

CLINICAL PAPER

Perineal trauma following vaginal delivery

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Abstract

Over 85% of women who give birth vaginally sustain some form of perineal trauma and 60–70% receive stitches. This study investigated the incidence and extent of perineal trauma with respect to a variety of risk factors within the Maternity Unit of Raigmore Hospital, NHS Highland, Inverness, UK, over a 3-week period. The authors also examined utilization of the treatments available within the Maternity Unit by medical staff and midwives, and attempted to establish whether up-to-date written patient information would be of value within the unit. Questionnaires and an audit form were used to gather information. Information was obtained for 74 of the 90 women who had vaginal deliveries during the study period. The results showed a questionnaire response rate of 42% and 31% for medical staff and midwives, respectively. It was found that treatment techniques such as pelvic floor muscle exercises, ice and advice regarding activities of daily living were not routinely given by all respondents. Because not all patients were seen by a physiotherapist postnatally, it was concluded that an up-to-date written patient information leaflet would be of value within the Maternity Unit at Raigmore Hospital.

Keywords: leaflet, perineal trauma, risk factors, treatment, vaginal delivery.

Introduction

Perineal trauma following vaginal birth is a common postnatal occurrence. It has been suggested that as many as 85% of women suffer some form of perineal trauma, with 60–70% requiring stitches (Kettle 2006). Kettle (2006, p. 1904) reported that:

‘Perineal trauma affects women’s physical, psychological and social wellbeing in the immediate postnatal period as well as in the long term. It can disrupt breastfeeding, family life and sexual relations.’

Glazener *et al.* (1995) stated that 7–10% of women continue to have long-term pain 3–18 months after delivery.

It is clear that the effects of perineal trauma can be lasting and, in some cases, severe, leading to significant dysfunction and distress for the individual involved. MacLeod & Murphy (2008) reported that, following operative delivery,

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short-term complications include perineal trauma, and consequently, pain, infection and potential haemorrhage; long-term effects include dyspareunia, incontinence of urine, flatus or faeces and prolapse.

Therefore, effective management is very important in the early postnatal period so as to minimize the impact of both the acute symptoms and any sustained effects caused by perineal trauma. Within the Maternity Unit at Raigmore Hospital, National Health Service (NHS) Highland, Inverness, UK, it was thought that perineal trauma may represent a significant postnatal complication, and in order to optimize physiotherapy management of this condition, a retrospective study was initiated in July 2008 to examine the incidence of perineal trauma and the care delivered.

Raigmore Hospital is the main acute general hospital in NHS Highland, which serves a population of approximately 240 000 people spread over a geographical area that is approximately equivalent to Belgium.

The Maternity Unit at Raigmore Hospital provides antenatal clinics, a day-case service,

parentcraft education, community midwifery services and in-patient maternity beds. The labour ward has seven delivery rooms, including one containing a birthing pool. A dedicated obstetric theatre is adjacent to the ward. There are two maternity wards, one catering for high-risk patients who require a greater level of medical intervention and the other being a midwifery-managed ward for low-risk patients. The Maternity Unit has a total 46 beds.

In 2007, there were 1947 births: 1150 (59%) were spontaneous vaginal deliveries; 518 (27%) were Caesarean sections; 171 (9%) involved forceps; 97 (5%) were ventouse deliveries; nine (0.5%) were vaginal breech deliveries; and 15 (0.8%) were water births.

The primary aim of the present study was to investigate the incidence and extent of perineal trauma with respect to a variety of risk factors within Raigmore Hospital Maternity Unit. The intention was to establish a baseline rate of perineal trauma following vaginal delivery at the hospital so as to facilitate optimization of post-natal management. Further aims were to investigate the utilization of treatments available within the unit by medical staff and midwives, and to establish whether up-to-date written patient information would be of value within the wing.

At present, the aim of the women's health physiotherapy team at Raigmore Hospital is to see all postnatal women, regardless of their mode of delivery, in order to give them advice and information to help their recovery following the birth of their babies. However, there is no 7-day physiotherapy service in place within the Maternity Unit, and because there is support for early discharge following delivery, some women are released before they have an opportunity to be seen by a physiotherapist. Therefore, the present authors also investigated the information that these women are given to help them with their postnatal recovery.

Subjects and methods

Audit tools were developed to record specific details relating to each vaginal delivery, and to capture information from medical staff and midwives. Medical staff were asked for information regarding specific intervention in women with differing degrees of tear.

Perineal tears are classified by the Royal College of Obstetricians and Gynaecologists (RCOG) in their Green-Top Guideline No. 29

Table 1. Classification of perineal tears (RCOG 2007)

Classification	Damage to external anal sphincter	Damage to internal anal sphincter	Damage to rectal mucosa
3a	<50%	Nil	Nil
3b	>50%	Nil	Nil
3c	>50%	Torn	Nil
4	>50%	Torn	Torn

(RCOG 2007) according to the level of damage that occurs. A third- or fourth-degree tear is one in which there is an injury to the perineum involving the anal sphincter. Table 1 contains details of the classification (Johnson & Rochester 2008). This classification is adhered to within the protocol for diagnosis and repair of anal sphincter tears utilized by the Raigmore Hospital Maternity Unit.

First-degree tears involve only the skin, while second-degree tears involve the skin and perineal muscle (Kettle 2006). Most spontaneously occurring perineal tears are classified as second-degree tears (Steen 2007).

