

NCT EVIDENCE BASED BRIEFING

Vaginal Birth After Caesarean (VBAC) - part 1

By Cynthia Clarkson, Co-chair NCT Research Networkers' Panel,
with Mary Newburn, NCT's Head of Policy Research

Introduction

The benefits and risks of caesarean birth for both mothers and babies have already been discussed in this journal¹. This briefing will therefore concentrate on the specific evidence relating to the options for pregnant women who have already had one or more caesarean births. Following a previous caesarean birth, a pregnant woman can plan for a repeat caesarean or for a vaginal birth (VBAC). A planned VBAC may result in a vaginal birth or an emergency caesarean birth.

This briefing is in three parts. Part 1 includes:

- the history of caesarean section and subsequent modes of birth;
- incidence of VBAC; and
- the conditions which influence VBAC in women planning a vaginal birth after a caesarean one.

Parts 2 and 3 will include the short and long-term risks of planned repeat caesarean and planned VBAC to mother and baby, including the risk of uterine rupture. The recommendations of the National Institute for Clinical Excellence (NICE) Caesarean section guideline and those of the Expert Advisory Group on Caesarean Section in Scotland will be discussed alongside women's views and factors which may influence their preferences and choices.

History

Since the beginning of the 20th century, there has been an intense debate as to whether women who have had one or more previous caesarean births should plan to birth their subsequent babies vaginally or by repeat caesarean. The term VBAC originated in North America. Other terminology includes 'trial of vaginal birth', 'trial of labour' and 'trial of scar'². Up until the early 1980s, obstetricians in North America steadfastly followed Craigin's 1916 statement 'once a caesarean always a caesarean'. However, Craigin believed it was absolutely essential to avoid the first caesarean if possible, thereby reducing the need of future surgical births. Unfortunately, this teaching has largely been forgotten³. In contrast to the American view, obstetricians in Europe, Asia and Africa have tended to favour planned vaginal birth after caesarean (VBAC), in selected cases.

At the beginning of the 20th century, when neither antibiotics nor blood transfusions existed, surgery was a much more risky procedure. Caesarean section was traditionally performed using a classical or vertical incision on the body of the uterus, reaching from the lower segment far up into the body of the uterus. No matter how carefully this classical incision was sutured, often, the uterus would rupture towards the end of a subsequent pregnancy or in a subsequent labour. That is a symptomatic defect involving the entire thickness of the

uterine wall, requiring immediate surgery. The caesarean rate, at this time, was about 1% and surgery was only resorted to when the vaginal birth of a living baby was impossible.

In the UK during the 1920s and 1930s, Holland and Munro Kerr⁴ drew attention to the hazards of the classical operation and introduced the lower segment transverse uterine incision. As a result, use of the classical caesarean began to decline. The lower segment scar ruptured about ten times less frequently than the classical scar. In subsequent years, British and European women often had a choice of a planned VBAC. In the US, however, where uterine rupture received far greater attention than the risks of repeat caesarean surgery, obstetricians were far more likely to carry out repeat caesareans.

By the 1970s and early 1980s, it was concluded in North America that planned VBAC was relatively safe⁵. This conclusion was confirmed by larger studies in the 1980s. As a result, North American obstetricians abandoned '*once a caesar always a caesar*' and offered planned VBAC to appropriate women. The VBAC rate in the US increased from 3.5% in 1980, to 25% in 1993 and peaked at 28.3% in 1996. In the US, obstetricians, women desiring an alternative to caesarean birth, government and private insurance companies enthusiastically embraced planned VBAC, which was strongly advocated and often mandated as a means of lowering caesarean rates and the associated costs. More recently renewed controversy² about the relative safety of planned VBAC compared with planned repeat caesarean has led, particularly in North America, to an ebbing of enthusiasm for VBAC once again. In the US, the VBAC rate was 12.7% in 2002⁶ and VBAC also appears to be in decline in Europe. In Scotland in 1990, the VBAC rate was 50%⁷, whilst in 1997-9 it was 36%⁸.

The relative novelty of VBAC in North America has meant that it has attracted much more attention on that side of the Atlantic than in Europe. It is necessary therefore, when looking at the evidence and literature on this subject to keep in mind the different cultures and healthcare systems from which it comes⁹. Some of the available evidence on VBAC may not be directly relevant to women in the UK.

The evidence

There have been no randomised controlled trials (RCTs) regarding VBAC, so most of the evidence is based on observational data or cohort studies that have a recognised higher potential for bias than RCTs. A preference trial, the ACTOBAC trial (where women have the choice of a planned VBAC, or a planned repeat caesarean, or being randomised to one or the other) has been proposed, but its protocol has been criticised for

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trivialising caesarean surgery¹⁰. The possibility remains in non-randomised studies that the two groups of women, those who planned VBAC and those who planned a repeat planned caesarean, may have differed from each other in ways which may have accounted for the differences observed.

