NCT EVIDENCE BASED BRIEFING
Caesarean Section - Part 2

BACKGROUND

Part 1 of this Briefing (***New Digest*** edition 19, August 2002) introduced the reasons why Caesarean sections (CS) are performed, and discussed variations and changes in Caesarean rates, drawing on research and audit evidence. One key point highlighted was that none of the four most common reasons for carrying out a CS is an "absolute indication".Part 2 provides checklists of conditions in which it is widely agreed that a CS is beneficial for the baby, the mother, or for both, and conditions or circumstances in which there is less agreement, or evidence that if services were managed differently considerably fewer operations would need to be performed.

These checklists are followed by a brief, referenced summary of the evidence of benefits and risks of CS for babies and for women.

CHECKLISTS

Conditions in which it is widely agreed that CS is beneficial

- major placenta praevia where the placenta covers or is close to (< 2 cm from) the cervical os (www.rcog.org.uk/guidelines);
- transverse or oblique lie with the membranes ruptured (external cephalic version may be possible if the membranes are intact);
- face presentation with the baby's chin towards the mother's spine;
- persistent brow presentation (good contractions may alter a brow presentation into a vertex or face presentation);
- cord prolapse, particularly before full dilatation;
- uterine rupture;
- eclampsia or severe pre-eclampsia;
- severe placental abruption, if the baby is still alive;
- absolute cephalo-pelvic disproportion, including contracted pelvis and hydrocephalus in the baby;
- breech with neck extended ("star-gazing breech");
- severe fetal distress.

Most of these conditions are listed by Savage (1997).

Conditions & circumstances where there is debate about extent to which CS is performed

- lack of progress in labour/failure to progress (dystocia);
- cephalopelvic disproportion and large babies;
- fetal distress;
- breech;
- previous CS;
- small and growth retarded babies;
- premature babies and twins/triplets;
- medical conditions and disabilities in the mother, including diabetes and heart disease;
- HIV, Hep B or genital herpes in the mother;
- fibroids in the mother;
- poor obstetric history or a "precious baby";
- previous traumatic birth experience;
- maternal perineal or urinary problems;
- maternal request.

BENEFITS & RISKS ASSOCIATED WITH CS FOR THE BABY

There is evidence of health benefit associated with a Caesarean birth for particular groups of babies. There are also known risks for babies associated with a surgical birth. In making a decision, parents, and the health professionals advising them, should feel they can assess the relative benefits and risks in their particular circumstances and decide where the balance of advantages and disadvantages lies for them.

Unfortunately, evidence is usually only available for large populations; it is not possible to know how a particular baby will be affected by a vaginal birth or by a Caesarean. Therefore, the way different parents weigh up the evidence and apply it to themselves will vary. In some cases there is more agreement about the most appropriate kind of management than in others. The skills of the staff in a particular unit may be influential in the balance of risks and benefits. Also, some conditions vary in the extent of their effects and this may influence decision-making.

Benefits

- Small, growth-retarded or compromised babies, who are less able to withstand the stress of labour than healthy babies, tend to have better outcomes with CS (*Expert Advisory Group on Caesarean Section in Scotland, 2001*).
- In breech babies, mortality and the need for resuscitation is reduced by elective CS (Rennie, 1999). Outcomes for babies were better in the elective Caesarean arm of the term breech trial (Hannah et al., 2000). A retrospective study in Norway found that there were significantly decreased risks to the breech baby when born by elective CS (*Belfrage and Gjessing, 2002*).
- Some large babies, particularly those born to diabetic mothers may have better outcomes with CS. Surgery can protect against shoulder dystocia and the consequent brachial plexus injury (which involves nerve damage affecting the arm). A quarter of those affected at birth have poor hand function in adult life (*Rennie, 1999*). However, no risk factors (alone or in combination) are very good at predicting shoulder dystocia and increasing the CS rate does not lead to a decrease in shoulder dystocia (*Calder, 2002*).
- Babies with congenital abnormalities which could cause mechanical obstruction may have better outcomes with CS. But those babies requiring surgery, such as those with abdominal wall defects, do not benefit from Caesarean birth per se but from prompt access to medical and surgical treatment) (*Quirk et al., 1996*).
- Vertical transmission of HIV (*Brocklehurst, 2002*) and Hep B are reduced by CS (*Lee et al., 1988*).
- When the mother has a primary herpes infection at the time of birth, CS lowers the risk of infection in the baby (www.rcog.org.uk/guidelines).
- CS avoids the increased risk of injury associated with instrumental delivery. Occasionally, forceps may cause trauma to the face or head. Vacuum extraction is associated with an increased risk of cephalhaematoma (a collection of blood under the skin), subgaleal haematoma (a collection of blood in deeper tissue which can have serious consequences), retinal haemorrhages, bruising and jaundice (*Rennie, 1999*).