Both medical staff and midwives were questioned about their routine care of patients with perineal trauma following vaginal delivery. Respondents were asked to indicate their practice in relation to: use of analgesia, use of ice, pelvic floor muscle exercises (PFMEs), advice on toileting for bladder and bowels, and advice for lifting and activities of daily living. These factors are regularly considered clinically and are supported by Sapsford *et al.* (1999) as being appropriate interventions in the management of perineal trauma.

Respondents were also asked their opinions on the usefulness of a postnatal leaflet, specific to recovery from perineal trauma following vaginal delivery. If supported, this would go some way to fulfilling the recommendations of Johnson & Rochester (2008), who investigated the involvement of physiotherapy following significant perineal trauma. These authors concluded that advice given to women should highlight the symptoms that may occur, and that there is a role for physiotherapy in the management of women who experience third- or fourth-degree tears.

Individual data collection forms gathered information relating to: maternal age, parity, induction of labour, type of delivery, length of the first and second stages, analgesia in labour, perineal trauma/episiotomy, suturing, birth weight, occipitofrontal circumference (OFC),

ethnic background, and an incontinence risk assessment score. A number of authors have suggested that these factors influence the risk of perineal trauma (Renfrew *et al.* 1998; Albers *et al.* 1999; Hanretty 2003).

Study period

The study period was 7 July 2008 to 25 July 2008. This period included two weekends during which there was no routine physiotherapy service.

Throughout this time, the Physiotherapy Obstetric Unit was fully staffed by one full-time-equivalent physiotherapist, i.e. 37 h per week, from Monday to Friday, equally divided between one band 6 physiotherapist (static), previously termed senior I physiotherapist, and one band 6 physiotherapist (rotational), previously termed senior II rotational physiotherapist.

Data collection

Audit forms ('Appendix 1') were completed by the present authors for all vaginal deliveries in the Raigmore Hospital Maternity Unit seen by physiotherapy staff within the study period. Details were extracted from the patient records.

Questionnaires ('Appendix 1') were sent to medical staff within the Maternity Unit, and internal mail envelopes were included to encourage the return of the completed forms. A total of 19 questionnaires were sent to medical staff, whose names were obtained from current on-call rota sheets.

Questionnaires ('Appendix 1') were also given to midwifery staff on the maternity wards. Thirty forms were left in each ward to cover the number of trained midwives in each location. This number was obtained from current off-duty sheets within the wards. Several verbal reminders were given to midwifery staff during the study period to encourage completion of the forms.

Both questionnaires were anonymous and instructions were included on the forms regarding the returns procedure. The medical staff could either return the forms to the Physiotherapy Department through the hospital's internal mail system or post them in the envelopes provided in the maternity wards. The midwives were encouraged to post their completed forms in the envelopes provided in the maternity wards. The envelopes were placed on the information notice boards in the wards. Large writing was used on the outside of

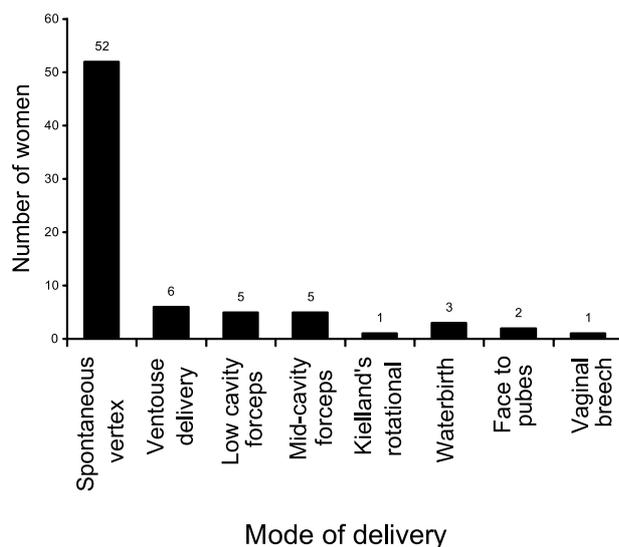


Figure 1. Mode of delivery of the study population.

the envelopes to facilitate the return of the completed forms.

Questionnaires were issued on the first day of the study period and were not collected until the Monday following the final study day (Monday 28 July). Any forms returned after this period were not included in the study.

Results

During the study period, there were a total of 117 births at Raigmore Hospital Maternity Unit. Ninety of these took the form of vaginal deliveries and 27 were by Caesarean section. Seventy-four audit forms were completed by physiotherapy staff during the 3-week audit. It was found that 27% of women included in the study had had their labour induced.

Figure 1 shows the modes of delivery within the study population. It should be noted that one twin delivery has been included in the study (these were recorded on one audit form).

The proportion of patients with perineal trauma following vaginal delivery is shown in Figure 2.

The only case of third-degree tear recorded during the study period was an 18-year-old primiparous woman who underwent a mid-cavity forceps delivery. No fourth-degree tears were recorded during the study period.

Table 2 provides further information about the percentage of patients in the present study who experienced perineal trauma following vaginal delivery and required suturing, i.e. 62% of all patients and 79% of primiparous women.

