Best Practice & Research Clinical Obstetrics & Gynaecology
Vol. 15, No. 1, pp. 1–15, 2001
doi:10.1053/beog.2000.0146, available online at http://www.idealibrary.com on IDEAL®

BEST PRACTICE & RESEARCH

1

Indications for caesarean section

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Caesarean section rates are rising. Caesarean section confers an increase in maternal mortality and morbidity as well as having considerable financial implications. Caesarean section is usually justified by the assumed benefit for the fetus. These benefits are often unquantified and based on scanty evidence. The changing trends in the rates of caesarean section for various indications may be explained partly by improved anaesthetic and neonatal techniques. Cultural changes and expectations in the general population and obstetricians' fear of litigation may have made the changing rate and indications for caesarean section seem more acceptable. There is little research evidence in this area. The evidence that caesarean section is the optimal mode of delivery for various major indications is critically examined. The obstetrician is under an obligation to share the evidence that caesarean section is the optimum mode of delivery with the pregnant woman and her birth attendants to allow the woman to make wise decisions about her management.

Key words: caesarean section; indications.

Human labour is a difficult process. Evolutionary developments have led to an erect posture and to the higher brain capacity that may have facilitated the development of that most unique of human characteristics: language. Arguably, the development of language has led humans to be one of the most successful animals that has ever lived. Although being able to run quickly and think fast are both advantageous qualities, they may produce obvious conflict at the time of birth: babies with large heads have to traverse the narrow human pelvis in order to be born.[1] This cephalo-pelvic conflict may lead to maternal and fetal morbidity and mortality. In rural Africa, the lifetime risk of maternal mortality may be as high as 1 in 15. In addition, the perinatal mortality may be as high as 100 per 1000 total births. It has been said that, for the fetus, the process of labour is the most hazardous journey ever undertaken.

As the operation of caesarean section, with its attendant risks of anaesthesia, has become safer in the 20th century, so the rates of caesarean section have risen. Initially at least, it was its potential for reducing maternal morbidity and mortality that led to its increasing use, but by the late 1950s its apparent advantages to the fetus of bypassing the birth canal became ever more seductive.

1521–6934/01/010001+15 $35.00/00

Currently, in the developed world, approximately 30% of caesarean sections are repeat caesarean sections after primary caesarean section, 30% are performed for dystocia, 11% are performed for breech presentation and 10% are performed for fetal distress.[2,3] In some South American countries section rates are said to be as high as 80%.[4] Belizan et al[5] demonstrated that the caesarean section rates are directly related to the Gross National Product per capita, with the richest countries having the highest caesarean section rates. Thus the determinants of the caesarean section rate are likely to be extremely complex and will include financial imperatives as well as characteristics of the birth attendant and the social and cultural attitudes of women and the societies in which they live. However, international comparisons are of great interest because the rates for different indications vary as widely as the total caesarean section rate.

Often the degree of benefit that the caesarean section confers on the infant is small, or indeed not reliably quantified at all and yet the practice of caesarean section for a particular indication has become well established. Moreover, in many studies of the optimum mode of delivery, it is striking that the degree of risk that the procedure of caesarean section confers upon the mother is often not quantified at all. Yet the maternal mortality for emergency caesarean section is known to be increased four- to fivefold when compared with vaginal delivery. Additionally, the overall increase in caesarean sections has created a subset of pregnant women: those with a previous caesarean section scar. Approximately 11% of pregnant women in the USA have had a previous caesarean section.[2] It has also become apparent that there is an increased risk of placenta praevia and placenta accreta in subsequent pregnancy[6] and the risk of hysterectomy may be as high as 1 in 700 for repeat caesarean sections.[7] It is known that women are prepared to take on a considerable additional risk to their own life and health in the interests of their fetus. It behoves us then, as health professionals, to be careful to identify what we know and what we do not know about the advantages of caesarean section for the fetus in certain clinical situations. Only then will women be able to exercise informed choice about their options for birth.

The phenomenon of caesarean sections performed for maternal choice alone, in the absence of any obstetric, medical or fetal indication, merely highlights the fact that the indications for caesarean section have become increasingly relaxed and are nearly all relative (with some obvious exceptions). With this in mind, we intend to discuss the evidence that caesarean section is the optimum mode of delivery for a variety of indications and the possible reasons for variation in the rates for these indications.

