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Antenatal perineal massage and subsequent perineal outcomes: a randomised controlled trial

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Objective To study the effects of antenatal perineal massage on subsequent perineal outcomes at delivery.

Design A randomised, single-blind prospective study.

Setting Department of Obstetrics and Gynaecology, Watford General Hospital.

Participants Eight hundred and sixty-one nulliparous women with singleton pregnancy and fulfilling criteria for entry to the trial between June 1994 and October 1995.

Results Comparison of the group assigned to massage with the group assigned to no massage showed a reduction of 6·1% in second or third degree tears or episiotomies. This corresponded to tear rates of 75·1% in the no-massage group and 69·0% in the massage group ($P = 0·073$). There was a corresponding reduction in instrumental deliveries from 40·9% to 34·6% ($P = 0·094$). After adjustment for mother's age and infant's birthweight these reductions achieved statistical significance ($P = 0·024$ and $P = 0·034$, respectively). Analysis by mother's age showed a much larger benefit due to massage in those aged 30 and over and a smaller benefit in those under 30.

Conclusion Antenatal perineal massage appears to have some benefit in reducing second or third degree tears or episiotomies and instrumental deliveries. This effect was stronger in the age group 30 years and above.

INTRODUCTION

Several studies have been undertaken to identify factors which may influence perineal outcome during childbirth. Variables which appeared to be related to perineal outcome, namely nulliparity, age greater than 20 years, length of second stage greater than one hour, epidural or pudendal anaesthesia, and specific indication for episiotomy (i.e. fetal distress and forceps delivery), have been identified in a previous study[1]. Birth position as a factor in perineal outcome has been considered by several researchers, but no clear association has been identified[2–6]. Birthweight, breech presentation, and occipitoposterior position also increase perineal trauma[1,5–7].

Much has been written about the effectiveness of antenatal perineal massage in reducing perineal tears at delivery. Information advocating the use of antenatal perineal massage is widely disseminated by many groups involved in childbirth. The National Childbirth Trust advocates its use in its pregnancy book, as does the Active Birth Centre[8]. Some midwives and doctors also recommend the practice.

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Of several studies concerned with antenatal perineal massage one examined the effects of two methods of teaching perineal massage and concluded that there was no difference between the instruction methods with respect to the practice of perineal massage. Episiotomy and laceration rates were also not affected by teaching method[9]. Another study randomly allocating 20 women to either a massage or no massage group concluded that women who practise perineal massage at least four times per week would have a lower incidence of episiotomies and lacerations that those who do not. The sample was very small and was not limited to a nulliparous population[10]. A later study compared 29 nulliparous women who practised perineal massage with a control group of 26. The study concluded that there was a statistically significant difference between the two groups and suggested that perineal massage might be one technique that would decrease the need for episiotomy. The sample was not randomised[11]. A more recent pilot study examined the feasibility of a randomised, controlled trial. Randomisation of 46 nulliparous women resulted in 91% compliance by those in the massage group and 100% by those in the no massage group and concluded that it was feasible to undertake a randomised, controlled trial to evaluate the

Table 1. Main reasons given for refusal (one per person) (n = 666).

Reason	n (%)
No antenatal visit between 32–34 weeks	332 (49·8)
Lack of interest	123 (18·5)
Midwife forgot	64 (9·6)
Wished to do/not do perineal massage	42 (6·3)
Unknown	29 (4·4)
Mother forgot	19 (2·9)
Social	18 (2·7)
Procedures unacceptable	17 (2·6)
Lack of time	12 (1·8)
Poor obstetric history	10 (1·5)

efficacy of perineal massage in preventing perineal trauma[12].

This study was carried out in response to an increasing interest in antenatal perineal massage by mothers and midwives in Watford. Although the practice was advocated by some midwives at the hospital there were others who needed research evidence before advocating its use.

METHODS

This single-blind, randomised, controlled trial took place at Watford General Hospital in Watford, Hertfordshire, England between June 1994 and December 1995. Approval for the study was given by the local ethics committee. There are approximately 3300 deliveries annually at Watford General and, on average, 1300 of these are primagravidas. Approximately 80% are vaginal deliveries with over half being delivered by midwives.

In order to achieve 80% power to identify a difference of 10% in perineal trauma in the massage group compared with no massage, at a significance level of 0·05, a study sample of 780 was required.