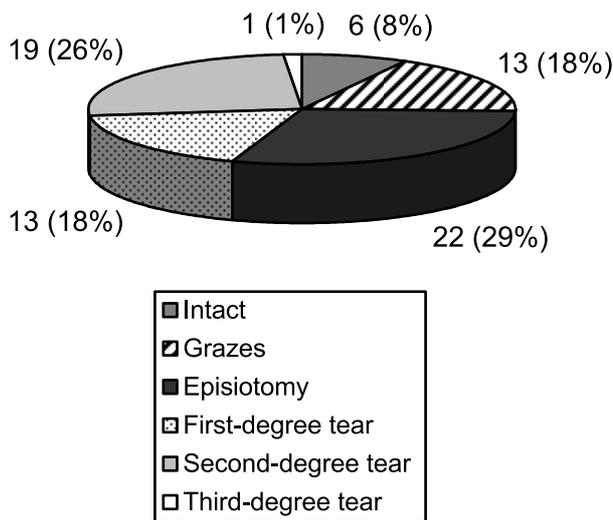


Figure 2. Incidence of perineal trauma during the study period.

Table 2. Perineal trauma recorded during the study period and percentage of suturing: (N/A) not applicable

Trauma category	Suturing
Intact	N/A
Grazes	0%
Episiotomy	100%
First-degree tear	31%
Second-degree tear	100%
Third-degree tear	100%
Fourth-degree tear	N/A

Data were collected regarding the parity of the women included within the study period (Fig. 3).

In addition to this, it was found that, of those women with a parity of 1+0, three had a vaginal birth after a Caesarean section. Data were not

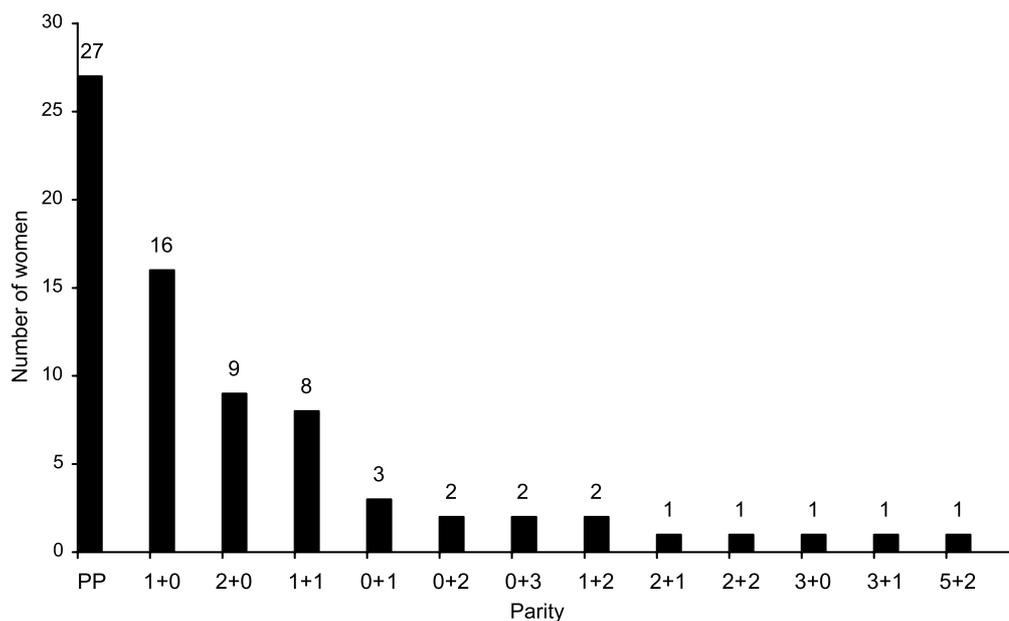


Figure 3. Parity of the subjects: (PP) primiparous.

Table 3. Further information from audit forms

Category	Average	Range
Age (years)	28	16–44
Length of labour (h):		
first stage	6	1–19
second stage	0:58	2:00–3:50
Birth weight (kg)	3.40	1.45–4.47
Occipitofrontal circumference (cm)	34.5	31–37
Incontinence risk assessment score	3	0–20

available on the collected audit forms for seven other women in this category of the present study.

Table 3 details further findings from the audit forms.

Information was also collected regarding the use of analgesia in labour. Nineteen per cent of the women included in the present study underwent an epidural anaesthetic, and 86% of these particular cases required suturing for perineal trauma.

The countries of origin of the women included in the present study indicated that 88% were British. The remaining 12% did not have English as their first language.

Medical staff questionnaires

Eight medical staff questionnaires were included in the present study. Five were sent to the Physiotherapy Department, all completed by consultants, and three were collected from the ward envelopes, two from consultants and one from a staff-grade doctor. Therefore, the overall response rate was 42% (100% from consultancy

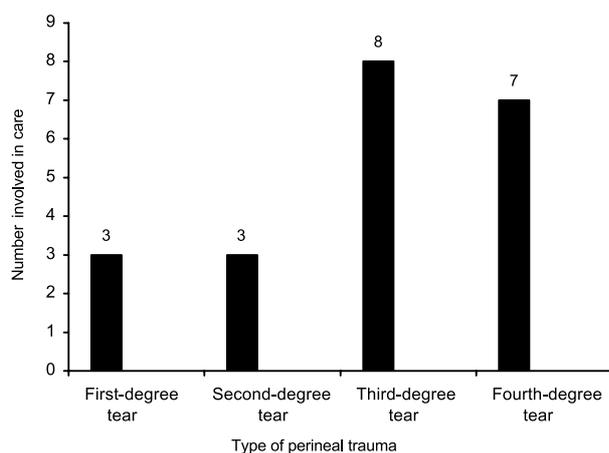


Figure 4. Types of perineal tear treated by medical staff.

staff). In response to question 1, i.e. whether they were involved in the care of postnatal women who experienced perineal trauma following vaginal delivery, all respondents answered ‘yes’. Question 2 asked the respondents to provide more details of the type of perineal trauma with which they were involved (see Fig. 4).

