



Perineal Trauma in Primiparous Women with Spontaneous Vaginal Delivery: Episiotomy or Second Degree Perineal Tear?

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Abstract

Objectives: To estimate the incidence of perineal trauma in primiparous women with spontaneous vaginal delivery and to identify the factors associated with second-degree lacerations.

Materials and Methods: A subset analysis of women with spontaneous vaginal deliveries (n=489) from an institutional review board-approved parent study in healthy, nulliparous, continent pregnant women, attending the public health care system of Catalonia (northeast Spain). Primary outcome measure was perineal trauma according to the RCOG classification. For the bivariate analysis, the Student's t-test, ANOVA and the chi-squared test, or the corresponding non-parametric tests were used. Rates, relative risks and odds ratios (multivariate analysis) were estimated along with 95% confidence intervals (CI).

Results: About 91% (95% CI: 88-93%) of women with vaginal deliveries showed some degree of perineal trauma. Nulliparous women with spontaneous deliveries who did not undergo an episiotomy were 9 times more likely to present a tear (any grade) than those who received an episiotomy [Relative risks (RR) = 9.6, 95% CI: 6.3%-14.6%, P<0.001]. Only episiotomy reached statistical significance in bivariate and multivariate analyses (P<0.0001), revealing the protective effect of episiotomy respect to second-degree tear.

Conclusion: The absence of episiotomy was the only variable independently associated with second degree perineal tears, showing a clear protective effect.

Keywords: Episiotomy, Parity, Vaginal birth

Introduction

Historically, the use of episiotomy was common for primiparous women in order to prevent severe perineal trauma. Paradoxically, reviews indicate the opposite: episiotomy may actually contribute to severe perineal trauma rather than protect against it (1-4). Although current practice favours a reduction in episiotomies, perineal trauma rates remain high because of the increase in first and second degree tears (2,5,6).

Prevalence rates of third and fourth degree perineal lacerations ranges widely from 0.3% to 6% or approximately 1.7% of all births (2.9% in primiparous). Most studies focus on the incidence and the risk factors of more severe perineal trauma including the anal sphincter (7-10). However, few studies have evaluated the incidence of perineal tears that do not affect the anal sphincter.

Perineal tears are common following spontaneous vaginal deliveries and practically inevitable in forceps-assisted births (11). Even in mild tears, second degree perineal trauma deserves special consideration as it affects the muscular structure. The muscular damage classified as a second degree tear is equal to or worse than that which results from a routine episiotomy, if it affects the levator

ani muscle. A published study on the correlation between episiotomy or perineal tears and pelvic disorders in women who had delivered vaginally 5 to 10 years earlier, concluded that perineal tear was a risk factor for pelvic floor dysfunction but that episiotomy was not (12).

Only a small percentage of primiparous women will have an intact perineum after vaginal delivery. There is no data that analyzes the association between episiotomy and mild perineal trauma in primiparous women with spontaneous vaginal delivery. Knowing whether or not an association exists and being able to analyze the risk factors associated with mild perineal tears, would help us reach a better understanding of the appropriate use of episiotomy.

The study aimed to estimate the incidence of different types of perineal tears [as classified by the Royal College of Obstetricians (13)] in a group of primiparous women with spontaneous vaginal delivery and to identify factors that could be associated with the presence of second degree perineal trauma.

Materials and Methods

This study is a subset analysis of women who had spontaneous vaginal deliveries from an institutional review

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board-approved parent study in healthy, nulliparous, continent pregnant women, attending the public health care system of Catalonia (northeast Spain). Women were selected at the beginning of their gestations and followed during pregnancy and postpartum with the aim of describing the natural history of urinary and anal incontinence, and identifying the associated risk factors. They were informed of the objectives and nature of the study and signed an informed consent freely, and withdrawal from the study at any time during follow-up was not precluded.