A computer based random number generator was used to allocate numbers 1–1200 at random to either the experimental or control condition (600 to each). These numbers were used to label envelopes containing materials appropriate to the allocated condition. The allocated condition of the envelopes was not apparent from either their weight or appearance and was not available to those conducting the study until the analysis stage. Subjects were assigned envelopes in the order in which they presented themselves to the research programme.

All nulliparous women were identified for possible inclusion in the study from hospital booking lists (n = 1687). Each woman was sent a letter asking her to see her community midwife at the clinic between 29 and 32 weeks of gestation to receive information about the study. Women living out of the area were asked to contact the trial research midwife directly for information. One hundred and sixty of the potential participants (9·5%) were excluded for any of the following reasons: multiple pregnancy, planned caesarean section, already performing perineal massage, premature delivery, medical conditions necessitating hospital admission, an allergy to nuts or nut products (massage oil supplied was sweet almond oil) or inability to speak and read English. Eight hundred and sixty-one (51·0%) consented to the study while the remaining 666 (39·5%) refused to participate. Reasons given for refusal were later confirmed in telephone interviews (Table 1).

Table 2. Demographic characteristics of study sample (n = 861). Values are given as n (%), excluding missing data.

Characteristics	n (%)
Marital status	
Married	626 (73·4)
Unmarried	227 (26·6)
Age in years	
< 20	35 (4·1)
20–29	474 (55·8)
≥ 30	340 (40·1)
Social class	
1 & 2	435 (51·2)
3–5	402 (47·3)
Armed Forces	12 (1·4)
Ethnic group	
Caucasian	786 (91·8)
Other	70 (8·2)

There were no differences between the consents, exclusions and refusals with respect to social class. The consent rate showed a small but statistically significant difference between the caucasian and the other ethnic groups. Of the caucasian group 60·6% consented compared with 51·5% of the other groups (P = 0·038).

Table 2 shows the socio-demographic breakdown of the women who formed the study sample.

Women who consented to the study were randomly allocated to either the massage or no massage group. Both groups were asked to perform pelvic floor exercises, which consisted of a group of four exercises four times in succession approximately every waking hour. The women were given a leaflet describing the exercises, and the midwife explained how they should be performed. Those in the massage group also received written information and verbal instruction about performing perineal massage (Appendix 1). The massage technique described in previous studies was taught by the attending midwife[10–11,13]. Women were asked to perform perineal massage three to four times a week for 4 min, starting six weeks before their estimated due date. A bottle of sweet almond oil BPC was provided to act as a lubricant when inserting the fingers into the vagina.

Women in both groups were asked to complete record sheets recording daily practice and a self-admin-

Table 3. Perineal status by treatment assigned. Values are given as *n* (%). OR = 1·36; 95% CI = 0·97–1·90; $P = 0·073$.

Perineal status	No massage ($n = 350$)	Massage ($n = 332$)
Intact	87 (24·9)	103 (31·0)
Tears	263 (75·1)	229 (69·0)

Table 4. Delivery type by treatment assigned. Values are given as *n* (%).OR = 1·30; 95% CI = 0·96–1·78; $P = 0·094$. SVD = spontaneous vaginal delivery.

Delivery	No massage ($n = 350$)	Massage ($n = 332$)
SVD	207 (59·1)	217 (65·4)
Instrumental	143 (40·9)	115 (34·6)

istered questionnaire within a day or two after delivery. The questionnaire covered, among other things, aspects of massage and exercise practice. In order to try to minimise bias, women were asked not to discuss their participation in the study with attending staff in labour and midwives in the labour ward were asked not to ask women whether or not they were taking part. Random checks by the trial research midwife indicated that the midwives were blind to the group allocation.

For each participant the length of actual pushing time was calculated from delivery records and the type of analgesia, birth position and use of syntocinon were noted. Following delivery, information about type of delivery, delivery attendant and perineal status was recorded. Estimated blood loss and infant's birthweight were also recorded.

Perineal trauma rates for individual midwives involved in the deliveries of study participants were compared with rates for nonstudy deliveries over the same period. This information was used to check whether women received care from midwives with comparable skills and would allow adjustment of the results if necessary.

Participants who delivered out of the area, did not have live births or had caesarean or pool deliveries were excluded from the final analysis. All analysis presented is based on an intention to treat basis. The results were analysed by comparison of proportions and logistic modelling using the Statistical Package for the Social Sciences (SPSS). Appropriate odds ratios (OR), significance tests and 95% confidence intervals (CI) were obtained.

