5.6
Postdates + reduced liquor	1	5.6
Total	18	100.00

IUGR – intrauterine growth retardation

Two sets of twins were delivered by elective CS because, in both cases, the leading twin was breech, and five elective CS were done for breech presentations. The remainder of the elective CS were performed for standard obstetric indications, with the exception of two groups of patients. The first group consisted of nine patients in whom CS was performed on request. This group was analysed separately. The second group consisted of eight patients who had CS performed because of their positive HIV status. Eight patients had elective CS for CPD.

Caesarean section on request

Nine patients requested CS. The mean age of these patients was 29 years, at a mean gestation of 38 weeks and a mean parity of one. When compared to elective CS for other indications, the mean age and gestational age were similar. With regard to the professions of those who requested CS, three were professionals (all teachers). Five were primigravidae, three were parity 1 and one was parity 2. The reasons for

Table IV: Indications for emergency Caesarean section

Indication	Frequency	Percentage
Failure to progress	3	3.7
Cephalopelvic disproportion	18	22.0
Combination cephalopelvic disproportion + fetal distress	3	3.7
Failed induction of labour	6	7.3
Breech presentation in labour	1	1.2
Abruptio placentae G2	9	11.0
Failed VBAC	1	1.2
Twins, PROM, leading twin breech	1	1.2
Previous caesarean section x 3 + imminent eclampsia	1	1.2
Imminent eclampsia + unfavourable cervix	1	1.2
Previous caesarean section x 1 + PROM	5	6.1
PROM + unfavourable cervix	4	4.9
Previous caesarean section x 1 in labour (declining VBAC)	3	3.7
Twin pregnancy, advanced maternal age	1	1.2
Delayed 2nd stage	2	2.4
Antepartum haemorrhage of unknown origin	4	4.9
CTG abnormality	9	11.0
Meconium	5	6.1
Meconium + CTG abnormality	5	6.1
Total	82	100.00

CTG = cardiotocograph; VBAC = vaginal birth after caesarean section;
PROM = prelabour rupture of membranes

requesting CS were only documented for two of the nine patients. One patient was a primigravida with a fear of vaginal delivery and another (parity 1) did not want to risk undergoing a repeat episiotomy.

Neonatal outcome

There was one early neonatal death (ENND) and one infant death. The first patient was a 26-year-old primigravida who was delivered by emergency CS at 35 weeks of gestation because of decelerations on electronic fetal heart rate monitoring by cardiotocograph (CTG). The patient was not in labour, but was also known to have intra-uterine growth restriction (IUGR) with reduced liquor and absent end diastolic flow (AEDF). A baby with poor Apgar scores and weighing 1.9 kg was delivered. The baby was diagnosed with Down's syndrome following delivery and was ventilated, but died after one week because of hypoplastic lungs.

The second patient had an emergency CS for abruptio placenta grade 2 at 27 weeks' gestational age. A baby weighing 1 kg was delivered and was ventilated for six days. The baby died on day 35 due to septicaemia.

Maternal morbidity

One patient had wound infection; she was a gestational diabetic and had undergone an elective CS for gestational diabetes.

There was one case of secondary post partum haemorrhage (PPH), which occurred 48 hours after elective CS for previous CS x 1, having delivered a 3.3 kg baby. The bleeding stopped following the administration of an oxytocic infusion.

Discussion

There are very few studies that provide comparative figures for CS rates in the private and public health sectors in South Africa. Price and Broomberg conducted a retrospective analysis of CS rates among white nulligravida aged 20 to 35 years.[7] Data were collected from the records of 637 patients who delivered in a tertiary state hospital and 620 patients belonging to three medical aid schemes, most of whom delivered under the care of private practitioners. A CS rate of 19.5% was found in the tertiary health institution, while the CS rate in the medical aid scheme patients was 28.7%. The authors therefore concluded that patients delivering in the private "fee-for-service" sector were 50% more likely to have a CS than those delivering in the public sector (28.7% vs 19.5%). This information is similar to that in reports from the rest of the world, which show that CS rates in the private sector are much higher than those in public hospitals.[5]

The CS rate of 28.7% among patients belonging to medical aid schemes reported by Price and Bloomberg is much lower than the CS rate of 60.4% found in the present audit. This high figure probably reflects the trend of rising CS rates seen in recent years, as the aforementioned study was conducted 15 years before the present audit, but may also be higher due to factors that were not as significant 15 years ago as they are now, viz. maternal request for CS, the HIV status of the patient and the fear of litigation due to an increasing number of malpractice cases in South Africa.