A total of 1128 nulliparous pregnant women were included and delivery data were obtained from 938 of those recruited initially. The rate of vaginal delivery was 76.8% (n=720), with a total of 489 spontaneous deliveries (67.9% of the vaginal deliveries). Features of the parent study population and methodological details have been reported elsewhere (14). The current study is based on data obtained from the 489 women with spontaneous deliveries. Demographic and obstetrical variables included: maternal age, weeks of gestation, baseline body mass index (BMI), weight gain in pregnancy, induction, anaesthesia, cephalic position, episiotomy, type of episiotomy, perineal tears and degree, birth weight, and head circumference.

Primary outcome measure

For the purpose of the current study, perineal trauma was defined as any damage to the genitalia (skin, muscle, and fascia) during childbirth, either spontaneously or due to an episiotomy. Classification of perineal tears was first, second, third or fourth degree, according to the classification of Royal College of Obstetricians and Gynecologists: First degree: injury to perineal skin only; second degree: perineum and perineal muscles affected, but not involving the anal sphincter; third degree: injury to perineum involving the anal sphincter complex; and fourth degree: injury to perineum involving the anal sphincter complex and anal epithelium.

Categorical variables were described as frequencies and percentages. Incidence rates of episiotomy and perineal tear, and their corresponding confidence intervals (95% CI), were calculated. The association of second degree tears with demographic and obstetrical variables was estimated through bivariate and multivariate analyses. Relative risks (RR) and odds ratios (OR), respectively, as well as their 95% CI were obtained.

Only women with a singleton fetus were included in the analysis (8 twin pregnancies were excluded). A $P \leq 0.05$ was considered as statistically significant.

Results

A total of 720 vaginal deliveries were registered in the parent study (nulliparous cohort), 489 of which were spontaneous deliveries with the data below. The remaining were considered as assisted because of the use of forceps (n=136), spatulas (n=72), vacuum extraction (n=15), and breech presentation (n=4). In four cases the information was missing.

About 91% (95% CI: 88%-93%) of primiparous women with spontaneous vaginal deliveries showed some degree of perineal trauma. Figure 1 depicts these data.

The estimated episiotomy rate for all vaginal delivery in the nulliparous cohort was 72.8% (95% CI: 69.4%-76.1%) and the perineal tear rate was 31% (95% CI: 27.3%-34.7%). The occurrence of tears, with and without episiotomy, in spontaneous vaginal deliveries is summarized in Table 1. 87.5% of the diagnosed tears in spontaneous vaginal deliveries occurred in the absence of episiotomy (Table 1). According to our data, nulliparous women with spontaneous deliveries who did not undergo an episiotomy were 9 times more likely to present a tear (any grade) than those who received an episiotomy (RR = 9.6, 95% CI: 6.3%-14.6%, $P < 0.001$).

The estimated episiotomy rate for spontaneous vaginal delivery in the nulliparous cohort was 63.4% (95% CI: 59.0%-67.8%) and the perineal tear rate was 35.3% (95% CI: 30.7%-39.9%). In spontaneous vaginal deliveries with episiotomy, a high proportion of primiparous women (92%; 95% CI: 88.5%-95.5%) did not have a recorded tear compared to 76.4% (95% CI: 69.8%-83.0%) of those without an episiotomy. On the other hand, the rate of tear without episiotomy was 86.3% (95% CI: 80.6%-92.1%). In the nulliparous cohort, the rate for an intact perineum af-

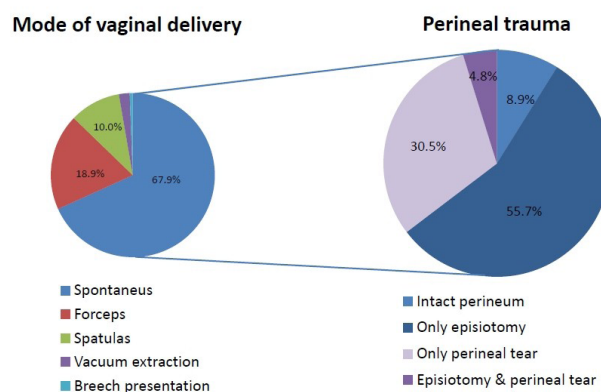


Figure 1. Perineal trauma in vaginal deliveries (nulliparous cohort).

