

Postpartum Perineal Pain in the Absence of Obstetric Anal Sphincter Injuries: A Prospective Observational Study

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OBJECTIVE The purpose of this study was to identify the prevalence of perineal pain at early postnatal period and to assess the association between maternal, obstetric or neonatal variables and perineal pain.

METHODS Three hundred and six women were followed up for perineal pain with present pain intensity (PPI) and visual rating scale (VRS) components of the validated short-form McGill pain scale. Multivariate logistic regression was performed to identify which characteristics of the patients and neonates were independent determinants of perineal pain.

RESULTS The incidence of perineal pain at days 1 and 7 postpartum was 88.2% and 24.9%, respectively. PPI was mild 63.1% (day 1) and 23.9% (day 7), moderate 24.2% and 1.1%, and severe 1% and 0%. VRS score was 2 (1-3) at day 1 and 0 (0-1) at day 7 postpartum, respectively. Perineal pain was more common in primiparous women with higher BMI, more maternal weight gain, received epidural analgesia, and use of episiotomy. In a multivariate logistic regression model, only episiotomy predicted the pain at day 1 postpartum (RR=2.05, 95% CI 0.95-4.42) suggesting that women with mediolateral episiotomy experienced more intense pain than women with median episiotomy.

CONCLUSIONS In the absence of obstetric anal sphincter injuries, although perineal pain during the early postnatal period is prevalent, the intensity is slight. Moreover, the use of episiotomy is associated with more perineal pain than other perineal trauma.

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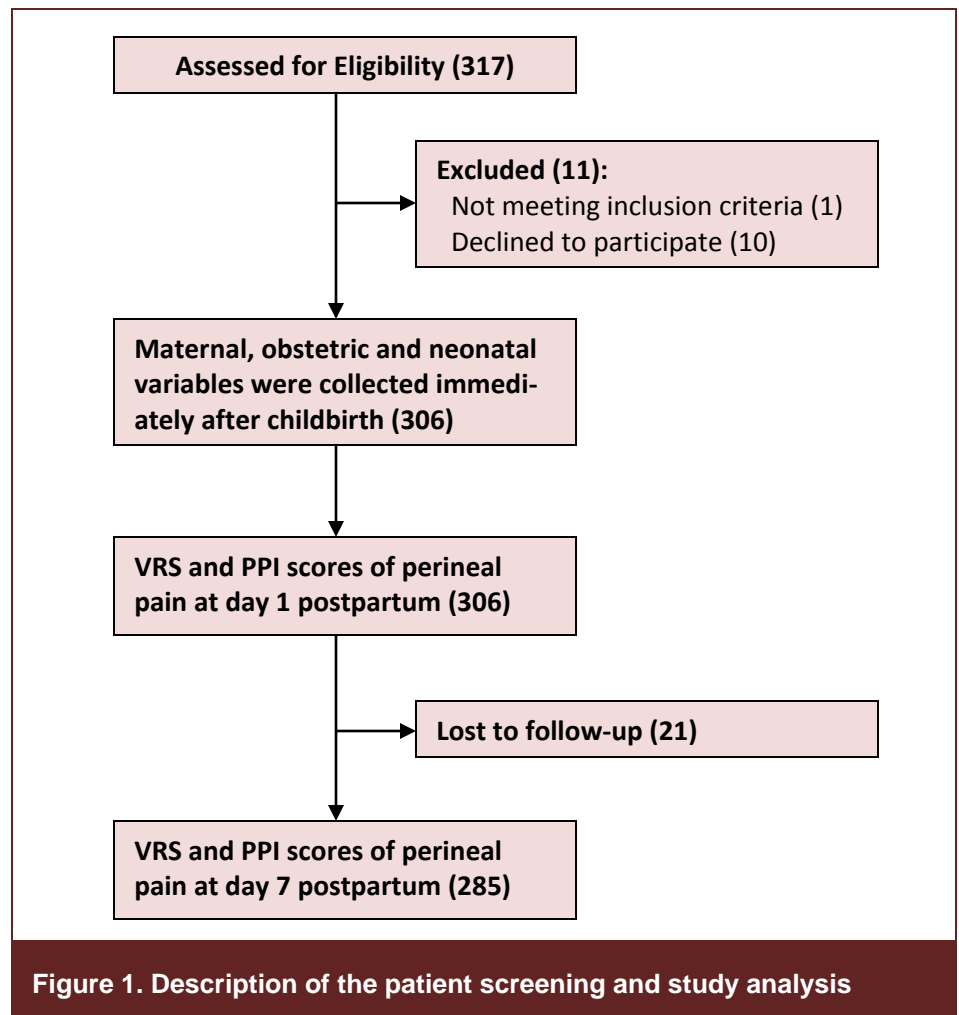
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POSTPARTUM perineal pain is an inevitable consequence of birth and may induce many physical and psychological disorders. Perineal pain can impact on women's daily activities including sleep patterns, urinary and bowel function, and providing practical care of their infants (1). Acute severe postpartum pain may even predict persistent pain and postpartum depression (2). Despite the negative impact on women's daily activities, postpartum perineal pain is usually neglected by caregivers and not reported by women who may consider it to be a normal outcome of childbirth. Alleviation of postpartum perineal pain is of particular importance for caregivers and new mothers.