Indications for caesarean section

The main overall indications for CS in the present audit were previous CS (51/209; 24.4%) emergency CS for CPD (17/209; 8.13%) and elective CS for previous CS x 2 (13/209, 6.2%). These findings are not dissimilar to those reported by Tshibangu et al.4 It ought to be noted that these authors were only able to obtain data on indications for CS done at one of the six private hospitals, in which 74.6 % of the CS were performed electively and the most common indication for elective delivery was a previous CS (39.2%). This probably indicates that the main indications for CS in the private sector are similar throughout South Africa. Documentation of indications for CS appears to be a problem in the private health sector, however, since the present audit found that although the policy of the audited private practice was to offer vaginal birth after Caesarean section (VBAC) to all patients who had had a previous CS, there were no records of this in the patients' charts. It seems contradictory that although obstetricians fear litigation and that this fear might be one of the reasons for rising CS rates, there appears to be a lack of documentation of procedures and processes in the private sector.

In the audit by Tshibangu et al, the patients' choices contributed 5.4% of the indications for CS, while in the present audit maternal request for CS constituted 8.7% of the elective CS, a figure 1.5 times higher.[4] This might reflect the rising trend in recent years for women to request CS. The figure in the present audit is more in keeping with the UK figure of 7%, and may also be indicative of the socio-economic groups (middle and high) which attended the audited private practice.

In the present audit, eight out of 10 HIV-positive patients had elective CS, while the other two had emergency CS because of their positive status. This group comprised 7.3% of all elective CS and 3.8% of the total number of CS done, and is much higher than the figures reported by Tshibangu et al.[4] The probable reasons for this difference may be

the variance in the time periods in which the studies were done and the different population groups studied. It is also possible that these figures are lower than what one would expect, given that KwaZulu-Natal is known to have the highest prevalence rates of HIV in South Africa. However, HIV is known to affect mainly the poor socio-economic groups and is a disease of poverty.

There are robust data available to show that elective CS is of value in decreasing the mother-to-child transmission (MTCT) of HIV.[8] However, its value in decreasing MTCT in patients with undetectable viral loads is debatable. There are some authors who believe that viral loads in blood do not correlate with the levels in genital tract secretions in the vagina, and therefore the dangers of vaginal delivery remain. Further randomised studies are required to settle this matter before recommendations can be made in respect of the mode of delivery in women with undetectable viral loads.[8]

In the audit by Tshibangu et al., 21.2% of the elective CS were done as the doctor's choice, the second most common reason given for elective CS.[4] The authors described this as a "new and non-classic indication" and provide several reasons, including convenience, financial incentive, absence of skilled midwives in labour wards and refusal of doctors to attend deliveries over weekends and/or on holidays. These indications are very contentious and are so vague that they may be difficult to confirm in any audit, particularly given the lack of proper records. Similar contentious indications include tubal ligation and medical conditions such as diabetes. These are not standard obstetric indications for CS. The present audit did not include tubal ligation as an indication for CS, but included CPD as an indication for elective CS. This is a questionable indication, although this private specialist practice based its diagnosis on clinical grounds (high head, big baby and unfavourable cervix) in the antenatal period. Most clinicians would argue that the diagnosis of CPD can only be made in labour. However, in a study done by O'Leary et al that evaluated trends in the mode of delivery in Western Australia from 1984 to 2003, a diagnosis of CPD was associated with a 48% chance of elective CS and a 46% chance of emergency CS.[9] Information such as this may influence doctors in private practice to resort to CS when in fear of litigation.

A national audit conducted in the UK has shown that maternal request (7%) is now the fifth most common reason given for performing a CS, after fetal compromise (22%), "failure to progress" (20%), repeat CS (14%), and breech presentation (11%).[10] In the present audit, a similar rate of 8.26% (9/109) was found for CS on request, and this was the third commonest indication for elective CS, after previous CS x 1 at 46.8% (51/109) and previous CS x 2 at 11.9% (13/109). Fetal distress was significantly lower, at a rate of 9.1%, while repeat CS was more than three times the rate in the UK, constituting 46.8% (51/109) of the elective CS.

The difference in rates for fetal distress between South Africa and the UK probably lies in the diagnosis. It is well known that CTG abnormalities lead to an over-diagnosis of fetal distress. The most accurate parameter of intrauterine fetal hypoxia is a "PH sample" of the fetal scalp blood. This practice has fallen away in South Africa, mainly due to the high HIV rates, a lack of appropriate equipment in public sector hospitals and a lack of the necessary skills to obtain fetal scalp blood samples, both in the private and public sectors. In the absence of such methods, the diagnosis of fetal distress should take into account other factors, such as the type of CTG abnormalities, the presence of meconium, whether there is IUGR, the ability to perform intense fetal monitoring and the background obstetric history of the patient.

Similarly, failure to progress may be targeted as an indication for conservative measures prior to a decision for CS. Proper and skilled pelvic examination to exclude CPD and the subsequent judicious use of oxytocin to augment labour may reduce the need for CS without affecting fetal outcome.

Doctors in private practice may be reluctant to resort to conservative measures, fearing litigation and being cautious in respect of the lack of intense fetal and maternal monitoring when oxytocin is used, and fearing uterine hyperstimulation and subsequent fetal distress. Doctors may also be wary of the lack of nursing staff to attend to high-risk pregnancies in respect of maintaining continuous fetal heart monitoring, the inability of nurses to interpret subtle cardiotocographic changes and their own ability to attend to an unexpected emergency, particularly if they are in a single practice. The abovementioned factors probably also apply when VBAC is considered.

