Caesarean section

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Caesarean section has become a frequently performed surgical procedure with 22% (11 891/53 805) of New Zealand mothers giving birth by Caesarean section in 2001.[1] Although it has become much safer over time, Caesarean section continues to have short and long-term risks for the mother and risks for the foetus especially when performed electively. There is ongoing debate among those who believe it is performed too frequently with little benefit and those who believe it is the safest way to give birth and support women's choice to deliver by Caesarean section when there is no medical indication.

Caesarean section rates are continuing to rise in most developed countries.[2] The reasons for the increasing rates are complex. There are variations between institutions and populations but overall national rates and trends over time have been similar, with the notable exception of the Nordic countries.

By comparison, operative vaginal delivery rates have remained relatively constant since the mid-1970s. There has been a move away from the use of forceps to using ventouse for operative vaginal delivery. Initiatives in the USA and Canada have focused on the principal indications for Caesarean section, dystocia, foetal distress and repeat Caesarean section and may have contributed to the stabilisation of Caesarean section rates in those countries.[3] Other important factors include women's choices about childbirth and the characteristics and views of obstetricians.

There has been discussion in New Zealand about the rights of women to request an elective Caesarean section when there is no medical indication

Demographic changes have contributed to the rising trend, with women having children later and also decreasing family size. Caesarean section rates vary with factors such as maternal age and parity. The rate of Caesarean section increases with maternal age.[2,5]

Demographic factors however, only explain some of the variation in Caesarean section rates between institutions. Differences in clinical practice are also influential. There is a shift in obstetric culture towards a lower threshold for performing Caesarean section.

Maternal request is said to have contributed to the increasing Caesarean section rate. Studies in Australia, Eire, Sweden and the UK have shown rates varying from 1.5 to 28%, although this wide range is in part due to the diversity of definitions in the studies.[2] The International Federation of Gynecology and Obstetrics (FIGO) has reviewed maternal request as an indication for Caesarean section and concluded that, because no net benefit exists, performing a Caesarean section for non-medical reasons is not justified.[6]

There has been discussion in New Zealand about the rights of women to request an elective Caesarean section when there is no medical indication. This is mainly relevant to primigravid women with a cephalic presentation at term. Although a trial of vaginal delivery following one previous Caesarean section is an option, with up to 75% of women achieving a vaginal delivery, most

Table 1. International Caesarean section rates

Country	Year	Caesarean rate (%)
England	2000	21.3
Wales	2000	24.2
Northern Ireland	2000/01	23.9
Scotland	1999	19.3
USA	1999	22
Australia	2001	22
New Zealand	2001	22
Denmark	1999	13.7
Norway	1999	12.6
Sweden	1999	12.2
France	1999	17.5
Italy	1999	22.5

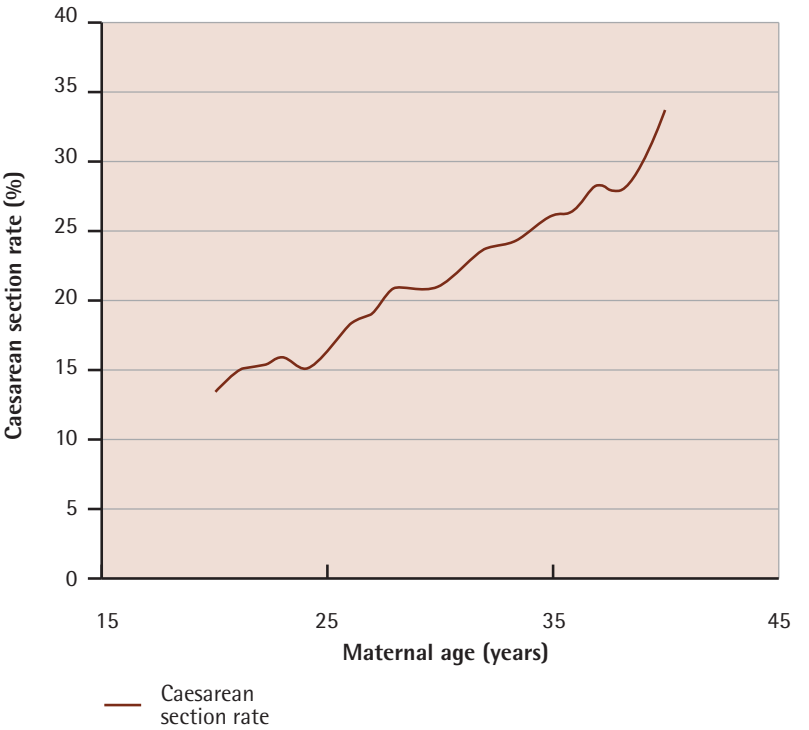
Sources: The National Sentinel Caesarean Section Audit,[2] Report on Maternity[1]

