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Maternal height and prior vaginal delivery as predictive factors in trial of labour after one caesarean section

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Summary

A retrospective study of 304 booked parturients with one previous lower segment caesarean section for non-recurrent indications was carried out with regards to factors predicting successful trial of vaginal delivery. The height of the parturients, as well as a history of a previous vaginal delivery appeared to be predictive factors of success. Seventy per cent of the parturients succeeded in delivering vaginally. The mean fetal birthweight was 3362 g for women with vaginal delivery, while the mean maternal height was 1.58 m. Of those who needed a repeat caesarean section, surgical intervention in 46.15% of the patients was indicated by poor cervicometric progress, which might have been appropriately addressed by oxytocin augmentation and careful monitoring in labour. Regarding prior vaginal delivery, only 31.1% of parturients with a negative history, but 63.15% with a positive history, had a successful trial. Three cases of ruptured uterus were all the result of unacceptable delay in carrying out an abdominal delivery when it was clearly indicated. A large prospective study into this aspect of obstetric care will probably define additive effects of these two definite factors.

Introduction

The management of patients with primary caesarean section in subsequent deliveries has always generated differing opinions in the obstetric literature (Lawson and Ajobor, 1968; Gibbs, 1980). The main concern in this group of patients is the fear of scar rupture (Okpere *et al.*, 1982) and the feasibility of vaginal delivery. Contemporary obstetric literature is replete with reported success rates of vaginal delivery after primary caesarean section. This has ranged from 60% to 90% (Nielsen *et al.*, 1989; Yetman and Nolan, 1989). Attempts have been made to predict and improve the chances of success of vaginal delivery following a caesarean section. These attempts include antenatal screening of patients, to identify contradiction to trials of vaginal delivery (Martin *et al.*, 1988).

It is not clear what effects certain material characteristics have on the probability of vaginal delivery after previous caesarean section. At least one study from West Africa (Kwawukume *et al.*, 1993) considered maternal height. Yet another (Bedoya *et al.*, 1992) reviewed the role of a previous vaginal delivery in the same context. We sought in this study, to evaluate the effect of maternal height and a history of previous vaginal delivery on the outcome of trial of

vaginal delivery following a caesarean section. This, we believe would initiate a reproducible definition of the place of the two as predictive indices.

Patients and methods

Records of deliveries at the labour ward of our hospital, University College Hospital, Ibadan, Nigeria (UCH) were reviewed over a 5-year period. Names of consecutive patients who had been allowed a trial of vaginal delivery following one lower segment caesarean section were extracted, and their individual case notes, retrieved.

We excluded from the study unbooked patients, patients with a multiple pregnancy, fetal malpresentations, and patients with other contraindications to vaginal delivery. In addition, it was hospital policy not to augment labour with oxytocin in women with a previous caesarean scar. A small number of cases violated this protocol, and were also excluded.

As a rule, patients with uterine scars are not subjected to induction of labour in our hospital. All patients have their height measured at the time of booking. A clinical pelvimetry is performed on all patients with one previous caesarean section at gestational ages of between 36 and 38 weeks. In very occasional instances, a single shot radiographic or computerised tomographic pelvimetry is done, to confirm adequacy of the antero-posterior diameter of the pelvis.

Intramuscular analgesic drugs in labour are administered routinely to all women whose cervical dilatation is 6 cm or less. We do not practice routine fetal blood sampling or cardiotocography.

A repeat caesarean section is resorted to for standard obstetric reasons. Failure of progress in labour is accepted in our centre to mean a lack of progressive dilatation of the uterine cervical os of at least 1 cm/hour with or without an associated fetal head descent, despite adequate uterine contractions.

Documented features of uterine scar dehiscence or rupture were checked from operation notes if surgical intervention was resorted to.

For all patients recruited into the study, the following data were recorded: indication for previous caesarean section, height, fetal birthweight and indications for caesarean section. The data was coded,

Table I. Maternal height and outcome of trial of labour after one caesarean section

Height cm (inches)	Outcome		Total per height category
	Vaginal delivery	Failed trial	
≤ 150 (60)	5 (38.46%)*	8	13
151-160 (60.4-64.0)	7 (14.17%)	10	17
161-170 (64.4-68.0)	121 (78.57%)	33	86
171-180 (68.4-72.0)	54 (62.79%)	32	154
≥ 181 (72.4)	36 (81.81%)	8	44

($\chi^2 = 14.44$, $P = 0.002$, $df = 3$).