CAESAREAN SECTION FOR DIFFICULT LABOUR OR DYSTOCIA

In the developed world the increasing caesarean section rate for dystocia or poor progress in labour contributes at least a third to the overall caesarean section rate, and repeat caesarean section following primary caesarean section contributes at least another third.

Dystocia is diagnosed when the rate of cervical dilatation in the active phase of labour is slower than the mean, median or slowest 10th centile according to the policy of the unit. The use of partograms as a simple tool for the early diagnosis and management of prolonged labour and sequelae was introduced by the World Health Organization.[8] Poor progress in labour does not identify the specific cause, which may include poor uterine activity or absolute or relative disproportion.

In practical terms, after the diagnosis of poor progress in labour is made, the first action that should be taken is to optimize uterine activity. This is usually done by

performing amniotomy and administering oxytocin. Proponents of active management of labour maintain that a package of strict criteria for the diagnosis of the onset of labour, early amniotomy, early use of oxytocin and continuous professional support will enhance optimal progress in labour and hence normal delivery.[9] Proponents also claim that it has lowered the incidence of prolonged labour and the rate of caesarean sections and instrumental deliveries without compromising the outcome for the neonate. Nevertheless, despite the introduction of active management of labour in many centres the caesarean section rate is still rising and the rate of consumer dissatisfaction with this very interventionist approach may be high.

If uterine activity has been optimized, as above, and labour is still difficult, then mechanical factors may be implicated. There may be absolute cephalopelvic disproportion or relative cephalopelvic disproportion due to malposition of the head.

Some relative malpositions may be managed by assisted vaginal delivery if full dilation has been achieved, but many women will require caesarean section to achieve delivery. Women presenting in the second stage with a brow presentation, mento-anterior face presentations and occipitolateral or occipitoposterior positions may be suitable for assisted vaginal delivery as a trial in the operating theatre.[10] However, caesarean section may be preferable to a difficult instrumental delivery.

It is clear that, with widely differing caesarean section rates for difficult labour, there are many unknown variables that may cause this variation in practice. It is not known whether these variables are woman-related (e.g. intolerance of difficult birth) or clinician-related (e.g. fear of litigation).

CAESAREAN SECTION FOR FETAL DISTRESS

Fetal distress is a poorly defined term. Current methods of assessing the condition of the fetus in labour are poorly predictive of those who are genuinely compromised, and end-point assessment of the neonatal condition by Apgar scores or umbilical blood gas data is poorly predictive of long-term neurodevelopment.

The introduction of continuous electronic fetal monitoring (EFM) has been suggested as a cause of the rising caesarean section rate for fetal distress. There are now 12 randomized trials comparing EFM with intermittent auscultation. Meta-analysis has shown an increase in the caesarean section rate associated with EFM and no significant reduction in the overall perinatal mortality rate. However, a significant reduction was seen in deaths attributed to hypoxia and a reduction in neonatal seizures in the group who had EFM.[11,12]

Access to fetal blood sampling may reduce the rate of unnecessary caesarean sections for abnormal fetal heart rate patterns. Newer methods, such as fetal ECG waveform analysis and computerized CTG, may contribute to a further reduction in the future.[13]

CAESAREAN SECTION FOR PREVIOUS CAESAREAN SECTION

One of the most common indications for caesarean section is repeat caesarean section.[2] When the most common caesarean section was the 'classical caesarean section', clinicians feared scar rupture in labour, and repeat caesarean section was considered mandatory for all subsequent births. However, it rapidly became clear that lower segment caesarean section was not associated with disastrous ruptures and the concept of 'trial of scar' in subsequent deliveries became current. (See Chapter 5.)

There is a plethora of studies describing safe vaginal birth after caesarean section. The published data would suggest a scar dehiscence rate of less than 1% for women undergoing an attempted vaginal delivery.[14,15] Moreover, Enkin[16] analysed a series involving 8899 women who were permitted a trial of labour; of these, 20.1% were delivered by caesarean section again and 79.9% were delivered vaginally. Why, if the chances of success are so high and the morbidity is so low does the percentage of women delivering vaginally after previous caesarean section in practice remain low? In 1993, the percentage of women delivering vaginally after a caesarean section in the USA was only 25.4%.[6]

The reluctance to permit a trial of labour after previous caesarean section is probably due to a variety of reasons. First, maternal preference is likely to play a large part, with caesarean section being regarded as a safe and convenient procedure. Second, the clinician is also likely to regard the procedure of caesarean section as routine, safe and convenient, and certainly less likely to give rise to the complication of scar dehiscence and possible subsequent litigation.[17] There is little work currently available examining the reasons for the clinician's or mother's choice in this area.