Incidence of postpartum perineal pain is likely to be influenced by the extent of perineal trauma that is usually classified as episiotomy, first or second-degree laceration as well as third or fourth-degree laceration, which refers to in the presence of partial or complete obstetric anal sphincter injuries (OASIS). Women who had partial or complete OASIS often reported more frequent and severe postpartum perineal pain than women with an intact perineum, first- or second-degree tear, or episiotomy (3, 4). However, in some institutes, limited attention has been paid to postpartum perineal pain with respect to its morbidity and associated risk factors.

Robust evidence has shown that the outcomes of perineal trauma are associated with diverse obstetric interventions including episiotomy, operative delivery, pushing methods, and prolonged expulsive period (5). Otherwise, maternal and neonatal variables such as maternal age, parity, ethnicity as well as fetal birth weight, position of the baby at the time of birth may also be confounding factors for some obstetric interventions (6, 7). Our study aims to determine the incidence, severity, and risk factors of perineal pain in women without OASIS.



SUBJECTS AND METHODS

This prospective cohort study was conducted at tertiary university hospital in China. After approval by the Ethics Review Committee, the study was carried out over a 4-month consecutive period, with subjects recruited and followed up by anesthesiologists. Eligible women were those who gave birth to a single, live, term fetus vaginally and were in hospital for at least 24 hours after childbirth. Written informed consents of subjects were obtained immediately after childbirth.

Maternal variables included age, parity, BMI, and maternal weight gain. Obstetric variables included labor analgesia method (epidural analgesia or not), mode of delivery (spontaneous or operative vaginal delivery), and grade of perineal trauma. All women had undergone a detailed perineal and rectal examination after

birth. Women with perineal trauma had had their trauma sites sutured. Suture technique (continuous suture for perineal skin and interrupted suture for perineal muscle layers and vaginal mucosa) and suture material (delayed absorbable polyglactin) were both standardized in our institution. Neonatal variables included neonatal birth weight and infant position at birth.

The prevalence and severity of perineal pain at day 1 (by interview) and day 7 postpartum (by telephone) was assessed using the PPI and VRS components of the validated short-form McGill pain scale (8). Women were specified that pain from their abdomen (uterine involution) or rectum and anus (hemorrhoidal pain) were not to be included. The four-point Likert scale for the PPI is none, mild, moderate, and severe. Among the 11-point VRS, a score of zero is considered 'no pain' and ten 'the

Table 1. Perineal pain at day 1 and day 7 postpartum assessed with VRS and PPI

Pain assessment	Perineal pain		P-Value
	Day 1 postpartum (n=306)	Day 7 postpartum (n=285)	
Pain on VRS	2(1-3)	0(0-1)	< 0.001
PPI			
None	36 (11.7)	214 (75.1)	< 0.001
Mild	193 (63.1)	68 (23.9)	< 0.001
Moderate	74 (24.2)	3 (1.1)	< 0.001
Severe	3 (1)	0 (0)	0.25

VRS, visual rating scale; PPI, present pain intensity

worst possible pain'. If women required postnatal pain relief, ibuprofen 400mg was given orally.

Statistical analysis was performed with SPSS 16.0 software (SPSS Inc., Chicago, USA) to explore possible associations between maternal, obstetric, and neonatal variables and perineal pain. Descriptive statistics with normal and skewed distribution were expressed as mean \pm standard deviation and median (interquartile range, IQR), respectively. Chi square test or Fisher's exact test of significance was used for cross tabulations. Student's *t*-test was used to compare mean values in variables with normal distribution and Mann-Whitney for variables with a non-normal distribution. Finally, a multivariate logistic regression model with stepwise process and selection was used to identify independent predictors associated with women's reports of perineal pain. In the univariate analysis, we selected a significance level of $P < 0.05$. In constructing the final logistic regression model for the multivariate analysis, with process selection and stepwise, we included variables that presented as significant at $P < 0.10$. This level was set arbitrarily to identify independent predictors of pain.

