

Early or late bath during the first stage of labour: a randomised study of 200 women

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Objective: to compare obstetric outcome after a bath offered to women on two different occasions during the first stage of labour. The aim of the study was to determine whether an early bath affected the progress of labour and the use of analgesia when compared with a late bath during the first stage of labour.

Design: a randomised prospective pilot-study.

Setting: the delivery ward at Östra Hospital in Göteborg.

Participants: two hundred women, at low obstetric risk.

Interventions: the women were randomised to either the 'early bath group' or the 'late bath group'. The women in the 'early bath group' had a bath before a cervical dilatation of 5 cm, while the women in the 'late bath group' had a bath after the cervix was 5 cm dilated.

Measurements and findings: the women in the 'early bath group' had a longer time period from established labour to delivery (9.8 hours) compared to the 'late bath group' (8.5 hours) ($p < 0.004$). A higher proportion of women in the 'early bath group' needed oxytocin administration (57%) compared to the 'late bath group' (30%) ($p < 0.01$). Epidural analgesia was used by 27% of the women in the 'early bath group' and by 9% in the 'late bath group' ($p < 0.001$). One baby in the 'early bath group' had clinical signs of infection and required antibiotic treatment. No cases of amnionitis or endometritis were present in the women.

Key conclusions and implications for practice: the findings suggest that a bath during the first stage of labour should preferably be used after a cervical dilatation of 5 cm to avoid prolonged labour, and an increased use of oxytocin and epidural analgesia.

INTRODUCTION

The use of alternative methods of pain relief, such as a bath during labour, has increased in the past decade (Simkin 1989). A warm bath may provide relaxation and it gives great satisfaction to users (Odent 1983, Waldenström & Nilsson 1992, Cammu et al 1994). No studies have demonstrated that a bath is more beneficial for pain relief during labour compared with other methods (Gradert et al 1987, Lenstrup et al 1987, Cammu et al 1994). Today, many labouring women are aware of the possibility of bathing during labour. Clinical observations suggest that some women who have an early bath stay in the tub for a short period

because their contractions space out, particularly if labour is not well established (Jackson et al 1989, Jepson 1989).

The aim of this pilot study was to determine whether an early bath in the first stage of labour affected the progress of labour and the use of analgesia when compared with a late bath.

METHODS

The department in which this study was undertaken is in the west of Sweden and has about 4000 deliveries per year. It is a regional referral centre and has both

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obstetric and neonatal intensive care units. A midwife is always on duty to observe the women carefully and care for those having a normal delivery. Where labour or delivery is abnormal an obstetrician from the hospital staff is involved. The progress of labour is assessed by a midwife by vaginal examination about every third hour. If no, or slow, progress of labour is noted amniotomy is performed and, if necessary, oxytocin is administered. Five units of oxytocin is administered in 500 ml sodium chloride. The initial dose of oxytocin is 2.5 IU/minute and the infusion rate is increased with 2.5 IU/minute every 30 minutes until satisfactory progress is achieved. Pain relief with epidural analgesia is chosen by about 15% of the women.

The study population consisted of 200 healthy pregnant women at low obstetric risk after 34 complete weeks of gestation. The criteria for enrolment in the study were:

- women with a singleton fetus in cephalic presentation;
- spontaneous onset of labour and/or ruptured membranes with a cervical dilatation of less than 3 cm;
- established labour defined to be present when the contraction frequency was \geq three/10 minutes;
- a normal fetal heart rate (FHR) trace on arrival at the hospital.

The following calculations were used to support the sample size: with a probability of 50%, 30% or 15% for the need for a specific method of pain relief in one of the groups, and 30%, 14% and 4% respectively, or lower in the other, the power 80% was achieved at the significance level of 0.05, two-tailed Fisher's exact test.

All the women gave their informed consent and the study protocol was approved by the Medical Ethics Committee, University of Göteborg. A list of random numbers was generated by a computer. A sealed, opaque and sequentially numbered envelope containing the randomisation code was used for each woman. The women were allocated to two different regimens with regard to bath. The women in the 'early bath group' ($n = 100$) were allowed to begin to bath before a cervical dilatation of 5 cm, while the women in the 'late bath group' ($n = 100$) began to bathe after a cervical dilatation of 5 cm. When undertaking an evaluation of a treatment it is usual to have a control group where no treatment is given in order to assess the Hawthorne effect (Roethlisberger & Dickson 1939). However, women are already aware that they may bathe in labour and it was decided that it was unacceptable to withdraw this facility from a group of labouring women.

A bath (a bath tub), oval in shape, each side 1.5 m long and 40 cm deep, filled with 300 litres of water at a temperature not exceeding 38°C, without chemicals added, was used. During the bath, the FHR was monitored with a scalp electrode by telemetry, or by auscultation. Conventional methods of pain relief were used according to the woman's own wishes and needs, unless there were medical contraindications.

The maximum stay in the bath was until the second stage of labour.

Chorioamnionitis in labour was considered to be present if rectal temperatures exceeded 38°C on two occasions, one hour apart, without evidence of any other source of fever. Postpartum endometritis was judged to be present if there was fever \geq 38°C without any other apparent cause.