CAESAREAN SECTION FOR BREECH PRESENTATION

The role of caesarean section for the delivery of the breech remains unresolved although in some countries the caesarean section rate for breech presentation is now of the order of 80%. The results of a large randomized controlled trial are still awaited.[18] Estimates of risk to the neonate of vaginal breech delivery vary from 0 to 35 per 1000 deliveries.[19]

The body of literature that informs this move towards caesarean section provides little support for the view that caesarean section improves the outcome for the baby. What evidence there is is mostly large retrospective reviews of practice. There are only two randomized controlled trials that did not show any reduction in perinatal mortality, but the trials were far too small to provide any definitive results.[20,21] There are two reviews or meta-analyses of suitable cases.[22,23] These compared planned elective caesarean with planned vaginal delivery with respect to infant outcome. The results suggested that the risk of perinatal death associated with vaginal delivery may be two to five times higher than that associated with a planned caesarean section after excluding babies with lethal congenital abnormalities.

In contrast, the randomized trials[20,21] did show 'striking and concerning differences in maternal outcome'.

The optimal caesarean section rate for the delivery of the term breech may be between 30 and 60%[24], but it is clear that with variations as wide as this that maternal preference has a large part to play. It is currently not known how much the mother's or physician's preference affects rates of caesarean section.

CAESAREAN SECTION FOR THE DELIVERY OF THE PREMATURE FETUS

Premature breech presentation

The antecedents of premature breech delivery are often morbid, in common with all premature births. It is often this rather than the mode of delivery that confers additional risk on the pre-term breech baby. In addition, the premature breech has a

higher incidence of congenital abnormalities (up to 18% in some series[25]). The choice of mode of delivery is often dictated by other clinical circumstances, such as placental abruption or severe pre-eclampsia rather than the presentation.

The mortality of breech babies delivered between 33 and 36 weeks' gestation is often very low and is not significantly affected by the mode of delivery. It is the 2% of deliveries in the gestation range 26 to 32 weeks that are the most challenging.

If the clinical situation is that of the uncomplicated premature breech in labour, and the condition of the fetus and mother is good, the decision about whether to allow a trial of vaginal delivery or to undertake a caesarean section is most difficult. There have been four randomized controlled trials of the mode of delivery of the pre-term breech undertaken. Of these, only one was completed, and none was large enough to draw any definite conclusions.[26–29]

Premature cephalic presentation

Mode of delivery has not been shown to affect neonatal outcome significantly in live born infants between 24 and 28 weeks with a cephalic presentation at delivery.[30] In infants below 26 weeks or below 800 grams, however, caesarean section for fetal distress is associated with an increased chance of intact survival, but also survival with significant morbidity.[31]

At gestations less than 26 weeks, the woman and the obstetrician should be aware of the impact of intervention and consider the possibility of serious morbidity and mortality when deciding the mode of delivery.[31]

ANTEPARTUM HAEMORRHAGE

Placental abruption

In the presence of major placental abruption, even when the fetus is alive at presentation, the outlook for the fetus is poor. In non-randomized trials, higher perinatal mortality rates have been described for vaginal delivery when compared to caesarean section (Okonofua and Olatubosum 52% versus 16%[32] and Hurd et al 20% versus 15%[33]). Other retrospective studies have demonstrated only a small advantage[34] or no advantage at all[33] for the fetus delivered by caesarean section.

In less severe placental abruption it is necessary to consider other factors such as the presence of fetal distress, the state of the cervix and the presence of other obstetric complications. Continuous fetal monitoring is mandatory if vaginal delivery is to be attempted, in order to minimize perinatal mortality.[32]

In the least severe cases, in a pre-term pregnancy, a policy of conservative management may be indicated to achieve fetal lung maturation prior to delivery.[35]

Placenta praevia

Diagnosis of placenta praevia is usually an indication for delivery by caesarean section. However if the praevia is of a minor degree (types I–II) and the fetal head is engaged, trial of vaginal delivery may be attempted. If vaginal delivery is contemplated as an elective procedure an examination and amniotomy can be performed in the operating theatre with all personnel and facilities available for immediate recourse to caesarean section. Caesarean section is the recommended mode of delivery in major placenta praevia (types III–IV).