RESULTS

Background factors

The effectiveness of the random allocation was examined by comparing the groups with respect to all relevant variables. Mother's age was greater in the massage group (mean 28·9 years; SD = 4·7) than in the no massage group (mean 28·1 years; SD 4·7) ($P = 0·039$). Infant's birthweight showed a significant relationship with mother's age ($P = 0·044$). Rates of perineal trauma and instrumental delivery increased with increasing age; for every year increase in age, perineal trauma increased on average by 7·3% and instrumental delivery by 6·6% ($P = 0·0002$ and $P = 0·0002$, respectively). Since mother's age and infant's birthweight were major determinants of perineal outcomes and delivery type they were included as adjustment variables in analyses of the results.

Of the participating women 66·3% returned antenatal record sheets and 97·9% completed the postnatal questionnaire. Questionnaire information revealed that 32·9% of the women assigned to the massage condition reported that they complied in full (i.e. frequency and duration of massage treatment), 52·1% partially complied and 15·0% did no massage at all. Some of the reasons given for noncompliance were: general ill health (cold or flu), thrush or vaginal discharge, baby came early, on holiday, admission to hospital, could not reach the area properly, did not like doing it or it hurt too much. One woman thought she had a choice of doing either the massage or the exercises, and two women stated that they had not been told to do the massage at all. Among those in the no massage group there were 19 (5·4%) who reported practising perineal massage.

The skill levels of the midwives delivering in the study, assessed by an audit of tear rates of nonstudy deliveries, did not differ between the massage and no massage groups.

Analysis

The numbers and percentage of deliveries with perineal trauma and instrumental deliveries in the massage and no massage groups are set out in Tables 3 and 4. In these and all tables the term 'Intact' includes intact perineum, first degree lacerations and nonperineal lacerations, 'Tears' refers to second and third degree lacerations and episiotomies, and 'Instrumental' refers to all vaginal instrumental deliveries.

The group assigned to massage showed a reduction of 6·1% in second or third degree tears or episiotomies compared with the group assigned to no massage. This corresponded to tear rates of 75·1% in the massage group and 69·0% in the no massage group ($P = 0·073$). There was a corresponding reduction in instrumental deliveries from 40·9% to 34·6% ($P = 0·094$).

A logistic model was used to adjust for mother's age and infant's birthweight. Following adjustment the OR for effect of massage on perineal trauma was 1·49

Table 5. Perineal status by age group (unadjusted). Values are given as *n* or *n* (%) unless otherwise indicated.

	No massage			Massage				
Age (years)	Intact	Tears	TOTAL	Intact	Tears	TOTAL	OR (95% CI)	*P*
< 30	65 (28·1)	166 (71·9)	231	60 (31·3)	132 (68·7)	192	1·16 (0·76–1·76)	0·336
≥ 30	22 (18·6)	96 (81·4)	118	43 (30·7)	97 (69·3)	140	1·93 (1·08–3·48)	0·019
TOTAL	87	262	349	103	229	332		

Table 6. Delivery type by age group (unadjusted). Values are given as *n* or *n* (%). SVD = spontaneous vaginal delivery.

	No Massage			Massage				
Age (years)	SVD	Instrumental	TOTAL	SVD	Instrumental	TOTAL	OR (95% CI)	*P*
< 30	148 (64·1)	83 (35·9)	231	130 (67·7)	62 (32·3)	192	1·18 (0·78–1·76)	0·432
≥ 30	58 (49·2)	60 (50·8)	118	87 (62·1)	53 (37·9)	140	1·70 (1·03–2·79)	0·036
TOTAL	206	143	349	217	115	332		

(P = 0·024; 95% CI 1·05–2·11) and on instrumental delivery the OR was 1·41 (P = 0·034; 95% CI 1·03–1·94).

The results for perineal outcome and delivery type for two age groups are set out in Tables 5 and 6. These show a reduction in tears of 3·2% for women < 30 years of age (P = 0·336) and 12·1% for those women ≥ 30 years of age (P = 0·019). There are reductions in instrumental deliveries of 3·6% and 12·9% in the two age groups (P = 0·432 and P = 0·036, respectively).

The benefit of massage was most apparent in those aged thirty or more where statistical significance was better than the 5% level. Further adjustments for age and birthweight made little difference to these results. In addition, the benefit could not be accounted for by differences in compliance between the younger and older women. Among those doing massage any differences in the OR due to the amount of massage carried out were too small to be detectable in this study.