Apgar scores were recorded for the babies after birth. The babies were examined on two occasions by a paediatrician within the first week after birth. Infections diagnosed on clinical grounds within the first week after birth were recorded and treated with antibiotics.

Data analysis

Wilcoxon's rank-sum test was used to compare differences between the groups for continuous data. Proportions were compared by using Fisher's exact test. A p -value of less than 0.05 was considered statistically significant. SAS statistical software was used for analysis.

FINDINGS

Obstetric outcome

Eight of the 200 women included did not enter the bath. The reasons for this were: lack of time before delivery for one woman in the 'early bath group'; and in the 'late bath group' four women needed pharmacological pain relief, one woman had an abnormal FHR pattern, and two women delivered before reaching the bath. The characteristics of the women in the two groups are shown in Table 1.

Epidural analgesia was used more often in the 'early bath group' and there was a higher use of oxytocin (Table 2). The length of time from established labour to delivery differed between the 'early bath group' and the 'late bath group', and were 9.80 and 8.48 hours respectively ($p < 0.004$). Among the women in the 'early bath group', the frequency of normal delivery was 91% compared with 92% for the women in the 'late bath group'. No cases of amnionitis or endometritis were recorded.

Neonatal outcome

No women who took a bath had to leave the tub because of an abnormal FHR trace during the first stage of labour. The analysis of the FHR trace immediately after the bath showed normal patterns in all women. All the babies had an Apgar score \geq 7 one minute after birth. One baby in the 'early bath group' had signs of infection. This baby was treated with antibiotics and was kept in the neonatal care unit for three days. The eight babies delivered by the women who did not bath during labour did not differ from the babies delivered by the bathing women with regard to Apgar score and infectious morbidity.

	Group 1 (n = 100)	Group 2 (n = 100)	p*
Primipara (%)	72	60	0.1
Multipara (%)	28	40	0.1
Maternal age (y)	26.3 (4.6)	27.2 (5.28)	0.22
Birth weight (g)	3550 (424)	3616 (465)	0.26
Bishop score just before randomisation	6.38 (1.55)	6.73 (1.53)	0.07

Findings are mean (SD) or n (%) where appropriate; * Fisher's exact test.

DISCUSSION

This is a small study conducted in one hospital in Sweden. However, the findings from this pilot study can be used in planning larger studies. In the present study, an association was found between an early bath and a longer time interval from established labour to delivery. In addition, a higher frequency of oxytocin use and the need for epidural analgesia were recorded in women bathing before a cervical dilatation of 5 cm.

In the study we compared two groups of women who, after a normal pregnancy, agreed to bath during the first stage of labour. No other study of early versus late bath during labour has been reported. Several authors (Odent 1983, Lenstrup et al 1987, Jackson et al 1989, Jepson 1989) recommend that women should wait until there is a cervical dilatation of about 5 cm before bathing, since it may influence the progress of labour; however, none of the authors have reported a randomised study to support their opinion. In a non-randomised study Lenstrup et al (1987) found faster cervical dilatation in the bathing group (2.5 cm/h) than in controls (1.25 cm/h), but the total duration of labour was comparable in both groups.

There is only one previous randomised study which has compared bathing with not bathing during labour (Cammu et al 1994). Their conclusion was that bathing women tended to require less oxytocin compared with those who did not take a bath, but the difference did not reach statistical significance. In their study, all the women had ruptured membranes before the bath. This is one possible explanation for the dif-

ferences with regard to oxytocin administration between their study and the present one.

The higher use of epidural analgesia in the women in the 'early bath group' compared with the women in the 'late bath group' was probably explained by the long time interval from established labour to delivery. Cammu et al (1994) concluded that a bath produced only a temporary pain-stabilising effect, but no objective pain relief. The majority of women in their study left the tube within one hour, and the main reason was that the labour pain became too intense. Because of the short analgesic effect of a bath, they believed that it was not probable that bathing would reduce the epidural rate during the first stage of labour.

An early bath together with oxytocin administration and epidural analgesia had no harmful effects on baby outcome in this study. From this point of view, there is no reason to change the mode of management of labour with regard to baths. A low infection rate, even after ruptured membranes, was found and this is in agreement with other studies (Lenstrup et al 1987, Waldenström & Nilsson 1992, Cammu et al 1994, Eriksson et al 1996). A number of factors are thought to have influenced the rate of infection in this study. First, this population was at low obstetric risk, and second, the interval from established labour to delivery was short in both groups. In addition, the baths in the delivery ward were not bubble-pools and were easy to clean, which may be an important factor in this context.

To conclude, a bath during labour should preferably be used after a cervical dilatation of 5 cm to avoid prolonged labour, and an increased use of oxytocin administration and epidural analgesia.

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	Group 1 (n = 100)	Group 2 (n = 100)	p*
Epidural analgesia	27	9	0.0015
Nitrous oxide	87	78	0.136
Paracervical nerve block	15	10	0.393
Sterile water paples	15	11	0.529
Oxytocin administration	57	30	0.0002

* Fisher's exact test.