Vasa praevia

Vasa praevia is a rare condition that carries a high fetal mortality due to fetal exsanguination resulting from tearing of the fetal vessels when they lie within the membranes. Transvaginal ultrasonography and colour Doppler may be used for diagnosis of vasa praevia, and elective caesarean section is recommended for these cases.[36,37]

CAESAREAN SECTION FOR THE DELIVERY OF TWINS

The optimum mode of delivery of twins remains controversial. Much will depend on the chorionicity of the pregnancy, the presence of additional fetal or maternal complications, gestation at delivery and the ultimate presentation of both twins when the time for delivery is reached or at the onset of labour. The incidence of multiple pregnancy is rising due to increasing maternal age[38] and the impact of assisted conception, and the need for good quality evidence about the optimum mode of delivery is therefore increasing.

The available evidence comprises many retrospective comparative studies and many reviews of the intrapartum management of twins but there are few randomized controlled trials on which to base recommendations.

First twin vertex, second twin vertex

This is the most common presentation for twins, and the consensus is that vaginal delivery is appropriate.[39,40]

Although the second twin is at greater risk of morbidity and mortality, a large part of this risk results from discordance in growth that tends to favour the first twin. The difficulties associated with the simultaneous recording of the fetal hearts in labour has led some commentators to suggest that, if an adequate simultaneous fetal heart rate recording cannot be achieved in labour, caesarean section should be performed because of the risk of sudden and unexpected abnormalities in the heart rate of the second twin.[41]

Previous caesarean section should not be regarded as an absolute contraindication to vaginal delivery in twin gestation[42] although previous classical caesarean section, uterine rupture or other obstetric contraindication to labour must be considered.

First twin vertex, second twin non-vertex

The only randomized controlled trial of the mode of delivery of twins[43] found no difference in neonatal outcome in 60 non-vertex second twins at, 35 weeks or more, who were randomized to either vaginal delivery or caesarean section. Some authors still recommend caesarean section[39,44], finding that the neonatal mortality and morbidity for the second twin is lower.

Many authors have suggested that there is no excess risk if the non-vertex second twin is either delivered by the breech after an internal podalic version or delivered by the vertex after an external cephalic version.[45–50] Occasionally, however, the second twin is significantly larger than the first and then great care must be exercised in attempting delivery of the non-vertex second twin, especially if non-vertex.

Non-vertex first twin

Delivery by caesarean section is often advised in this case[40], although there is little published evidence to support this view. The great fear is of locked chins or heads (twin entrapment) resulting in death of the first twin and of hypoxia in both twins.

Low-birthweight twins

Where the presentation is vertex–vertex, and even if the birth weights are thought to be less than 1500 g, the literature supports vaginal delivery.[40,51]

For the non-vertex second twin of very low birthweight (< 1500 g) the situation is more controversial and the risk–benefit ratio between the mother and the baby is difficult to judge. Pre-term caesarean section carries considerable morbidity for the mother. Some reports advocate caesarean delivery to minimize birth trauma.[40,45,47,48] Other authors fail to show any benefit to the neonate.[52]

Monoamniotic twins

Monoamniotic twin pregnancies are particularly associated with twin entrapment at delivery, cord entanglement and twin–twin transfusion. The diagnosis is now possible using ultrasound at early gestations.

Although it has been suggested that, if both twins are cephalic, with no evidence of significant cord entanglement, and there are no other contraindications, vaginal delivery may be attempted[53], it is conventional to advocate routine elective caesarean section in all cases at the point when fetal lung maturity is thought to be adequate.

Caesarean section for triplets and higher order births

Over 90% of triplet births are by caesarean section.[54] caesarean section is said to reduce the incidence of low Apgar scores at delivery and decrease the incidence of perinatal death.[55,56]

It is known that caesarean section rates for all types of twins and higher multiples are rising. In view of the fact that increasing numbers of these births are to older mothers and those who have undergone assisted conception, it is possible that the anxiety of parents and clinicians about neonatal outcome may play a large part in the ultimate decision about the mode of delivery rather than the objective evidence outlined above.

CAESAREAN SECTION FOR CORD PROLAPSE

Mortality from this complication has been falling, whatever the mode of delivery, over recent years from 430 per 1000 to 55 per 1000.[57]

Generally, prompt caesarean section is urged[57], although the interval from prolapse to delivery is not the only determinant of outcome for the neonate.[58] However, some 20–30% of cases of cord prolapse present when the cervix is fully dilated and the head is at or below the spines, and then immediate delivery with forceps may be possible.