*The percentage in parenthesis are of the total number per height category who succeeded in delivery vaginally.

Table II. Previous vaginal delivery and outcome of trial of vaginal delivery after caesarean section

Previous vaginal delivery	Outcome	
	Vaginal delivery	Failed trial
Yes	137 (64.32%)	43 (47.25%)
No	76 (35.68%)	48 (52.75%)
Total	213	91

($\chi^2 = 10.94$, $df = 1$, $P = 0.0009$).

analysed and subjected to chi-squared test, with statistical significance at $P < 0.01$.

Results

Three hundred and four patients with complete documentation were eligible for inclusion into the study. Of these, 213 (70.1%) achieved vaginal delivery while 91 (29.9%) needed a repeat caesarean section. One hundred and thirty-seven (45.1%) of the women had a history of vaginal delivery antedating caesarean section.

The mean maternal height was 1.58 m (SD 0.05) for women with a successful trial, while it was 1.57 m (SD 0.5) for those who needed a repeat caesarean section. The mean fetal birthweight was 3.362 g (SD 0.571) in women with a successful trial, and 3.115 g (SD 0.0575) those who needed a repeat caesarean section. The main indications for repeat caesarean section were poor cervicometric progress (46.2%), fetal heart rate abnormalities (16.5%), persistent occipito-posterior position of the fetus (7.7%), inefficient uterine action (25.3%) and severe pre-eclampsia in the first stage of labour (4.4%).

Of the studied babies so delivered per abdomen, there were five instances of possible long term neurological deficit. In two cases this was presumed to be due to difficult abdominal delivery because of a fetal head deeply impacted in the maternal pelvis, and in a further three meconium aspiration was the probable cause. All presented acutely with low apgar scores.

In Table I, the relationship between the maternal height and outcome of the trial is summarised.

The relationship between a history of previous vaginal delivery in the patient and outcome in index pregnancy is shown in Table II.

Three women were entered into the study but could not be managed by prompt caesarean section when indicated. There was in each of these cases considerable administrative delay and this resulted in scar dehiscence in one case and uterine rupture in two.

Discussion

Caesarean section is not an alternative to vaginal delivery, as it is not entirely safe (Derom *et al.*, 1987). However, it has been pointed out that repeat caesarean section accounts for approximately half the increase in rate (Weinstein *et al.*, 1996). Emerging data also suggests that vaginal delivery, as compared with caesarean section, amongst other benefits avoids the psychological impact of caesarean delivery (Norman, 1995).

In obstetric practices in developing countries, it would appear that there is almost a cultural compulsion to delivery vaginally (Adeleye and Obisesan, 1990). It is thus important for the obstetric care provider to identify acceptable predictive indices for a vaginal birth after caesarean section.

The percentage of patients in each height range, who achieved a successful vaginal delivery suggests that increasing height is associated with greater success. This is despite the fact that fetal weight may increase with increasing parity. It would appear that, to some extent the finding in Ghanaian women (Kwawukume *et al.*, 1993) may also apply in other patients with the previous lower caesarean section. It is probable that a greater proportion of women who had repeat caesarean sections might have delivered vaginally if we had used intrauterine pressure monitoring and oxytocin stimulation (Flamm *et al.*, 1984) together with fetal scalp blood analysis (Ayromlooi and Garfinkel, 1980).

From this study we believe that increasing maternal height contributes to the likelihood of vaginal delivery after one previous caesarean section. In addition, the obstetric history of having had one previous vaginal delivery further increases the chances of success. Presumably, a previously responsive cervix is least likely to cause dystocia in a subsequent labour.

Again, efficacious cervical ripening (Stone *et al.*, 1994) with or without subsequent oxytocin stimulation, would be necessary to disprove this contention.