VBAC rates

In England and Wales, there was an almost complete audit of all births occurring in hospital for a specified three month period¹¹. This gave an overall VBAC rate of 33%, with a wide range for individual hospitals of 6%- 64%¹¹. Of the women who had a repeat caesarean in the index pregnancy, 44% were reported to have been offered a planned VBAC, but the range between units was wide: from 8% to 90%. An audit of births in Scotland over the period 1992-7 also found wide variation between units in women planning a VBAC after one caesarean with a single, head-down baby at term (44.2%-89.4%), averaging 68.6%. In this group, those having a vaginal birth also varied widely (30.4%-64.4%), averaging 50.6%¹².

In the US, VBAC rates are much lower than in the UK. In 2002, the national rate was just 12.7%. In part this is associated with fewer women planning to have a VBAC; in addition, of those who plan a VBAC, fewer women actually have a vaginal birth¹³. However, Brazil is a more extreme example of highly medicalised childbirth, as the overall caesarean birth rate is 50% - 60% and VBAC is almost non-existent². In contrast, in Holland the caesarean rate is lower and the VBAC rate is higher than those in the UK. One study reported the overall caesarean rate was 6.5%, the planned VBAC rate was 73% and the VBAC rate 56%¹⁴.

Contraindications to planning VBAC

The absolute contraindications to planning VBAC include a previous classical caesarean uterine scar, an inverted T-shaped uterine incision extending into the body of the uterus and previous uterine rupture⁷. The risk of repeat rupture is 6% if the scar rupture is confined to the lower segment, but rises to 32% when the ruptured scar includes the body of the uterus^{15,16}. Additional contraindications include surgery through the fundus of the uterus, a truly contracted pelvis and any medical or obstetric complication which precludes vaginal birth⁷.

In the last 15 years, improved neonatal care has increased the survival rate of very pre-term babies. This has led to a reduction in the stage of gestation at which obstetricians are prepared to perform a caesarean for fetal indications. Babies are being delivered by caesarean at, or even before, 26 weeks. At these early gestations, the lower segment of the uterus is poorly formed. As a result, in effect these caesareans are transverse incisions in the body of the uterus. The extent of the increased risk in subsequent pregnancy and labour is currently unknown, but in theory at least, they will result in greater risks in future pregnancies than the risks associated with the lower segment operation carried out at term¹⁷. Planning a VBAC in this situation is, to say the least, controversial¹⁵.

Clinical factors which influence the vaginal birth rate

As discussed above in the section on VBAC rates, there are cultural factors that influence the proportion of planned VBACs that result in a vaginal birth. There are also a number of clinical factors which are known to affect - or in some cases are believed to affect - the VBAC rate, including the indication for the previous caesarean; maternal factors; the size of the baby and the way the labour is managed.

Indication for previous caesarean

The likelihood of a planned VBAC resulting in a vaginal birth rather than an emergency repeat caesarean is strongly related to the indication for the previous caesarean. For example, a previous caesarean for breech gives a higher VBAC rate than a previous caesarean for 'failure to progress'. Coughlan et al. found that women who had a planned VBAC after a previous caesarean for breech had a vaginal birth rate of 84%, about the same rate as that for primiparous women planning a vaginal birth¹⁸. Women who planned a VBAC after a previous caesarean for 'fetal distress' had twice the likelihood of a caesarean birth compared with first time mothers. Women who had a previous caesarean for apparent disproportion or 'failure to progress' had the lowest rates of vaginal birth, but still had rates over 50%⁷.

A primary caesarean carried out at full dilatation, or secondary arrest in late labour, has often been considered indicative of disproportion and an indication for planned repeat caesarean birth in subsequent pregnancies. From the five series examining vaginal birth rates in these situations, 415 women planned a VBAC and 160 (39%) had a vaginal birth. In one report of 245 women, only 13% had a vaginal birth, but in all the others the VBAC rate was in the range 65%-80%¹⁹. In one series of data, from a Dutch region where the overall caesarean rate was 8%-9%, 78% of women whose first caesarean had been performed for delay in descent during the second stage of labour, planned a VBAC and 80% achieved a vaginal birth²⁰. This tends to emphasise the importance of cultural factors and how they influence attitudes towards clinical factors. The evidence suggests that expectations and beliefs about dystocia and physiological birth have a strong influence on VBAC rates.

Maternal factors - history of vaginal birth, weight and age

The chance of having a VBAC are greater for women who, as well as having previously had a caesarean, have given birth vaginally at some stage^{21,22}. If the vaginal birth was subsequent to the caesarean, the rate of VBAC is very high, with one study reporting a rate of 94.6%²³.