MATERNAL CONDITIONS

Caesarean section has been advocated for various maternal diseases. It has been traditional to advocate caesarean section for congenital or acquired cardiac disease, but current evidence favours vaginal delivery, especially in the presence of maternal pulmonary vascular disease where operative delivery significantly worsens the prognosis.[59–61]

Maternal diabetes in pregnancy has been associated with increased rates of caesarean section, partly in an effort to reduce the rate of unexpected intrauterine death at term and fetal trauma associated with fetal macrosomia. The place of elective caesarean section remains controversial.[62]

Other maternal diseases, such as idiopathic thrombocytopenic purpura (ITP) and obstetric cholestasis, are associated with increased rates of caesarean section to avoid fetal morbidity and mortality, but there is scant evidence to support this practice.[63–65]

Similarly, in pre-eclampsia there is a higher risk of caesarean section, with some authors describing caesarean section rates of over 80% in gestations below 30 weeks.[66] Even at pre-term gestation, however, vaginal delivery is possible.

If ovarian and cervical malignancy complicates pregnancy, caesarean section is often performed to facilitate definitive treatment.[67–72]

FETAL CONDITIONS

Fetal macrosomia

Fetal macrosomia (from any cause) carries an increased fetal and maternal morbidity. Systematic review has not shown induction of labour for fetal macrosomia to be of benefit in non-diabetic women.[73] Induction of labour in women with suspected macrosomia did not affect the risk of caesarean section or instrumental delivery.[73] It has been suggested that a policy of prophylactic caesarean section in babies with an estimated fetal weight of 4000–4500 g would require more than 1000 caesarean deliveries to avoid a single case of brachial nerve damage.[74] Optimization of the management of shoulder dystocia may be a more tenable approach to the prevention of birth trauma.[74] Wagner et al suggested that the judicious use of caesarean section in diabetic patients with expected macrosomic babies would reduce risk of shoulder dystocia, but recommended a trial of labour in the non-diabetic women with suspected fetal macrosomia, as prediction of fetal weight in this group is difficult.[75] A population-based study has shown that most macrosomic babies (over 4000 g) are delivered vaginally with low rates of maternal and fetal complications. Macrosomic babies were, however, found to have a higher rate of Erb's palsy but similar rates of other serious complications of shoulder dystocia, when compared with normal weight babies.[76] Numerous studies have shown that fetal weight estimation and actual birth weight are of limited value in predicting neonatal brachial plexus injury, and the rates of long-term morbidity do not justify elective caesarean delivery in infants weighing less than 5000 g and without other complications. Caesarean section is recommended for babies with an estimated fetal weight greater than 5000 g, particularly in nulliparous women.[77–81] Induction of labour in non-diabetic mothers with macrosomic babies has not been shown to be of any value[82] and increases the rate of caesarean section.[83,84]

The present evidence, therefore, suggests that elective caesarean section is not justified for macrosomia alone, in the absence of other complications, in diabetic or non-diabetic mothers, unless the estimated fetal weight is over 5000 g.

Transverse lie

If diagnosed antenatally, the cause of the abnormal lie should be investigated as this may affect management. If no such cause is found, vaginal delivery may be attempted. No randomized trials exist to aid the management of these women.

In late pregnancy, if spontaneous version to longitudinal lie does not occur, external version may be attempted, with or without stabilizing induction. If abnormal lie persists despite these measures, strong consideration should be given to elective caesarean section. High rates of caesarean section and fetal morbidity have been described with expectant management if external version is not successful.[85]

If the abnormal lie is detected in labour, external version may still be possible. Phelan et al have shown a 50% reduction in the caesarean section rate when this was attempted in labour, using tocolysis and ultrasound.[86]

Fetal anomalies

A variety of congenital conditions are associated with high caesarean section rates. While there are many retrospective reviews of practice examining the optimal mode of delivery there are no randomized controlled trials on which to base recommendations, and the literature, in the main, is very confusing.

Many congenital defects are associated with additional defects which dictate that prognosis is poor. For example, fetal ventriculomegaly in association with other brain defects (such as alobar holoprosencephaly) usually has a poor outcome and, in the main, vaginal delivery, with cephalocentesis if required, is advocated. Even with isolated ventriculomegaly, however, there is no evidence that caesarean section is necessary[87,88] but there is no randomized controlled trial addressing this issue.