Clearly, a larger prospective study would be necessary to score the strength of variables that are clearly related to vaginal delivery after a previous caesarean section. A multivariate analysis of maternal height, previous vaginal delivery and fetal weight may help in developing a feasibility scoring for trial of labour after one caesarean section. It would hopefully not aim at suggesting that in some women the whole exercise be classified as 'low risk' but, rather, allow obstetric care providers to assess (Troyer and Parisi, 1992) a dynamic process that has social, economic, psychological and medico-legal undertones (Stafford, 1991).

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References

- Adeleye J. A. and Obisesan K. A. (1990) Delivery after primary caesarean section. *Tropical Journal of Obstetrics and Gynaecology*, **8**, 1-4.
- Ayromlooi J. and Garfinkel R. (1980) Impact of fetal scalp blood pH on incidence of caesarean section performed for fetal distress. *International Journal of Gynaecology and Obstetrics*, **17**, 391-392.
- Bedoya C., Bartha J. I., Rodriguez I., Fantan I., Bedoya J. M. and Sanchez-Ramos J. (1992) A trial of labour after caesarean section in patients with or without a prior vaginal delivery. *International Journal of Gynaecology and Obstetrics*, **39**, 285-289.
- Derom R., Patel N. B. and Thiery M. (1978) Implications of increasing rates of caesarean section. In: *Progress in Obstetrics and Gynaecology*, edited by J. Studd, volume 6, chapter 9, pp. 175-194. Edinburgh, Churchill Livingstone.
- Flamm B. L., Dunnett C., Fischermann E. and Quilligan E. J. (1984) Vaginal delivery following caesarean section: use of oxytocin augmentation and epidural anaesthesia with internal tocodynamic and internal fetal monitoring. *American Journal of Obstetrics and Gynecology*, **148**, 759-763.
- Gibbs C. E. (1980) Planned vaginal delivery following caesarean section. *Clinical Obstetrics and Gynecology*, **23**, 507-515.
- Kwawukume E. Y., Ghosh T. S., Wilson J. E. *et al.* (1993) Maternal height as a predictor of vaginal delivery. *International Journal of Gynaecology and Obstetrics*, **41**, 27-30.
- Lawson J. B. and Ajobor L. N. (1968) Ruptured caesarean section scar. *Journal of Obstetrics and Gynaecology of the British Commonwealth*, **75**, 1296-1300.
- Martin J. N., Morison J. C. and Wisner W. L. (1988) Vaginal birth after cesarean section: the demise of routine repeat of abdominal delivery. *Obstetrics and Gynecology Clinics of North America*, **15**, 719-736.
- Nielsen T. F., Liungblad U. and Hagberg H. (1989) Rupture and dehiscence of caesarean section scar during pregnancy and delivery. *American Journal of Obstetrics and Gynecology*, **160**, 569-573.
- Norman P. (1995) Vaginal birth after caesarean section (Commentary). *The Lancet*, **345**, 142.
- Okpere E. E., Oronsaye A. U. and Imoedembe D. A. (1982) Pregnancy and delivery after caesarean section. *Tropical Journal of Obstetrics and Gynaecology*, **3**, 45-48.
- Stafford R. S. (1991) The impact of non-clinical factors on repeat caesarean section. *Journal of the American Medical Association*, **265**, 59-63.
- Stone J. L., Lockwood C. J., Berkowitz G., Alvarez M., Lapinski R., Valcamonica A. and Berkowitz R. L. (1994) Use of cervical prostaglandin E₂ gel in patients with previous caesarean section. *American Journal of Perinatology*, **11**, 309-312.
- Troyer I. R. and Parisi V. M. (1992) Obstetric parameters affecting success in a trial of labour: designation of a scoring system. *American Journal of Obstetrics and Gynecology*, **167**, 1099-1104.
- Weinstein D., Benshushan A., Ezra Y. and Rajansky N. (1996) Vaginal birth after caesarean section: current opinion. *International Journal of Gynecology and Obstetrics*, **53**, 1-10.
- Yetman T. J. and Nolan T. E. (1989) Vaginal birth after caesarean section: a reappraisal of risk. *American Journal of Obstetrics and Gynecology*, **161**, 1119-1123.