obstetricians have supported women who elect to have a subsequent Caesarean section.[11] A legal opinion has been sought on elective Caesareans without medical justification. The opinion stated that, *'in the absence of any clinical reasons rendering Caesarean delivery the preferred delivery method, it is our view that doctors and District Health Boards are entitled to and should decline to perform this procedure in favour of natural birthing options'*.[4] This is an unresolved issue and the amount of media attention generated by this opinion supports the fact that this is an ongoing issue that is likely to become more important with time.

An elective Caesarean section is one that is planned and usually performed before labour. Approximately one-third of all Caesarean sections are performed electively. The advantages include that it is a planned procedure with less maternal risk than is associated with emergency procedures. The most frequent indication for an elective Caesarean section is one or more previous Caesarean sections. For primigravid women, the most common indication is breech presentation. The decision to perform an elective Caesarean section is usually based on a number of factors relating to the maternal history and factors in the current and previous pregnancies. Some indications are relative and others, for example placenta praevia, are absolute. The woman's wishes and expectations are an important part of the decision.

An emergency Caesarean section is usually performed in labour with the most common indications being suspected foetal compromise and failure to progress. There is often a combination of factors that contribute to the decision to perform a Caesarean section. Approximately two-thirds of all Caesarean sections are emergency procedures.

Figure 1. Caesarean section rate by maternal age



Source: The National Sentinel Caesarean Section Audit Report[2]

There is a shift in obstetric culture towards a lower threshold for performing Caesarean section

For many years, New Zealand obstetricians have sought a perinatal database that could report detailed data on all deliveries and be used to monitor clinical outcomes. There have been major changes to the way we deliver maternity services but there is little information on outcomes over time. By comparison there have been excellent Australian databases for several years. The New Zealand Ministry of Health has published a report on maternity for 2000 and 2001 but there are major limitations in this report in terms of data quality. The most important limitation is that the data is from only 70% of all births.[1]

The Royal College of Obstetricians and Gynaecologists (RCOG) performed a detailed audit of all Caesarean sections performed in a three-month period.[2] It is likely that their results are comparable to New Zealand. The Caesarean section rate for England and Wales was 24% for primigravid women, 10% for multiparous women who had not had a previous Caesarean section and 67% for multiparous women who had had at least one previous Caesarean section. In this audit 37% of Caesarean sections were classified as elective, 63% were emergency procedures. For primigravid women the most common indications were failure to progress, presumed foetal compromise, breech presentation and maternal request (as reported by physicians). Of the repeat Caesarean sections undertaken the majority (70%) were elective procedures. The main indications were previous Caesarean section and maternal request. The majority of pregnant women have a single baby, born head first at term. The Caesarean section rate in this group was 17% but, as the largest

clinical group in the population, it contributed 70% to the overall rate. The primary Caesarean section rate was 12% and the repeat Caesarean section rate was 64%, contributing 46% and 24% respectively to the overall rate. For breech presentations, the overall Caesarean section rate was 88% representing 16% of the overall Caesarean section rate; 56% were elective and 44% were emergency operations. Fifty-nine per cent of twin pregnancies were delivered by Caesarean section representing 14% of the overall Caesarean section rate. Caesarean section reported by clinicians to be primarily performed for maternal request contributed 7% of the overall Caesarean section rate.