A more detailed examination of the questionnaires revealed that two respondents, both consultants, had stated that they were involved with all grades of perineal trauma. The staff-grade respondent only dealt with first-, second- and third-degree tears.

The results for questions 3 to 7 are detailed in Table 4.

In response to question 8, all eight respondents stated that a separate postnatal leaflet, specific to recovery from perineal trauma following vaginal delivery, would be useful.

A number of other comments were added at the end of the questionnaires and these are detailed in ‘Appendix 2’.

Midwifery questionnaires

The midwifery questionnaires were completed by the current staff of the maternity wards during the study period.

Overall, 16 questionnaires were completed and included in the present study. The total staff of trained midwives was 51, including bank staff, and therefore, this gave a response rate of 31%. The results for all respondents are shown in Table 5.

One respondent left the tick boxes for question 2 blank and wrote beside these that she had used to employ ice, but had now been advised against using it.

In response to question 6, all the midwives answered that a separate postnatal leaflet, specific to recovery from perineal trauma following vaginal delivery, would be useful.

There were several supplementary comments, which are detailed in ‘Appendix 2’.

Discussion

The present study provides a significant amount of information about patients at Raigmore Hospital who suffered from perineal trauma following vaginal delivery. It can be seen that 92% of women who had vaginal deliveries within the study period suffered from some degree of post-delivery perineal trauma, and thus, would have been at risk of both the short- and longer-term

Table 4. Medical questionnaire responses

If you are involved in the care of a postnatal woman who has perineal trauma following vaginal delivery, do you routinely . . .	Yes	No
3. give advice on the use of analgesia?	8	0
4. advise on the use of ice?	2	6
5. encourage pelvic floor exercises?	7	1
6. give advice on toileting for bladder/bowels?	6	2
7. give advice for lifting/activities of daily living?	5	3

Table 5. Midwifery questionnaire responses

When caring for a postnatal woman who has perineal trauma following vaginal delivery, do you routinely . . .	Yes	No
1. give advice on the use of analgesia?	16	0
2. give advice on the use of ice?	11	4
3. encourage pelvic floor exercises?	14	2
4. give advice on toileting for bladder/bowels?	16	0
5. give advice for lifting/activities of daily living?	4	12

dysfunctions associated with this condition. Intervention by a physiotherapist was indicated in a large proportion of these patients, and therefore, it is important to identify this need, and explore efficient and effective strategies to deliver appropriate physiotherapy care.

Mode of delivery, episiotomy and perineal trauma

Eleven per cent of the vaginal deliveries that were recorded at Raigmore Hospital during the study period were assisted with forceps and a further 8% were ventouse deliveries.

Research has shown that assisted deliveries are associated with an increased risk of third-degree tears (RCOG 2007), but only one subject in the present study suffered from such perineal trauma, a low rate of incidence that may be related to the small size of the study population. The average number of third-degree tears at the Maternity Unit is around 36 per annum, which equates to an average of three per month. This relatively low figure is equivalent to 2% of all deliveries at Raigmore Hospital, which compares favourably with the national average of around 3%, although up to 9% has also been reported (RCOG 2007).

There are many issues to consider in relation these patients, not just regarding their early postnatal recovery, but also in the longer term. If these women have a subsequent pregnancy, they will almost certainly be encouraged to undergo an elective Caesarean section in order to 'protect' the perineum and pelvic floor from further trauma. As operative deliveries, Caesarean sections carry additional risks and potential complications. In addition, these types of delivery are significantly more costly to the NHS and necessitate a longer period of convalescence. Further examination of third-degree tears at Raigmore Maternity Unit revealed that there was no correlation between the mode of delivery, the use of episiotomy, the size of the baby, OFC and the presence of third-degree tear following vaginal delivery. Anecdotally, midwives were confident that diagnosis of significant perineal trauma, particularly that affecting the anal sphincter, has improved in recent years. This is extremely important clinically since such postnatal women are more likely to receive appropriate advice, information and follow-up at the gynaecology clinic in the postpartum period.

An episiotomy was performed on 30% of the study population, which compares favourably to the rates reported by Williams *et al.* (1998), who

reported an overall UK episiotomy incidence rate of 40%. MacLeod & Murphy (2007) stated that episiotomy is traditionally a routine component of operative vaginal delivery, and is intended to avoid injury to the anal sphincter and minimize the risk of traumatic delivery for the baby. This finding was certainly echoed by the present results, which revealed that 94% of forceps and ventouse deliveries at Raigmore Hospital were accompanied by an episiotomy. The one case that did not fall into this category was a ventouse delivery in which a second-degree tear was documented as the associated perineal trauma. Of the remaining instances of episiotomy, only six were carried out with spontaneous vertex deliveries. This evidence reinforces the importance of the effective postnatal management of women who have an instrumental delivery to prevent long-term issues such as incontinence and dyspareunia.