Pushing time, length of second stage of labour, Apgar scores and distribution of delivery positions did not differ between the massage and no massage groups. Adjustments for age and birthweight and exclusion of deliveries aided by either epidurals or forceps did not affect these results.

DISCUSSION

The results of this study demonstrate an overall benefit for women in the massage group. There was a reduction in second and third degree tears and episiotomies of 6·1% and a reduction in instrumental deliveries of 6·3%. When adjusted for age and birthweight these differences reach statistical significance. Although there was a small but nonsignificant reduction in perineal trauma among those women having spontaneous deliveries, it may be that the reduction in perineal trauma is entirely dependent on the reduction in instrumental deliveries. A larger study is required to examine this issue.

The amount of benefit in terms of reductions in perineal trauma and instrumental deliveries was not as great over the entire age range as suggested by previous small scale studies. However, in women aged 30 years and over there was a significant reduction of 12·1% in perineal trauma and 12·3% in instrumental deliveries.

A possible explanation for the benefit of perineal massage on the reduction in instrumental deliveries and improved perineal trauma for older women is that there is less elasticity and suppleness in the tissues of these women. This would prevent the perineum from stretching as easily as in the younger nullipara. This is supported by the increased trauma rate with increased age.

A limitation of this study is that the sample was not large enough to look at differences in benefit due to the amount of massage actually carried out. An alternative to increasing the sample size would be to improve the completion rate of daily massage record sheets. In this study 66·3% were returned. Another possible limitation is the lack of information about the reliability of the assessments of perineal trauma.

Reduction in perineal trauma and instrumental delivery rate has obvious benefits for the mother. Reduction in perineal trauma reduces the pain and discomfort felt by women in the early postnatal period. This will encourage comfortable mobilisation, enjoyment of the newborn and possibly even breastfeeding. There may also be a reduction in the need for antibiotics.

There could also be benefits for the health service. The results of this study suggest that a small investment of time by midwives introducing massage antenatally could lead to fewer instrumental deliveries and a reduction in associated costs.

In comparison with national data the study sample has more social class one and two (51·2%) than in Great

Britain as a whole (39·3%), and a higher number of women aged 30 years and over giving birth for the first time (40·1% compared with 30·6%)[14]. The study population was predominantly caucasian, as in previous studies[10–11], and further research is needed on different ethnic populations. The benefit of perineal massage in the wider population could be less than that demonstrated in this study.

This study indicates a significant benefit from perineal massage for primigravid women 30 years and above. The introduction of perineal massage into antenatal care alongside pelvic floor exercises should be considered.

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Appendix 1: perineal massage instructions

Either you or your partner can do the massage. The first few times, take a mirror and look at your perineum (this is the area between the vagina and back passage, see diagram), so you know what you are doing. Wash your hands before beginning, make sure your bladder is empty, and position yourself comfortably. It is probably more comfortable to do the massage after a bath, as this will soften the surrounding tissues. You can do the massage in several positions—semi-sitting position, squatting against a wall, or standing with one foot raised and resting on the bath, toilet or a chair.

1. The massage should be done three to four times a week for 4 minutes, beginning six weeks before your baby is due.
2. Lubricate your fingers well with the almond oil provided. You need enough to allow your fingers to move smoothly over the perineum and lower vaginal wall.
3. If you are doing the massage yourself, it is probably easiest to use your thumb. Your partner can use both index fingers.
   a) Place the fingers or thumb about 2 inches [5 cm] into the vagina (up to the second knuckle).
   b) Using a sweeping motion with downward pressure, move in a rhythmic movement from 3 o'clock to 9 o'clock and back again. This movement will stretch the vaginal tissue and the muscles surrounding the vagina.
   c) You can also massage the skin of the perineum between the thumb and forefingers.
4. As you or your partner perform the massage, apply steady pressure downwards towards the back passage, until you feel a tingling sensation. This will help you recognise the sensation that you will experience when your baby's head begins to crown.
5. Use more oil if required to reduce friction.
6. Concentrate on relaxing your pelvic floor muscles as you massage.
7. In the beginning you will feel tight, but with time and practise the tissues will relax and stretch.
8. This massage should not be painful. Should you find it so please contact one of the study co-ordinators below for advice.
9. If the bottle of oil you have been given runs out, do not use any other oil or cream. Contact us and we will be pleased to give you another bottle.

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