The main indication for an elective Caesarean section in a woman having her first baby is breech presentation. Most obstetricians now advise Caesarean section in all cases of breech presentation.[8] The term breech trial confirmed the safety of Caesarean section in this group.[7] Randomisation to the vaginal breech group of the trial was associated with a significantly higher risk of perinatal death and severe perinatal morbidity. The authors estimated that in countries with a low perinatal mortality, with a policy of planned elective Caesarean section for breech, only seven extra Caesarean sections would need to be performed to prevent a perinatal death or baby with severe perinatal morbidity.[8] External cephalic version should be considered for all women presenting with a breech presentation near term. Attempting external cephalic version appears to reduce the chance of non-cephalic births and Caesarean section.[9] There is not enough evidence to assess the risks of external cephalic version at term. The success rate is variable and is dependent on factors such as gestational age, the position of the legs, the amount of amniotic fluid, the abdominal wall muscles and uterine tone.

Despite the increasing safety of Caesarean section, significant risks remain. The risk of bleeding and blood transfusion is higher, with an increased risk of infection and re-admission to hospital. The surgical risks of damage to bladder and bowel and adhesion formation are more likely with increasing number of Caesarean sections. Antibiotic prophylaxis reduces the risk of postpartum maternal infections associated with Caesarean section. Deep vein thrombosis and pulmonary embolism are increased and a thromboprophylaxis strategy should be part of the management of all women post Caesarean section. Anaesthetic deaths have been reduced by a number of factors including the increasing use of regional anaesthesia. The majority of Caesarean sections should be performed with regional block. In the RCOG review, the use of regional anaesthesia was an auditable factor. In the review, 77% of emergency and 91% of elective Caesarean sections were under regional anaesthesia. Ten per cent of women who had a Caesarean section required care in addition to routine postoperative care. The majority were in a high dependency area but 3.5% required transfer to an intensive care unit.[2]

Elective Caesarean section should be performed at 39 weeks in order to reduce the risk of respiratory distress

The main risk to babies born by elective Caesarean section is respiratory distress. The risk lessens with increasing gestational age. Routine ultrasound scanning has helped confirm gestational age and reduce the risk of iatrogenic prematurity. However, an ultrasound performed in the first 20 weeks of pregnancy has an error of plus or minus seven days and this can impact on the risk of respiratory distress when a baby is delivered at 37 rather than 38 weeks. Elective Caesarean section should be performed at 39 weeks in order to reduce the risk of respiratory distress.[11] There is also a risk of laceration to the foetus although this is more likely in an emergency Caesarean section when the membranes have ruptured.

There are important risks in a subsequent pregnancy. The risk of scar rupture in a future labour and delivery has been well documented. The risk is estimated at 1:100–200 after one Caesarean section. When rupture does occur it is associated with significant foetal and maternal mortality and morbidity. The risks are reduced with prompt diagnosis and management. Trial of vaginal delivery is considered safe after one Caesarean sec-

Key Points

- The Caesarean section rate is increasing.
- Demographic factors are only part of the reason.
- There is a lower threshold for performing a Caesarean section than in the past.
- Repeat Caesarean section is the main indication for elective Caesarean section and is a major driver of the overall Caesarean section rate.
- Planned Caesarean section is safer for breech presentation.
- Maternal choice is becoming increasingly important in the decision to perform a Caesarean section.
- Caesarean section is safer than ever before but continues to have significant short and long-term risks for the mother. There is also a risk of neonatal respiratory distress with elective Caesarean section.
- It remains unclear whether the pelvic floor is protected in the long-term by elective Caesarean section and if so by what degree.