RESULTS

Between August and November of 2012, a total of 317 eligible women had been invited. Ten of them declined to participate in from uninvestigated reasons. Another subject was

proved to have a partial thickness external anal sphincter laceration and was excluded from further analysis. Finally, 306 women were thus prospectively enrolled and followed up at day 1 and day 7 postpartum. All of them responded on day 1 and 285 (93.1%) on day 7 postpartum. Mean response time was 24.4 ± 3.7 hours and 7.3 ± 0.9 days following the birth, respectively. A flowchart of women recruitment and study analysis is shown in Figure 1.

The incidence of perineal pain was relatively higher at day 1 than day 7 postpartum during which 270 women (88.2%) experiencing perineal pain at day 1 declining to 71 (24.9 %) at day 7. However, the severity of perineal pain was slight. When assessed with the PPI scale, 74.8% and 98.9% of women experienced none or mild perineal pain at day 1 and day 7 postpartum, respectively. The proportion of women who chose more severe intensity terms (moderate and severe) at each time point was only 25.2% and 1.1%, respectively. Furthermore, when assessed with VRS, the intensity of perineal pain was also lower, just 2 (1-3) at day 1 and 0 (0-1) at day 7 postpartum, respectively (Table 1).

There was a statistically significant difference regarding parity, BMI, and maternal weight gain among the women who reported perineal pain. Women who reported perineal pain at day 1 postpartum were more likely to have decreased parity, have a higher BMI, and have gained more weight in

pregnancy (all $P_s < 0.05$). No statistically significant differences between maternal age and perineal pain outcomes were found. Otherwise, statistically significant differences were observed between perineal pain and epidural analgesia, as well as the use of episiotomy (all $P_s < 0.05$) (Table 2). No statistically significant differences were observed between reports of perineal pain and mode of delivery, nor were there any differences regarding infant variables including neonatal birth weight and infant position at birth. Only use of episiotomy remained as an independent predictor of perineal pain in the final logistic regression model (RR 2.05, 95% CI 0.95-4.42).

In our study, a total of 266 women (86.9%) had perineal trauma according to a detailed perineal and rectal examination. Episiotomy was performed with 129 women (42.2%) having this incision, with a mediolateral incision recorded in the majority (Table 3). No women were documented as having partial or complete OASIS. Either at day 1 or day 7 postpartum, women experiencing the mediolateral episiotomy had a higher VRS score than those with median episiotomy. On the PPI scale, when perineal pain was dichotomized into 'none or mild' versus 'moderate or severe', pain intensity in women experiencing the mediolateral episiotomy was higher than those with median episiotomy at day 1 postpartum, of which no longer existed at day 7 postpartum (Table 4).

Table 2. Perineal pain at day 1 postpartum and its association with maternal, obstetric, and neonatal variables

Variable	Perineal pain		P-Value
	No (n=36)	Yes (n=270)	
Age (y)	28.7 ± 4.7	28.4±3.2	0.75
Primiparity	26 (72.2)	248 (91.9)	<0.001
Body Mass Index (BMI, kg/m ²)	25.4±2.8	26.7±2.8	0.009
Maternal weight gain (kg)	13.7±2.7	15.5±4.1	0.014
Epidural analgesia	27 (75)	243 (90)	0.023
Operative delivery	0 (0)	9 (3.3)	0.605
Perineal trauma			
Episiotomy	3 (8.3)	126 (46.7)	<0.001
No episiotomy	33 (91.6)	144 (53.3)	
Neonatal birth weight (g)	3238±391	3321±351	0.185
Occiput anterior	34 (94.4)	260 (96.3)	0.639

All women with perineal trauma (n = 266) chose ice packs and warm packs for postpartum analgesia. However, only 2 of them with uncomplicated episiotomy and 3 using episiotomy combined with forceps had received postpartum pain reliever on the ward.

DISCUSSION

This prospective observational study followed up 306 postpartum women to determine the incidence and severity of perineal pain during the short postnatal period and to identify associations between maternal, obstetric, and neonatal variables and perineal pain in the absence of OASIS. Our results indicated that in the absence of OASIS, a large proportion of women experienced perineal pain during the short postnatal period, but the pain intensity is slight. Perineal pain is associated with not only maternal characteristics (parity, BMI, and maternal weight gain) but also obstetric interventions during labor (epidural analgesia and use of episiotomy). Of note, we have shown that use of episiotomy is a significant predictor of perineal pain.