Table 1. Degree of tears, by presence or absence of episiotomy, in spontaneous vaginal deliveries

Tears	No. (%) ^a
With episiotomy	19 (12.5)
• First degree	11 (52.4)
• Second degree	8 (38.1)
• Third degree	0 (0.0)
Without episiotomy	133 (87.5)
• First degree	90 (51.5)
• Second degree	41 (23.4)
• Third degree	2 (1.1)

^aSome percentages do not add up to 100 due to missing values

ter a spontaneous delivery was estimated to be 9.4% (95% CI: 7.0%-12.5%).

When the association between second degree tears and some demographic and obstetrical variables were assessed, only episiotomy reached statistical significance ($P < 0.0001$), revealing the protective effect of episiotomy to prevent a perineal trauma in primiparous women.

When considering spontaneous deliveries, the occurrence of episiotomy was the only significant variable in bivariate analyses (RR=0.20; 95% CI: 0.12%-0.33%; $P < 0.0001$) showing a protective effect; moreover, the risk of second degree perineal tear attributable to the absence of episiotomy was 80.0%. In multivariate analyses, episiotomy remained as the unique factor statistically associated with second degree tears (OR=0.035; 95% CI: 0.012%-0.097%; $P < 0.0001$); that is, the absence of episiotomy significantly increased the risk of that type of perineal trauma (OR=28.57; 95% CI: 10.31%-83.33%; $P < 0.0001$) in primiparous women. These estimates were adjusted by BMI, maternal age and birth weight (Table 2).

Discussion

Ninety-one percent of primiparous women in this cohort study who had spontaneous vaginal deliveries experienced some form of perineal tear, whether with episiotomy or spontaneous perineal tear (or both). The high rate of perineal trauma is an important fact if we consider that postpartum morbidity is directly related to the extension and severity of perineal trauma (15).

A clear and specific evidence based recommendation on usage of restricted episiotomy exists (1), although there is no consensus as to what is considered appropriate as far as the rate of episiotomy. Carroli states that a rate of more than 30% would not be justified in the context of restrictive use of episiotomy considering all vaginal deliveries (16). However, the absence of an episiotomy does not guarantee an intact perineum, and in most primiparous normal deliveries in which episiotomies are not performed the result is usually a second degree perineal tear. The restrictive use of episiotomy that leads to a decrease in this type of intervention could have long-term consequences similar to those that were trying to be avoided by the systematic performance of this procedure (12).

The most important limitation found in comparing groups and rates of episiotomies lies in the lack of sufficient data exclusively for primiparous women. In this sense, our work is valuable as it presents a cohort of primiparous women with spontaneous vaginal delivery. Furthermore, most studies focusing on primiparous women include a relatively small sample (4,17,18); according to these studies, the rate of episiotomies for primiparous women (including spontaneous and instrumental deliveries) following a selective episiotomy practice ranges between 20.9% (19) and 53%. The overall rate of episiotomy by spontaneous vaginal delivery in current study is 63.4% (95% CI: 59.0%-67.8%). These results can be considered high when compared to Robinson et al. study which cited an episiotomy rate of 40.6% in a cohort of 1576 primipa-

Table 2. Risk factors for second degree tears in spontaneous vaginal deliveries

	Crude RR (95% CI)	AOR ^a (95% CI)
Age [>35 y]	1.40 (0.65-3.02)	2.297 (0.572-9.223)
BMI (kg/m ²) (Overweight/Obesity)	1.23 (0.69-2.19)	1.406 (0.525-3.768)
Episiotomy	0.20 (0.12-0.33)	0.035 (0.012-0.097)
Birth weight (>3500 g)	0.82 (0.43-1.57)	0.762 (0.263-2.208)

RR: Relative Risk; CI: Confidence Interval; OR: Odds Ratio; BMI: Body Mass Index

^aMultivariate analysis (logistic regression model)

rous women with spontaneous vaginal deliveries (20).