tion.[12] Although vaginal delivery can occur safely after two Caesarean sections, it is usual practice to perform a Caesarean section after two or more Caesarean sections because of the increased risk of scar rupture and the reduced chance of a vaginal birth. The biggest contribution to overall Caesarean section rate is repeat Caesarean section and the management of women with a previous Caesarean section influences the overall Caesarean section rate.[2]

A more serious risk to the mother is the risk of placenta praevia and placenta percreta. Abnormal penetration of the placenta into and through the myometrium is more common with increasing numbers of Caesarean sections. Placenta percreta can result in massive life threatening haemorrhage and hysterectomy is usually necessary. Placenta percreta has become much more common with the increasing frequency of Caesarean sections.

There is a growing sense in the community that Caesarean section is the safest way to have a baby and that the pelvic floor will be protected. This is not supported by available evidence. Caesarean section is only partially protective against pelvic floor weakness and incontinence. It appears that the most important association is the pregnancy itself. An Australian retrospective review of the prevalence of pelvic floor disorders found that Caesarean delivery was not associated with a significant reduction in long-term pelvic floor morbidity compared to spontaneous vaginal delivery.[10] Vaginal delivery is associated with damage to the pelvic floor. What remains unclear is the degree of protection offered by an elective Caesarean section. The risk of a foetal death or severe birth asphyxia in labour is very low and a very large number of elective Caesarean sections would need to be performed to prevent a single severe outcome.

One of the priorities of maternity care is to enable women to make informed decisions regarding their care and treatment

One of the priorities of maternity care is to enable women to make informed decisions regarding their care and treatment. To do so they require access to evidence-based information to help them in making their decisions. In the RCOG audit, a significant proportion of women reported that they would like more information on the risks and benefits of Caesarean section. It is extremely important to continue to monitor outcomes and support ongoing research. The issue of whether elective Caesarean section does protect the pelvic floor and whether it does so in the long-term needs much more investigation. The long-term risks of Caesarean section have also not been fully investigated.

References

1. Report on Maternity 2000 and 2001; Ministry of Health; New Zealand Health Information Service 2003.
2. The National Sentinel Caesarean Section Audit Report. RCOG Clinical Effectiveness Support Unit 2001.
3. Robson MS, Scudamore IW, Walsh SM. Using the medical audit cycle to reduce Caesarean section rates. Am J Obstet Gynecol 1996; 174:199–205.
4. Meredith Connell. Elective Caesareans without Medical Justification. Letter to Aon Legal Buying Group, September 2002.
5. Rosenthal AN, Paterson-Brown S. Is there an incremental rise in the risk of obstetric intervention with increasing maternal age? Br J Obstet Gynaecol 1998; 105:1064–9.
6. http://www.figo.org/default.asp?id=6018
7. Hannah ME, Hannah WJ, Hewson SA, Hodnett ED, Saigal S, Willan AB. Planned Caesarean section versus planned vaginal birth for breech presentation at term: a randomised multicentre trial. Lancet 2000; 356(9239):1369.
8. Hofmeyr GJ, Hannah ME. Planned Caesarean section for term breech delivery (Cochrane Review) In: The Cochrane Library, Issue 2, 2003. Oxford: Update Software.
9. Hofmeyr GJ, Kulier R. External cephalic version for breech presentation at term (Cochrane Review). In: The Cochrane Library, Issue 2, 2003. Oxford: Update Software.
10. MacLennan AH, Taylor AW, Wilson DH, Wilson D. The prevalence of pelvic floor disorders and their relationship to gender, age and parity and mode of delivery. Br J Obstet Gynaecol 2000; 107(12):1460–70.
11. Morrison JJ, Rennie JM, Milton PJ. Neonatal respiratory morbidity and mode of delivery at term: influence of timing of elective Caesarean section. Br J Obstet Gynaecol 1995; 102(2):101–6.
12. Rosen MG, Dickenson JC. Vaginal birth after caesarean: a meta-analysis of indicators for success. Obstet Gynecol 1990; 76:865–9.