Although in the absence of OASIS, 88.2% of the 306 women in our study experienced perineal pain within 24 hours after childbirth, a proportion not lower or even higher than reports in

the presence of OASIS (9-11). However, the intensity of perineal pain was slight assessed with PPI and VRS. Assessed with the PPI scale, 74.8% of women experienced none or mild perineal pain and a mean VRS score was only 2(1-3) at day 1 postpartum. This perineal pain intensity was lower than that in the study of East *et al* (9), of which 90% of women reporting some perineal pain with 37% moderate or severe. Similarly, our perineal pain intensity was also lower than that in another report of Asian women, in which the majority reported their perineal pain as being moderate to severe at day 1 after childbirth (12). At day 7 postpartum, only 24.9% of women in our study reported perineal pain, with the majority only mild. This percentage was significantly lower than the report of the Macarthur *et al.* (11), of which nearly 60% of women still reported perineal pain at day 7 postpartum. Increased postpartum perineal pain is highly associated with increased perineal trauma outcomes as demonstrated by others (3, 4, 11). So, we think that the relative lower intensity of postpartum perineal pain in our study may be partially explained by the absence of OASIS which is usually considered as the most severe perineal trauma.

Our findings on the association between episiotomy and perineal pain are in line with other studies. A study of 303 postnatal women which identified the severity and prevalence of perineal pain, higher pain scores in the immediate postnatal period was highly associated with the use of episiotomy (10). Another study of 119 primiparous women which compared pain outcomes following episiotomy, intact perineum and first- and second-degree laceration found more severe perineal pain among the episiotomy group (13). Others have reported less postpartum perineal pain among women who have less perineal trauma. Leeman *et al.* (14) found less pain among women with intact perineum than women who had a second-degree laceration, and Macarthur *et al.* (11) presented at seven days postpartum that 38% of the women in their study had an intact perineum reported pain compared with 60% of women who had first and second-degree tear and 91% of women with a third or fourth degree tear. Episiotomy has been considered correlated with a high incidence of pelvic floor morbidity such as sexual dysfunction, pelvic floor relaxation, and third- or four-degree laceration (15, 16). A episiotomy rate higher than 30% cannot be justified



Table 3. Perineal trauma outcomes

Outcomes	N	%
No trauma	40	13.1
1° laceration	68	22.2
2° laceration	69	22.5
Episiotomy		
Mediolateral	86	28.1
Median	43	14.1
Total	306	100

(17). However, the episiotomy rate in our study is 42.2%, a relative higher percentage compared with other parts of the world (18). The importance of effective clinical practice to decrease the episiotomy rate is clear in our institute.

In our study, women with mediolateral episiotomy had increased perineal pain compared to women with median episiotomy assessed with PPI and VRS. This result was different from a recent report of Fodstad *et al.* (19), in which these two types of episiotomy showed no significant difference regarding the perineal pain or blood loss at day 1 after childbirth. Other than the influence of different pain measurement scores, there were only 20 and 38 women respectively using median and mediolateral episiotomy in above mentioned study, of which the sample size may not be large enough to detect a difference in pain scores due to the lack of power analysis.

We need acknowledge one potential limitation of our study. The classi-

fication of the perineal trauma grade, in our institution, refers to that one subject was proved to have partial thickness external anal sphincter laceration after a detailed perineal and rectal examination during the 2-month observational period. However, in the absence of sophisticated anal endosonographic examination by the obstetricians or midwives, it is possible to misclassify the perineal trauma. Some studies have suggested that clinical evaluation of the perineum may significantly underestimate the exact OASIS (20). This misclassification may underestimate the true correlation between perineal trauma and perineal pain.

In summary, in the absence of OASIS, perineal pain after vaginal delivery was prevalent and slight, and was highly associated with episiotomy. In clinic practice, the benefit and risk of episiotomy need to be weighed and the use of episiotomy should be optimized. ■

CONFLICT OF INTERESTS

None

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AUTHOR CONTRIBUTIONS

Shiqin Xu conceived and designed the experiment, and performed analysis with constructive discussions. Xian Wang collected and analyzed the data, as well as wrote the manuscript.

Shanwu Feng contributed significantly to statistical analysis and manuscript preparation.

ABBREVIATIONS

OASIS: obstetric anal sphincter injuries; PPI, present pain intensity; VRS, visual rating scale; BMI, body mass index; RR, relative risk; CI, confidence interval

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Table 4. Perineal pain in women with mediolateral and median episiotomy at day 1 and day 7 postpartum

Pain assessment	Mediolateral episiotomy	Median episiotomy	P-Value
At day 1 postpartum			
Pain on VRS	3 (2-3.25)*	1 (1-2)**	< 0.001
None or mild pain on PPI	34 (39.5)	39 (90.7)	< 0.001
At day 7 postpartum			
Pain on VRS	1 (0-1)†	0 (0-0)††	< 0.001
None or mild pain on PPI	75 (96.1)	39 (100)	0.55

VRS, visual rating scale; PPI, present pain intensity

*: n = 86; **: n = 43; †: n = 78; ††: n = 39

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