The woman's weight and age are the other main factors associated with varying rates of VBAC, with slimmer and younger women being more likely to have a vaginal birth. Shannon Carroll et al. stratified 209 women planning VBAC into three groups based on maternal weight: lower than 200, 200-300 and more than 300 pounds. The vaginal birth rates were 81.8%, 57.1% and 13.3% respectively²⁴. In another study, 510 women planning a VBAC were divided into four groups based on body mass index: underweight, normal, overweight and obese. The

vaginal birth rates respectively were 84.7%, 70.5%, 65.5% and 54.6%²⁵. In a cohort study of 1,750 women planning a VBAC without a prior vaginal birth, maternal age of 35 years or more was associated with a significantly lower rate of VBAC²⁶.

Few other aspects of women's health seem to make a significant difference. For example, development of gestational diabetes (GDM) managed by a controlled diet did not influence the vaginal birth rate in women planning VBAC, although fewer women with diet-controlled GDM had planned a VBAC²⁷.

Size of the baby

It has been suggested that the size of the baby affects the likelihood of VBAC, though how much this is to do with good clinical practice and how much cultural expectation is unclear. In a retrospective cohort of 9,960 women with a singleton baby and a history of one caesarean, Elkousy et al. found that there was a successive reduction in the vaginal birth rate for babies weighing more than 4kgs. The VBAC rates for babies of different weights were: <4000g 68%, 4000- 4249g 52%, 4250-4500g 45%, and >4500g 38%²⁸. If it were possible to estimate with accuracy which babies would be born weighing over 4kgs, this might be useful information to inform decision making. However, it is important to note that methods for assessing the weight of babies during pregnancy, including ultrasound and palpation, do not give very reliable results²⁸. A study of women planning VBAC with a history of a single caesarean and no other births found that six out of ten women who gave birth to a baby over 4kgs had a VBAC (60%), compared with seven out of ten who had a smaller baby²⁹. A retrospective study of 12,463 women planning VBAC found that the vaginal birth rates for term and preterm groups were 74% and 82% respectively (Quinones et al. 2005)³⁰.

Management of labour

Most of the research specifically addressing the optimal management of labour to facilitate a VBAC has addressed questions concerning which, if any, medical interventions might be effective. There has been little systematic evaluation work on supporting the physiology of labour, though some descriptive studies draw important transferable conclusions. It is known that one-to-one support throughout labour makes a difference to labour outcome³¹, and there is growing evidence that a peaceful, comfortable environment³² with space to move around and adopt a variety of forward-leaning positions³³ makes a difference. Restrictive time limits for labour and continuous electronic fetal monitoring are factors known to increase rates of emergency caesarean sections³⁴ though continuous monitoring is recommended by NICE for women having a VBAC³⁵.

It has been suggested that rates of VBAC may be increased if women are offered an induction of labour at or just before term to prevent additional growth of the baby. However, there is little evidence to support this practice² and evidence that it may have a contrary effect. In a retrospective evaluation of Swiss women planning a VBAC, women who were induced were almost one and a half times as likely to have a caesarean compared with those who went into spontaneous labour³⁶. It is known however, that among women planning a VBAC, induction of labour is more likely to lead to a vaginal birth if the

woman's cervix is already 'ripe'. In one study, the VBAC rates for women were positively correlated with their modified Bishop's scores (0-2 = 57.5%, 3-5 = 64.5%, 6-8 = 82.5% and 9-12 = 97.0%)³⁷.

Summary and discussion

To summarise, VBAC has been practised more in the UK and other parts of Europe than in North or South America, though much of the evidence on caesarean birth and VBAC comes from the US and it may not be directly relevant to other cultures. There are widely varying VBAC rates between maternity units in the UK. This may be in part because the evidence needs careful interpretation and there are few comprehensive summaries available³⁸. In some cases, such as a predicted high birth weight baby, it is difficult to differentiate between clinical indications for repeat caesarean section and cultural beliefs about what is necessary or appropriate.

It is known that younger, slimmer women, particularly those who have had a vaginal birth in the past and whose previous caesarean was for a persistent breech-presenting baby, are on the whole more likely to have a VBAC than other women. Many women considering a VBAC do not fit this profile and a number of scoring systems have been used to predict who might be more likely to have a vaginal birth. However, there is no very reliable method⁷. It has been noted that it does not take an elaborate scoring system, however, to predict that a woman being induced with a large baby at 42 weeks gestation and an unfavourable cervix has a lower chance of a vaginal birth than a woman who presents at 37 weeks at 5cm dilatation with a small baby³⁹.

Key points

- In England and Wales the most recent data in 2000 shows a VBAC rate of 33%.
- In Scotland the planned VBAC rate in women with one previous caesarean and a single, head down baby at term was 68.6% and the national VBAC rate was 46% over the period 1992-7.
- Available data show a wide variation in VBAC rates between hospitals in England and Wales 6%-64% and in Scotland 26%-63%.
- Cultural and clinical factors influence the likelihood that a woman will be encouraged to consider planning a VBAC and the likelihood of VBAC occurring.
- Further research is needed on the most effective ways of supporting VBAC women during labour to maximise their chance of having a safe and straightforward birth.

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