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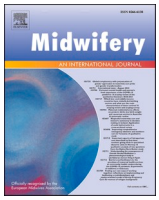

The severity of second-degree perineal tears and perineal pain during three months postpartum: A prospective cohort study

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ABSTRACT

Background: Second-degree perineal tears are common and can vary widely in the extent of tissue trauma. Therefore, a better understanding of perineal pain based on tissue trauma severity in second-degree tears is needed.

Aim: The primary aim of this study was to assess differences in perineal pain according to the severity of perineal tears, with a focus on subcategories of second-degree tears, during the first three months postpartum. The secondary aim was to assess the use of pain medication and breastfeeding patterns according to the severity of the second-degree tears.

Methods: In this observational cohort study, nulli- and multiparous women with singleton pregnancies were included during pregnancy. After birth, perineal tears were classified using the latest international classification system. In addition, second-degree tears were subcategorised according to percentage of damage to the perineum (<50 %=2A,>50 % but less than entire perineum=2B, affecting entire perineum, anal sphincter not involved=2C). Perineal pain, use of pain medication and breastfeeding patterns were assessed during a phone interview seven to ten days postpartum and through an electronic questionnaire three months postpartum.

Findings: Out of 880 vaginal births, 852 participants completed the phone interview and 715 answered the electronic questionnaire. During the first three months postpartum, women with 2C-tears reported statistically significantly higher pain scores and more frequent use of pain medication compared to women with 2A-tears. There was no statistically significant difference between the number of participants not breastfeeding between second-degree tear subcategories.

Conclusion: Women with 2C-tears reported higher perineal pain scores and more use of pain medication compared to those with less severe tears during three months postpartum.

Introduction

During the first three months after birth, women experience multiple physical, social and psychological changes. They recover from childbirth, adjust to changing hormones, establish breastfeeding routines, and care for their newborns (American 2018). During this important period of a woman's life, perineal pain is commonly reported (Manresa et al., 2019; Andrews et al., 2008; Åhlund et al., 2019). There is a negative association between women's experience of perineal pain and their self-reported positive childbirth experience (Chang et al., 2016). Perineal pain may affect women's mobility (Andrews et al., 2008), mental well-being, and quality of life, increase the risk for depressive symptoms (Chang et al., 2016) and impact the transition to parenthood (Åhlund et al., 2019). Pain may make sitting uncomfortable, which can negatively influence breastfeeding (Andrews et al., 2008; East et al., 2012). According to the latest international classification of perineal tears, second-degree tears involve the perineal muscles, and third- and fourth-degree tears involve the anal sphincter muscles (Royal 2015; Sultan, 1999). Thus far, research has focused on perineal pain following of third- and fourth-degree tears (Andrews et al., 2008; Royal 2015; Macarthur and Macarthur, 2004). In contrast, second-degree perineal tears, have received little attention (Manresa et al., 2020). However,

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these tears can vary widely in the extent of damage to the perineum. A recent meta-analysis highlighted the need for subcategorising second-degree perineal tears to better understand perineal pain following childbirth (Manresa et al., 2019). The impact of perineal tears on breastfeeding has been inadequately investigated, and the few existing studies have produced inconclusive results (Andrews et al., 2008; Agea-Cano et al., 2020). In this context, in the delivery ward at Akershus University Hospital, Norway we have implemented a reliable subcategorization of second-degree tears based on the percentage of damage to the perineum (2A, 2B or 2C) (Olsson, 2016; Ussdal et al., 2019; Macedo et al., 2022). This enabled us to evaluate perineal pain, the use of pain medication and breastfeeding patterns according to the severity of tissue trauma within second-degree tears.

The primary aim of this study was to assess differences in perineal pain according to the severity of perineal tears, with a focus on subcategories of second-degree tears, during the first three months postpartum. The secondary aim was to assess the use of pain medication and breastfeeding patterns according to the severity of the second-degree tears.

Participants, ethics and methods

Setting

This observational cohort study was conducted at Akershus University Hospital in Norway. Akershus University Hospital is a tertiary referral hospital with the second-largest delivery ward in Norway. Approximately 75 midwives assist 4800 births annually. The caesarean section rate in the hospital during the study period was 17 %, which is in accordance with the national numbers (Medical 2023).

Participants

All nulli- and multiparous women meeting the inclusion criteria, were invited to participate when attending the hospital for routine prenatal ultrasound examinations at 18 weeks of gestation between October 2020 and January 2022. Inclusion criteria were singleton pregnancy and being able to understand one of the Scandinavian languages. Exclusion criteria were female genital mutilation, and for multiparous women, caesarean section or third- and fourth-degree perineal tears in one of the previous births. In this analysis, participants with missing classification of second-degree tears according to the study-protocol, participants with miscarriage/stillbirth or caesarean section in present birth were excluded.

Exposure measurements

Exposure measurements was perineal tears. Immediately after birth, perineal tears were classified by inspection and palpation of the tear by a midwife or an obstetrician. Tears were classified using the College of Obstetricians and Gynecologists' classification-system, with an extended detailed classification for second-degree tears (Royal 2015; Sultan, 1999). In short: all superficial tears not affecting the perineum were defined as first-degree tears, and second-degree tears were subcategorized based on the percentage of damage to the perineum (<50 % =2A, >50 % but less than the entire perineum=2B, and affecting the entire perineum but not including the anal sphincter =2C) (Åhlund et al., 2019; Macedo et al., 2022). In cases of multiple perineal tears, the most severe tear was used for analysis. All types of perineal tears may also include vaginal tears. Episiotomies were analysed separately. Therefore, participants with perineal tears who also had an episiotomy, were categorised under episiotomy for analysis. Mediolateral or lateral episiotomies were performed (Laine et al., 2020). All second-degree tears and episiotomies were sutured by a midwife, or for more complicated tears by an obstetrician, using a continuous and/or interrupted suture technique immediately after birth according to national guidelines (Laine et al., 2020). Standard analgesia for perineal repair involved infiltrating the wound area with xylocaine/adrenaline at 10 mg/ml. In some cases, a pudendal nerve block was performed.