Suturing and perineal trauma

Nearly as many women in the present study (26%) had a second-degree tear as had an episiotomy (30%) and it was interesting to note that all of these tears were sutured. Fleming *et al.* (2003) reported that perineal wounds are sutured in order to accelerate tissue repair, minimize infection and restore normal function. These aims are consistent with the aims of physiotherapy intervention in terms of minimizing acute symptoms and lessening the risk of more chronic dysfunction.

A modified version of Fleming's technique of continuous suturing is used for episiotomies and second-degree tears at Raigmore Hospital Maternity Unit. This is a method in which large pieces of tissue are stitched with continuous, non-locking sutures. The wound edges are approximated loosely to allow for swelling and the need for several layers of suturing material is avoided. Therefore, the subcuticular sutures are situated well below the surface of the skin, and consequently, these are more comfortable for the woman during activities such as sitting up when feeding her new baby. In turn, this reduces feelings of distress during the early postnatal period and enhances mobility. Compliance with physiotherapy may also be improved by early and definitive management of the acute soft-tissue injury.

Further risk factors and perineal trauma

The RCOG (2007) has reported several risk factors for significant perineal tearing, including

nulliparity, induction of labour, epidural analgesia and a second stage of labour lasting longer than one hour. In considering each of these risk factors in turn, it was found that 79% of primiparous women required suturing for perineal trauma following vaginal delivery. This is consistent with Kettle (2006), who found that perineal trauma is generally more extensive after a first delivery.

Of the women in the present study who had their labour induced, 38% had episiotomies and a further 19% had second-degree tears, all of which were sutured. This means that over half of the mothers who had their labour induced required suturing for perineal trauma. Additionally, only two women who were not having their first baby and who had to have their labour induced required an episiotomy for delivery. This highlights the importance of antenatal education for primigravid women, particularly with respect to PFMEs, since, in practice, many postnatal women with sutured and painful perineums are resistant to doing this particular form of exercise.

It was also possible to establish a link between epidural anaesthesia and suturing for perineal trauma. Of those women who underwent an epidural for analgesia in labour, 86% required suturing for perineal trauma. Less than one-third of first-degree tears were sutured, but all second- and third-degree tears were sutured, and therefore, it can be postulated that epidural users suffered greater perineal trauma. This may suggest that a lack of mobility during labour and the inability to optimize positions for delivery, such as high kneeling, may contribute to perineal trauma following vaginal delivery.

The overall average length of the second stage of labour was just under an hour, but after further analysis, it became clear that those women who had an episiotomy and second-degree trauma had an average second stage of 1:37 h. This factor correlates with previous work in relation to the development of stress incontinence. Sapsford *et al.* (1999) suggested that a prolonged second stage is linked to an increased incidence of stress incontinence, and the development of this condition can be attributed to sustaining perineal trauma at the time of delivery.

Foetal size and perineal trauma

Consideration was given to the influence of foetal size, but there was no relationship between the average size of the foetus and the incidence

of perineal trauma in the overall study population. Renfrew *et al.* (1998), Albers *et al.* (1999) and Hanretty (2003) all proposed a causal relationship between foetal size and perineal trauma, but this is not supported by the present results.

It could be that consideration of foetal size may be of more value in individual cases. For example, the heaviest baby included in the present study was 4.47 kg. This was the only recorded instance of rotational delivery by Keilland's forceps and an episiotomy was performed. The woman had an epidural for pain relief and her second stage lasted 3:50 h. This kind of information is clearly important when prioritizing women for physiotherapy intervention.

There was also no such relationship with respect to OFC and perineal trauma following vaginal delivery within this study population. Indeed, the largest recorded OFC was 37 cm. This subject was a primiparous woman who required no suturing to her perineum following delivery of her baby.

Ethnicity and perineal trauma

The audit forms also dealt with ethnicity. Kettle (2006) reported that white women are more at risk of perineal trauma, but this finding is not supported by the present results. Only 12% of the study population were not British and only three of those women were not Caucasian. Therefore, it was concluded that the numbers were not significant and no direct conclusions could be drawn.

For the purpose of the present audit, ethnicity was reported in terms of country of origin. It was decided that little useful information could be drawn from the relationship of ethnicity and perineal trauma, but that country of origin may be significant with respect to the language barrier that can exist between the woman having her baby and the midwife or doctor assisting her delivery. Chapman (2003) highlighted the importance of communication, particularly in relation to deliveries assisted by forceps or ventouse, and stated that explanations need to be clear and informative. The above author emphasized that plenty of support must be given to the woman and her birth partner, for whom such an experience may be frightening. This may be difficult if a language barrier exists.

Incontinence risk assessment score

The Physiotherapy Obstetric team at Raigmore Hospital use an incontinence risk assessment

score to objectively identify women who are at risk of incontinence following delivery. This was developed following a study carried out at Sandwell General Hospital, West Bromwich, West Midlands, UK, which identified various risk factors for postnatal incontinence (Dandy 1999). An assessment tool was devised to promote continence after childbirth.

The incontinence risk assessment score of each subject was determined as part of the present study. A score of three or more suggests that these women should have one-to-one instruction in PFMEs along with written information. The highest incontinence risk assessment score documented during the study was 20. This was for a patient with a third-degree tear who would be indicated for physiotherapy follow-up to reduce the risk of ongoing problems with pelvic floor dysfunction. In cases involving a third-degree tear, women follow a specific hospital regime of stool softeners and antibiotics, and are followed up routinely at the gynaecology clinic. However, there are also a significant number of mothers with a second-degree tear who are also at risk of developing pelvic floor dysfunction. These women may not be routinely reviewed following discharge from the maternity ward and community midwife. Therefore, these women should also be identified, and given appropriate advice and contact details for specialist physiotherapy should their symptoms persist beyond the initial postpartum period.