There is a correlation between the percentage of first and second degree perineal tears (non-severe perineal trauma) and the rate of episiotomies, as this type of perineal tear is higher when no type of episiotomy is performed (2). In fact, with the adoption of a restrictive episiotomy practice the interest in studying risk factors and preventing spontaneous perineal trauma has increased. The perineal tears or lacerations that require suture have increased gradually as the amount of episiotomies decrease; in one USA study 41% of women who underwent vaginal deliveries in 2003 suffered spontaneous tears (5). In a recent study, the rate of perineal lacerations in primiparous with no episiotomy was 56.7% and suture was necessary in 30% of them. The only factors associated with increased risk of need for suture were primiparity and instrumental delivery (21).

Approximately two-thirds of the primiparous women with spontaneous vaginal deliveries experienced some degree of trauma that affected the perineal muscles, whether was caused by episiotomy or by a spontaneous second degree tear. Thus, only one-third of the primiparous women in this study with spontaneous vaginal deliveries presented first degree or no perineal trauma.

Considering perineal tears, three-fourths were diagnosed in the absence of an episiotomy, resulting almost all in non-severe perineal trauma. Consequently, our study has found evidence of the clear protective or preventive effect of episiotomy with respect to second degree tears for primiparous women. This association with a decreased risk of spontaneous perineal trauma was also evidenced in other studies (22,23). Potentially as much as 80% of the second degree tears in spontaneous deliveries could have been prevented or avoided if an episiotomy had been performed. Women who did not undergo an episiotomy were 28.5 times more at risk of presenting second degree tears than those who did undergo an episiotomy.

No additional obstetric factors related to second degree perineal tears (other than episiotomies) were collected in our study which impedes the identification of other risk factors for second degree perineal lesions in which a preventive episiotomy would be justified. It is important to point out that these variables were not considered as an objective of this study, a factor which presents an important limitation. In a Swedish study, factors associated to this type of trauma were identified as being perineal edema, high fetal weight, advanced maternal age and pro-

longed delivery time (>60 minutes) or shortened (<30 minutes) (24). Another study demonstrated a significant association between the head circumference of the infant and trauma extending into the perineal muscles (second degree or deeper) in nulliparous women, although the effect was modest (25).

The issue to be considered is whether it is beneficial to reduce the rate of episiotomies in primiparous women at the expense of an increase in spontaneous perineal trauma. Based on current evidence, it is not possible to establish concrete protocols on when an episiotomy is indicated in a spontaneous vaginal delivery. Although in common obstetric practice, episiotomy may be more closely related to different professional styles, local recommendations or experience, training and individual preference, than to the individual differences of each woman at the time of delivery.

Thus, the rate of perineal trauma should be minimized as much as possible with restrictive use of episiotomy, but also assuming and informing primiparous women of the high risk muscular structures being affected following their first vaginal delivery (as a consequence of an episiotomy or a spontaneous perineal tear).

Conclusion

The purpose of this study was to compare the rate of perineal trauma and tears and whether episiotomy had a protective effect in primiparous women with spontaneous vaginal delivery. Most primiparous women had documented perineal trauma which, although not considered severe, may affect the muscular perineum structures. The absence of episiotomy was the only variable independently associated with second degree perineal tears; therefore, episiotomy showed a clear protective effect on this type of spontaneous perineal trauma.

Ethical issues

The participants were informed of the objectives of the study and signed an informed consent freely. The protection of privacy of those participating in research was also considered.

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Conflict of interests

None declared.

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