Risks

- CS is associated with respiratory distress syndrome and transient tachypnoea (rapid, shallow breathing due to retained lung fluid) of the newborn. These conditions mean babies will need special care and will be separated from their mother. The risk at 38-39 weeks is double the risk at 39-40 weeks. The increased risk of breathing difficulties and admission to special care at 39 weeks is also significantly greater than at 40 weeks (*Rennie, 1999; Hook et al., 1997; Levine E et al. 2001*).
- Surgical lacerations of the baby can occur during cutting the uterus.
- The baby's mother may be in pain, have difficulty in establishing breastfeeding and there may also be an adverse impact on bonding (*Rennie, 1999*).

BENEFITS & RISKS ASSOCIATED WITH CS FOR THE MOTHER

Many of the same factors apply when considering the balance of benefits and risks of CS from the woman's point of view, including the difficulties inherent in applying the available evidence to the particular circumstances and concerns of the individual. However, in general terms, CS seems to present more risks for the mother than for the baby, as she is the one undergoing major surgery. For some groups of women, however, the benefits undoubtedly outweigh the risks. One important consideration to bear in mind is the long-term effects, including the risk/benefit balance for future pregnancies, as well as the short-term considerations.

Benefits

- Elective CS can be protective against anal sphincter damage and pudendal nerve damage (*O'Herlihy, 2000*). However, it is not easy to predict which first-time mothers are more at risk and subsequent urinary and fecal incontinence is also known to occur after elective CS (*Clarkson et al., 1999*). Urinary incontinence also occurs in childless women (*Buchsbaum et al., 2002*).
- In the short term, women may experience fewer sexual problems after Caesarean than vaginal birth. By six months post-delivery there is very little difference (*Barrett and McCandlish, 2002*).
- An elective CS can protect women who have had a previous traumatic birth experience. There are other alternatives, and counselling can reduce the numbers who request a CS (*Ryding, 1993*)

Risks

- An increased risk of maternal mortality is associated with CS (*Lilford et al., 1990; Scuitemaker et al., 1996; Hall et al., 1994*). However, it is not possible to determine the proportion of increased risk of maternal death that is attributable to already existing conditions and what, if any, to the Caesarean section itself. The absolute combined risk of Direct and Indirect Maternal Death is very small (being 11.4 per 100 000 births in 1997-1999) Both emergency and (to a lesser extent) planned CS is associated with an increased risk of severe maternal morbidity, including infections, haemorrhage (*Waterstone et al., 2001*) and blood clotting disorders (*CEMD, 2001*). Risks have been reduced with the use of prophylactic treatments. Increased exposure to general or regional anaesthesia can result in complications.
- There is a greater risk of thromboembolism (blood clotting disorders) with CS, but all women undergoing surgery should receive prophylaxis to prevent these problems (*CEMD, 2001*).
- Other effects of CS for the mother include increased risk of postpartum haemorrhage (*Waterstone et al., 2001*), hysterectomy (*Gould et al., 1999*), damage to bladder and urethers (*Rajaseker and Hall, 1997*), urinary infections (*Enkin et al., 2000*), post-operative wound infections (Enkin et al., 2000) and endometritis (inflammation of the lining of the womb) (*Enkin et al., 2000*).
- Infections have been reduced by the use of prophylactic antibiotics with both elective and emergency Caesareans but not eradicated (*Smaill and Hofmeyr, 2002*).
- There is some evidence of poorer psychological outcomes after CS, though the circumstances in which the surgery is carried out and the women's involvement and feelings about the decision are influential (*Enkin et al., 2000; Clement, 2000*).
- Short-term morbidity associated with CS includes backache, constipation and depression (*Hillan, 1992*).
- In the longer term, women may experience subsequent subfertility and infertility (*Hemminki, 1996; Enkin et al., 2000; Jolly et al., 1999; Murphy et al., 2002*), increased risk of miscarriages (*Hemminki, 1996; Hall, 1989*) and a higher risk of placenta praevia (*Hemminki, 1996; McMahon 1997*), placenta praevia accreta (Khouri and Sultan, 1994) or placental abruptions in subsequent pregnancies (*Hemminki, 1996*).

KEY POINTS

In some circumstances there is an absolute indication for CS over vaginal birth for the well being of the baby, the mother or for both. In many situations there is debate about the extent to which CS is performed. It is important for health professionals and parents to weigh up the available evidence of benefits and risks for the mother and baby of alternative modes of birth, and how these relate to their individual circumstances and what the woman wants.

This weighing in the balance is not an exact science as there are so many unknowns. Comparing a planned vaginal birth with a planned CS before the onset of labour, Rennie (1999) concluded that from the baby's point of view, CS offers some protection against musculo-skeletal and some neurological problems (trauma), "but most of these are minor and do not carry mortality, although some carry morbidity". However, "the balance of risk is actually in favour of vaginal delivery - unless you are a large, or a breech baby, or if the mother is infected with a viral problem", because of the risk of "significant respiratory morbidity" with a planned CS before term. Others weighing up the evidence have not included "large" babies as an exception (*CESDI, 1999*) perhaps because of the difficulties of reliable assessment of the baby's size during pregnancy.

For women wanting to minimise the chance of having a CS for failure to progress or fetal distress, early decisions about place of birth, support during labour, methods of monitoring and coping with pain, and keeping upright and mobile may be important. Once difficulties have been identified and the mother has lost confidence and become tired, a CS is more likely to seem like the appropriate solution.

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