Questionnaire responses

The response rate for the medical staff questionnaires was very low, particularly with regard to more junior staff. However, a response rate of over 40% may be deemed acceptable (Hicks 2004, cited in Johnson & Rochester 2008). The 100% return rate from consultant medical staff was pleasing, as were the findings that they were all involved in the care of women with a third- or fourth-degree tear following vaginal delivery. This finding is in line with departmental protocol ('Appendix 3'), which states that, when a third- or fourth-degree tear is suspected, the registrar on call should examine the patient, and inform and discuss the case with the on-call consultant. Unfortunately, no registrar questionnaires were returned, and therefore, no data could be obtained. The staff-grade responses indicated involvement at first-, second- and third-degree tear levels, but not at the fourth degree. This may be because of the presumption of consultant involvement in the repair of fourth-degree tears.

Fourth-degree tears occur in only an estimated 0.05% of deliveries, as demonstrated by Rizvi & Chaudhury (2008). However, the RCOG reported that the combined incidence of third- and fourth-degree tears is between 0.6% and 9.0%.

The 31% return rate for the midwifery questionnaires was disappointing. As with the medical staff, the low response may be explained by the study taking place within the summer month of July, when a significant proportion of midwives were absent because of annual leave. A more detailed investigation of the actual number of staff present in the maternity wards during the study period could provide more accurate figures since the questionnaires were available only to midwives actually in the maternity wards at any one time. Another option would be to send the questionnaires individually to midwives in order to aid return, although this did not enhance return of more junior medical staff questionnaires.

Treatment of perineal trauma

Analgesia. As anticipated, the medical staff questionnaires showed that all respondents informed their patients of the benefits of appropriate and effective analgesia. This is important because, as Cooper *et al.* (2007) stated, effective treatment of acute pain must come high on the agenda of all staff who look after patients post-operatively. This finding was echoed in the midwifery questionnaires, in which all respondents routinely encouraged the use of analgesia for women with perineal trauma following vaginal delivery.

Ice. The respondents had mixed views about the use of ice in perineal trauma. Only 25% of medical staff supported this treatment compared to 69% of midwives. Meeusen & Lievens (1986, cited in Gallie *et al.* 2003) stated that cold therapy dates from the fourth century BCE, when it was advocated by Hippocrates. Ice is the commonest form of local treatment for perineal pain and is administered in the form of ice packs (Sleep & Grant 1987, cited in Sapsford *et al.* 1999). Two midwives reported that they had previously used ice, but were subsequently recommended not to employ it. Work by Grant *et al.* (1989) suggested that the use of ice may delay healing. More recently, Brayshaw & Wright (1994) stated to the contrary that ice, if applied correctly, is a valid treatment for the painful perineum.

Pelvic floor muscle exercises. It was found that 12.5% of respondents did not routinely promote PFMEs for women with perineal trauma following vaginal delivery, although the RCOG (2007) stated that these exercises are effective in reducing postnatal urinary incontinence. Numerous studies advocate PFMEs for women with perineal trauma. Swelling and bruising follow episiotomy and repair of perineal tear. Pelvic floor muscle exercises involving the contract-relax technique are an efficient pump mechanism to increase circulation and decrease oedema. Sleep & Grant (1987, cited in Sapsford *et al.* 1999) found that perineal pain was lessened at 3 months post-partum in women who had performed more intensive PFMEs. All postnatal women should be encouraged to do PFMEs, particularly those who have suffered perineal trauma. Physiotherapists study in-depth anatomy and physiology of exercise, and are well placed to provide advice to postnatal women regarding these exercises. Medical staff and midwives also have knowledge of this very important muscle group and are in a position to advise patients. The National Institute for Health and Clinical Excellence (NICE) guidelines on postnatal care recommend that advice and information regarding PFMEs should be given at each patient contact to aid recovery in the postnatal period (NICE 2006). The present study revealed that 18% of patients were not seen by an obstetric physiotherapist following vaginal delivery. However, all caregivers within the Maternity Unit should recognize the importance of encouraging postnatal women to do PFMEs.

Bladder/bowel advice. All midwives surveyed in the present study were found to routinely give advice regarding toileting, as compared to 75% of the medical staff who responded. As previously mentioned, urinary incontinence and, to a lesser degree, faecal incontinence can be a consequence of vaginal delivery. Indeed, Sapsford *et al.* (1999) detailed the many changes occurring in pregnancy, and stated that vaginal delivery can be a catalyst for lifelong change in bladder and bowel function. If required and in line with NICE Guidelines (2006), appropriate treatments should be instituted and follow-up arranged. In relation to anorectal disturbances, Sapsford *et al.* (1999) reported that these too are frequently transient and that appropriate defecation technique should be taught, together with perineal support, to increase comfort.