Similarly, in other more common conditions affecting the fetus, such as fetal myelomeningocele, fetal anterior wall defects, fetal hypoplastic left heart syndrome or non-immune hydrops, there are no randomized controlled trials to aid decision making, and the literature is contradictory.[87,89–96] In many cases the decision about mode of delivery and the high rates of caesarean section for fetal disease are dictated by the necessity for highly skilled paediatric assistance at the time of birth and the timing of reconstructive surgery in the newborn period. It is these logistic considerations that often mandate caesarean section rather than convincing evidence that the fetus fares better after caesarean section.

MATERNAL REQUEST

Caesarean section for maternal request in the absence any obstetric indication is on the increase. Performing a caesarean section when it is not clinically indicated has traditionally been considered inappropriate, but views may be changing. Evidence supporting increased rates of maternal complications for elective caesarean performed under regional anaesthesia with appropriate antibiotic cover and thromboprophylaxis is poor. In the recent confidential enquiry into maternal deaths, there were 45 direct maternal deaths following caesarean section, although many were probably due to

pre-existing disease. Long-term pelvic floor damage has been associated with vaginal delivery, especially instrumental delivery.[97–99] Intrapartum fetal safety may also be a factor for the woman choosing a caesarean delivery. The exact risk of labour to the fetus is not known but a normal baby weighing over 1500 g at birth is estimated to have a risk of death of 1 in 1500 in the UK[100] and, additionally, 1 in 1750 labours results in hypoxic ischaemic encephalopathy.[101] Some 31% of London obstetricians with an uncomplicated singleton pregnancy at term would choose an elective caesarean section for themselves.[102]

Having an elective caesarean section may be associated with higher socioeconomic status in certain cultures, such as in Latin America[5], or may reflect an increase in involvement of the woman in decision-making by providing a choice of mode and timing of delivery.[103,104]

No randomized studies have been carried out in this area and, until they are, women should be counselled about risks and benefits of a caesarean delivery based on our present best knowledge.

SUMMARY

Human labour is a difficult process, and the cephalo-pelvic conflict consequent upon trying to deliver a large brain through a small pelvis may lead to maternal and fetal morbidity and mortality. Caesarean section circumvents the birth canal and may avoid some of the consequences of difficult birth.

Rates of caesarean section are rising, however, and the rates for various indications vary widely. Currently the major indications are repeat caesarean section, dystocia, breech presentation and fetal distress.

The risks to the mother of caesarean section are frequently unquantified but are usually justified in terms of the benefit to the fetus. The scale of this fetal benefit is usually also unquantified, and recommendation for a caesarean section is not evidence-based in many instances.

Variations in the rates of caesarean section for dystocia or difficult labour are difficult to explain, even in the context of the active management of labour, and the impact of electronic fetal monitoring and fetal blood sampling on the use of caesarean section for fetal distress is similarly difficult to ascertain. The place of caesarean section in the management of twins, premature delivery, breech presentation or maternal and fetal disease has rarely been subjected to randomized controlled trial, but even where

Practice points

- at the present time, with a very few exceptions, most indications for caesarean section are relative
- caesarean section is associated with higher maternal mortality and morbidity with generally unquantified benefit for the fetus
- so far there is no good evidence that caesarean section is the optimum mode of delivery in breech presentation, twins, previous caesarean section, most maternal medical conditions or in the presence of most fetal anomalies
- when indications for caesarean section are relative, the woman and her family should be closely involved with any decisions regarding mode of delivery

Research agenda

- studies should address the optimum mode of delivery in breech presentation and multiple pregnancies
- the reasons for changing attitudes of women and their clinicians towards caesarean section should be explored
- the risks of elective caesarean section to the mother need to be quantified more accurately
- the risks and benefits of caesarean section to the neonate need to be accurately quantified

the place of a trial of vaginal birth has been clearly demonstrated, such as after previous caesarean section, the number of women even attempting to deliver vaginally is small.

Clearly, determinants of the rates of caesarean section lie in the attitudes of obstetricians, midwives, the women and their families, and little work is available systematically examining these variables. Nowhere is this more starkly demonstrated than in the rising rates of caesarean section at maternal request alone, without medical indication, that are being seen in the developed world.

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