Previous CS is the single most common indication for elective CS worldwide, and offering VBAC is one way of reducing high CS rates. However, rates of VBAC are declining in the USA, from 28.3% in 1996 to 12.7% in 2002. This is in contrast to the UK, were the rates of VBAC remain fairly high at 33%.[11] While the risks for maternal and perinatal morbidity and mortality are reported to be relatively low,[12] there are contrasting views. McMahon et al found higher rates of maternal and fetal morbidity in those choosing VBAC in comparison to those who opted for elective CS.[13] This publication in a major journal is probably one of the reasons for the declining VBAC rate in the USA. Despite this, the National Institute of International Excellence (NICE) in the UK provides guidelines in which information is shared with all women who have had a previous CS to help them make an informed choice regarding the mode of delivery.[14] Thus, sufficient time should be taken by all doctors to provide efficient counselling. In the present audit, only one record was noted of a CS done for failed VBAC.

Similar to offering VBAC, external cephalic version (ECV) should be offered to all women with breech presentations at 37 weeks' gestation. Five patients in the present audit had elective CS. The Term Breech Trial has certainly had an impact on obstetric practice in respect to elective CS for breech presentations.[15] The policy of the audited practice was to offer ECV to women with breech presentations at 37 weeks as a way to decrease CS rates. However, no documentation could be found on their being offered ECV, or on the success or failure of the procedure. It would appear that doctors in specialist practice may offer ECV but are reluctant to do the procedure, as it is time-consuming, or that they may lack the skills required to perform an ECV. Like most things, if one does not develop the skill during training one is hesitant to carry out the procedure in private practice. The NICE guidelines suggest ECV as an intervention to reduce high CS rates.[14]

High rates of caesarean section

The high rates of CS found in the present audit are probably a reflection of the trend in South Africa. Bateman, a commentator for the South African Medical Journal, reported a CS rate of 65% in the private sector in South Africa in 2004 and pointed out that this was almost double the percentage in the UK and the USA and therefore a real cause for concern. He also reported that the equivalent South African public sector figure was estimated to be between 10 and 20%, which was only marginally

higher than that in several leading first-world public health systems.[16] A major South African medical aid scheme was reported to have a CS percentage of 63% of total deliveries.[16] This is in keeping with our findings.

The question has been raised whether there is an ideal CS rate. The WHO adopted a figure of 15% world wide, based on the CS rates in countries with the lowest perinatal mortality and morbidity. It is likely, however, that CS rates would vary considerably depending on a multitude of factors, such as pre-eclampsia, intrauterine growth restriction, the prevalence of CPD and medical complications in pregnancy, and cultural attitudes towards CS. Althabe et al recently investigated maternal and neonatal morbidity and mortality in 119 countries and found no association between CS rates and maternal and neonatal morbidity in middle- and high-income countries.[17] These authors also suggest that making CS section available for high-risk pregnancies in low-income countries could contribute to improved maternal and neonatal outcomes, whereas a system of care to keep CS rates below 10% would be unlikely to cover their needs. More recently, Villar et al assessed the risks and benefits associated with CS compared with vaginal delivery within the cohort of the 2005 WHO global survey on maternal and perinatal health.[18] They concluded that CS reduces the overall maternal and neonatal risk in breech deliveries and the risk of intrapartum fetal death in cephalic presentations, but increases the risk of severe maternal and neonatal morbidity and mortality in cephalic presentations.

One of the difficulties when trying to reduce CS rates could be the low perinatal and maternal complication rates associated with planned CS. This audit found that there was only one early neonatal death and one infant death, both of which could be regarded as non-preventable. More importantly, there was no perinatal morbidity. The likely reason for this is that most cases were at term. The maternal complication rate was also low, with only a case of wound infection and a secondary PPH. This is in contrast to a public hospital in Durban, where the maternal complications associated with CS were at 14%, which is indicative of the high-risk cases seen in the public sector.[19]

The present audit confirmed that CS rates were high in a private practice in Durban. However, the audit did have a few shortcomings in that it was unable to determine the actual number of VBACs or ECVs that were successful. There was only one record of a failed VBAC. An audit of all patient records (antenatal and labour, rather than just the patients who had CS) may have provided a more complete picture.

Conclusion

While it is undeniable that planned CS at maternal request and in the case of breech delivery and HIV have contributed to rising CS rates in this private practice, the major contributor was elective CS for patients with a previous CS. This suggests that, in order to curb rising CS rates, careful thought should be given to the outcome of future pregnancies when making the decision to perform a primary Caesarean section. Auditing of CS rates in the private sector may provide specialists with information that will influence the way they practice. Setting aside more time for counselling patients on VBAC and ECV may help bring down high Caesarean section rates in the private health sector in South Africa.

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