Midwives and physiotherapists are ideally placed to educate postnatal women on these matters. Johnson & Rochester (2008) highlighted the importance of follow-up after third- or fourth-degree tears at consultant-led clinics at 6–12 months postnatally. This is also recommended by the RCOG and is included within the protocol for Raigmore Hospital Maternity Unit. This follow-up is particularly important with respect to the symptom of faecal incontinence, which is the most commonly reported complication associated with third- and fourth-degree tears (Johnson & Rochester 2008). Women will often not readily volunteer this as a problem, perhaps because of embarrassment; they are more likely to address the issue when attending a designated clinic.

Lifting/activities of daily living advice. Only 38% of respondents stated that they provided routine advice to women with perineal trauma following vaginal delivery. Interestingly, a higher percentage of medical staff were found to give this advice compared to midwives (63% versus 25%). One midwife indicated that she 'tended to give lifting advice to ladies following Caesarean section'. Much of the evidence available considers lifting and activities of daily living in relation to back care. Consultant obstetricians are well aware of the impact of lifting on the PFMs in relation to their work with patients following pelvic floor repair in gynaecology, and this may be a possible reason for the high levels of advice given by this group (71% of consultants). The NICE (2006) guidelines state that all women should be offered advice on exercise and planning activities in the postnatal period (i.e. 24–168 h). Physiotherapists have traditionally been associated with back care, and moving and handling advice, so they are ideally suited to provide advice and education in relation to this.

All respondents stated that a patient information leaflet specific to the management of perineal trauma following vaginal delivery would be useful. Indeed, in Green-Top Guideline No. 29, the RCOG (2007) advocates this. Furthermore, the NICE (2008) guidelines state that sources of written information are highly valued, and in order to meet individual women's needs, it is likely that a variety of ways of giving information will be required. Therefore, an evidence-based leaflet issued in the early postnatal period would be of benefit in promoting recovery from the symptoms of perineal trauma.

Given that this is a time of enormous change in lifestyle, particularly with a first baby, the woman would have some advice and information to keep and refer to at her leisure. The NHS Highland policy relating to patient information leaflets requires these to carry the name and contact details of the lead clinician compiling the leaflet. This allows any woman experiencing ongoing problems following the early post-partum period to contact a specialist physiotherapist in their area.

Conclusion

Comparing the present findings with those of current research reveals many parallels. It can be seen that the incidence of episiotomy and perineal trauma in primiparous women following vaginal delivery at Raigmore Hospital Maternity Unit is largely similar to previous research findings. When examining suturing, it was found that all second-degree and some first-degree tears were sutured, which is an area where the research is divided. The most interesting fact was the high correlation between perineal trauma and epidural use. This may be a consideration in educating antenatal women with respect to use of an epidural for pain relief in labour.

The incontinence risk assessment score was considered by the present authors to be of importance because the average risk score of the study population encouraged one-to-one intervention regarding PFMEs and continence advice.

The questionnaire responses show that women who suffer from perineal trauma as a result of vaginal delivery are given appropriate information regarding analgesia, PFMEs, and advice regarding toileting for bladder and bowels. The use of ice highlighted some issues and it is clear that it may be under-used in the management of this type of patient. It was also apparent that there was a lack of information given to women with perineal trauma regarding lifting and activities of daily living. This is an area that would be easily rectified through the issue of an appropriate leaflet. Although the obstetric physiotherapist would consider all of these issues in the management of postnatal women, the present service at Raigmore Hospital is such that not every postnatal woman is seen. Therefore, a leaflet would be of significant benefit in the management of women suffering from perineal trauma following vaginal delivery.

Recommendations

The present authors make the following recommendations:

- A written information leaflet for issue to women with perineal trauma following vaginal delivery should be produced.
- Teaching sessions for medical staff and midwives should be conducted to encourage the increased use of ice for perineal pain in the postnatal period.
- Alternative methods of gathering information from medical staff and midwives should be considered to increase the response rates in future studies.
- Greater patient awareness of perineal trauma antenatally should be promoted, particularly with respect to epidural analgesia in labour.
- The language barrier in relation to perineal trauma should be explored.
- Further research involving a larger study population should be carried out over a longer time period.

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Appendix 1

AUDIT OF PERINEAL TRAUMA POST-DELIVERY

Age: _____

Parity: _____

Induction of Labour?: _____

Type of Delivery: _____

Length of 1st Stage: _____

Length of 2nd Stage: _____

Analgesia in Labour: _____

Perineal Trauma/Episiotomy: _____

Suturing?: _____

Birth Weight: _____

OFC: _____

Ethnic Background: _____

Incontinence Risk Assessment Score: _____

Medical Staff Questionnaire

The Obstetric Physiotherapy service is currently undertaking an audit of postnatal women with respect to management of perineal trauma post-delivery. The impact of perineal trauma on long-term continence is well documented and we feel it is important to encourage education in this area. We are therefore very keen to gather the opinion of Medical Staff to facilitate the delivery of a comprehensive service to these women.

We would be very grateful if you would take a couple of minutes to complete a short questionnaire.

Grade _____

1. Are you involved in the care of postnatal women who have perineal trauma following vaginal delivery?

Yes No

2. If yes, do you provide specific intervention in women with a tear defined as (please tick as appropriate):

1st degree? 2nd degree? 3rd degree? 4th degree?

If you are involved in the care of a postnatal woman who has perineal trauma following vaginal delivery, do you routinely (please tick)...

Yes No

3. give advice on the use of analgesia?

4. advise on the use of ice?

5. encourage pelvic floor exercises?

6. give advice on toileting for bladder/bowels?

7. give advice for lifting/activities of daily living?

8. In your opinion, would a separate postnatal leaflet, specific to recovery from perineal trauma following vaginal delivery, be useful?

Yes No

Please add any further comments below:

Many thanks for your time.

Karen Brandie/Ali MacKenzie (Obstetric Physiotherapy)

Midwifery Questionnaire

The Obstetric Physiotherapy service is currently undertaking an audit of postnatal women with respect to management of perineal trauma post-delivery. The impact of perineal trauma on long-term continence is well documented and we feel it is important to encourage education in this area. We are therefore very keen to gather the opinion of Midwives to facilitate the delivery of a comprehensive service to these women.

We would be very grateful if you would take a couple of minutes to complete a short questionnaire.

When caring for a postnatal woman who has perineal trauma following vaginal delivery, do you routinely (please tick)...

- | | Yes | No |
|--|--------------------------|--------------------------|
| 1. give advice on the use of analgesia? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. advise on the use of ice? | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. encourage pelvic floor exercises? | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. give advice on toileting for bladder/bowels? | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. give advice for lifting/activities of daily living? | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. In your opinion, would a separate postnatal leaflet, specific to recovery from perineal trauma following vaginal delivery, be useful? | <input type="checkbox"/> | <input type="checkbox"/> |

Please add any further comments below:

Many thanks for your time.

Karen Brandie/Ali MacKenzie (Obstetric Physiotherapy)

(Please put your completed questionnaires in the envelope provided in the maternity wards)

Appendix 2

Comments from medical staff questionnaires:

- ‘Specific information (written) regarding third- and fourth-degree tears would be helpful.’
- ‘We have guidelines on the intranet for the care of third-degree tears.’

Comments from midwifery questionnaires:

- ‘Advice to reduce anxiety regarding when to commence intercourse. Also self-examination – how and when to do this post-delivery when recovering.’
- ‘Ice – not routinely, but at times. Activities of daily living – not routinely, but at times.’
- ‘We do not recommend ice for perineal trauma as we were told it could slow down healing. Any new evidence to the contrary? Tend only to give advice about lifting activities to Caesarean section [patients].’
- ‘Only advise ice on swollen perineum for 24 h.’
- ‘Type of stitches – dissolvable. May fall out – don’t panic if see one in the bath. Ice packs – use for short periods (e.g. a few minutes).’
- ‘[Leaflet] DEFINITELY! [useful].’
- ‘[Advise on the use of ice] if very tender/sore. Sometimes speak to the physio regarding curapuls if perineum particularly painful.’
- ‘Probably assume physiotherapist gives more advice.’

Appendix 3

Anal sphincter tear: diagnosis and repair

When anal sphincter tears are identified, the following protocol should be followed.

Definition:

- A third-degree tear involves partial or complete disruption of the anal sphincter:
 - (3a) <50% thickness of the external sphincter involved;
 - (3b) full thickness of the external sphincter involved; and
 - (3c) internal sphincter also torn.
- A fourth-degree tear is a third-degree tear with additional disruption of the anal mucosa.

Pre-theatre management:

- The registrar on call should examine the patient and confirm the anal sphincter injury.

- The registrar should inform the on-call consultant and discuss the case.
- The registrar should explain the situation to the patient.
- The registrar should inform the duty anaesthetist and organize the theatre.

Management in theatre:

- All repairs should be performed in theatre under general or, preferably, regional anaesthesia.
- Repair should be performed by a suitably trained practitioner.
- Thoroughly cleanse the area.
- Site the Foley catheter.
- Good light, exposure and assistance are essential to accurately assess and repair the tear (take assistance from a scrub nurse and a senior house officer).
- The sphincter repair tray should be used.
- Evaluate the full extent of the injury.
- Intra-operative intravenous cefuroxime 1.5 g and metronidazole 500 mg should be employed. This regime can be used for patients who are allergic to penicillin; however, if there has been a *serious* penicillin allergy, i.e. urticaria, angio-oedema, immediate rash or anaphylaxis, then cefuroxime should be replaced by an infusion of 600 mg clindamycin.

Choice of sutures:

- Anal mucosa is best repaired with 3/0 Vicryl, with the knots tied in the lumen.
- Both the internal and external anal sphincter should be repaired with 3/0 polydioxanone.
- The vaginal epithelium and perineal muscle should be repaired with 2/0 Vicryl Rapide.

Documentation:

- Fully document the procedure in the operation notes.
- Note any anal mucosa involvement.
- Note the extent of internal and external sphincter involvement.
- Note the type of technique (e.g. overlap or approximation of external anal sphincter) used.
- Note the sutures used.
- Note the blood loss/swab count.

Post-operative management:

- Post-operative oral antibiotics should be used as follows: 250 mg cefalexin three times daily

for 7 days and 400 mg metronidazole three times daily for 7 days.

- This regime can be used for patients wishing to breast-feed.
- If the patient is allergic to penicillin, then oral 150 mg clindamycin should be used 6 hourly for 7 days.
- Laxatives should be prescribed as follows: 10 mL lactulose twice daily for 7 days and one sachet of Fybogel twice daily for 7 days.
- Remove the catheter after 24 h.

All patients with third- or fourth-degree tears should be reviewed 4 months postnatally at their consultant's gynaecology clinic.

Management in ward:

- Patients should be managed on Ward 10 and reviewed daily by medical staff.

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