Outcome measurements

The primary outcome measurement in this study was perineal pain (Shelly, 2023). The secondary outcomes were the use of pain medication and breastfeeding patterns. Outcome measures were assessed through a structured phone interview seven to ten days postpartum and through an electronic questionnaire three months postpartum. All participants were asked the same questions in the same order, with predefined answers (Blackman and Funder, 2002). Most interviews were carried out by the first author of the paper, some by the second author. A link to the electronic questionnaire was sent out by email three months postpartum.

Perineal pain was quantified during the interview and through the electronic questionnaire, by using the 11-point numeric rating scale (NRS-11) (Karcioglu et al., 2018). The participants were asked 'On a scale from 0 to 10, how much pain are you experiencing? 0 indicating no pain and 10 being worst imaginable pain.' During the interview, the term 'perineal pain' was specified as pain in the area between the vagina and the anus. Further, it was specified that abdominal pain or pain from the rectum was not to be included. Information about the use of pain medication in the preceding 24 h was obtained during the phone interview seven to ten days postpartum. Participants were asked: 'Do you use pain medication?' (yes/no). If yes, the follow-up questions were: 'What kind of pain medication?' (paracetamol/acetaminophen; non-steroidal anti-inflammatory drugs (NSAIDs); others: tramadol hydrochloride or codeine-based analgesics) and 'How much pain medication have you used within the last 24 h?' Analgesic dosages were calculated in units to facilitate a comparison of the frequency of use among different pain medications. One unit was defined as the lowest available dosage of the respective agent: 500 mg paracetamol, 200 mg ibuprofen, 250 mg naproxen, 25 mg diclofenac, 50 mg tramadol hydrochloride and 400 mg/30 mg paracetamol/codeine.

Seven to ten days and three months postpartum, participants were asked 'Do you breastfeed?' (yes/no), and the number of breastfeeding sessions was assessed (less then daily, daily one or two times, daily three times or more). Participants who answered that they breastfed less than daily were classified as 'not breastfeeding'. Additionally, at seven to ten days postpartum the participants were asked 'Does perineal pain make it difficult for you to breastfeed? To find an optimal breastfeeding position?' (yes/no).

The characteristics and birth outcomes were collected from the participants medical records and through an electronic questionnaire at inclusion at 18 weeks of gestation. Hormonal contraception and tobacco use were assessed through the questionnaire administrated three months postpartum.

Statistical analysis

Statistical analysis was performed using IBM SPSS Statistics version 28.0. The Characteristics and birth outcomes are presented as frequencies with percentages and means with standard deviations (SDs), respectively. The distributions of perineal pain scores are presented as means with SDs according to the classification of perineal tears. To assess differences in perineal pain due to second-degree tears, a one-way Anova or Kruskal-Wallis test was used. A multiple linear regression analysis was performed to assess perineal pain of more severe second-degree tears (2B or 2C) compared to 2A-tears. Confounders were selected based on the existing literature and clinical reasoning. Only factors interfering with both perineal tears and perineal pain were included as confounders: age, body mass index, parity, ethnicity, operative vaginal delivery, length of second stage of labour and birthweight (Ananth and Brandt, 2022). Frequencies with percentages of

participants using pain medication, participants not breastfeeding, and participants with difficulties finding the optimal breastfeeding position are presented. For statistical analysis a chi-square test was performed. Units of pain medication used are reported as means±SD and were tested statistically using a Kruskal-Wallis test. As this study was an observational cohort study, the sample size was determined by the number of women responding to the phone interview and electronic questionnaire. A power calculation for this analysis was not perfomed.

Ethics

Ethical approval was granted by the Regional Medical Ethics Committee for Medical Research, Norway (No. 116 952) on 19 May 2020 and by the Norwegian Centre for Research Data (NSD) (No. 20/05527) on 20 August 2020. All participants received detailed information about the study orally and in writing. All participants provided informed written consent for participation, phone contact and the use of their corresponding birth data for analysis.

Findings

A total of 1087 participants were included during pregnancy, of which 880 women had a vaginal birth in our institution. The caesarean section rate in our population was 13.8 %. Fifteen participants were lost to follow-up at the time of the phone interview, and 13 participants were not available for the interview, leaving 852 women for analysis seven to ten days postpartum. Three months postpartum, 150 participants did not respond to the questionnaire, leaving 715 (81.3 %) for analysis. The flowchart in Fig. 1 shows exclusions, dropouts, and follow-up numbers.

The characteristics and birth outcomes for the study population (n = 880) is presented in Table 1. This table also shows the characteristics and birth outcomes of the total population giving birth vaginally during the study period (n = 6136).

A comparison of the characteristics and birth outcomes of responders and non-responders at three months postpartum showed that responders more often had European origin than non-responders (92 % versus 85.5 %). In addition, women responding to the three-month postpartum

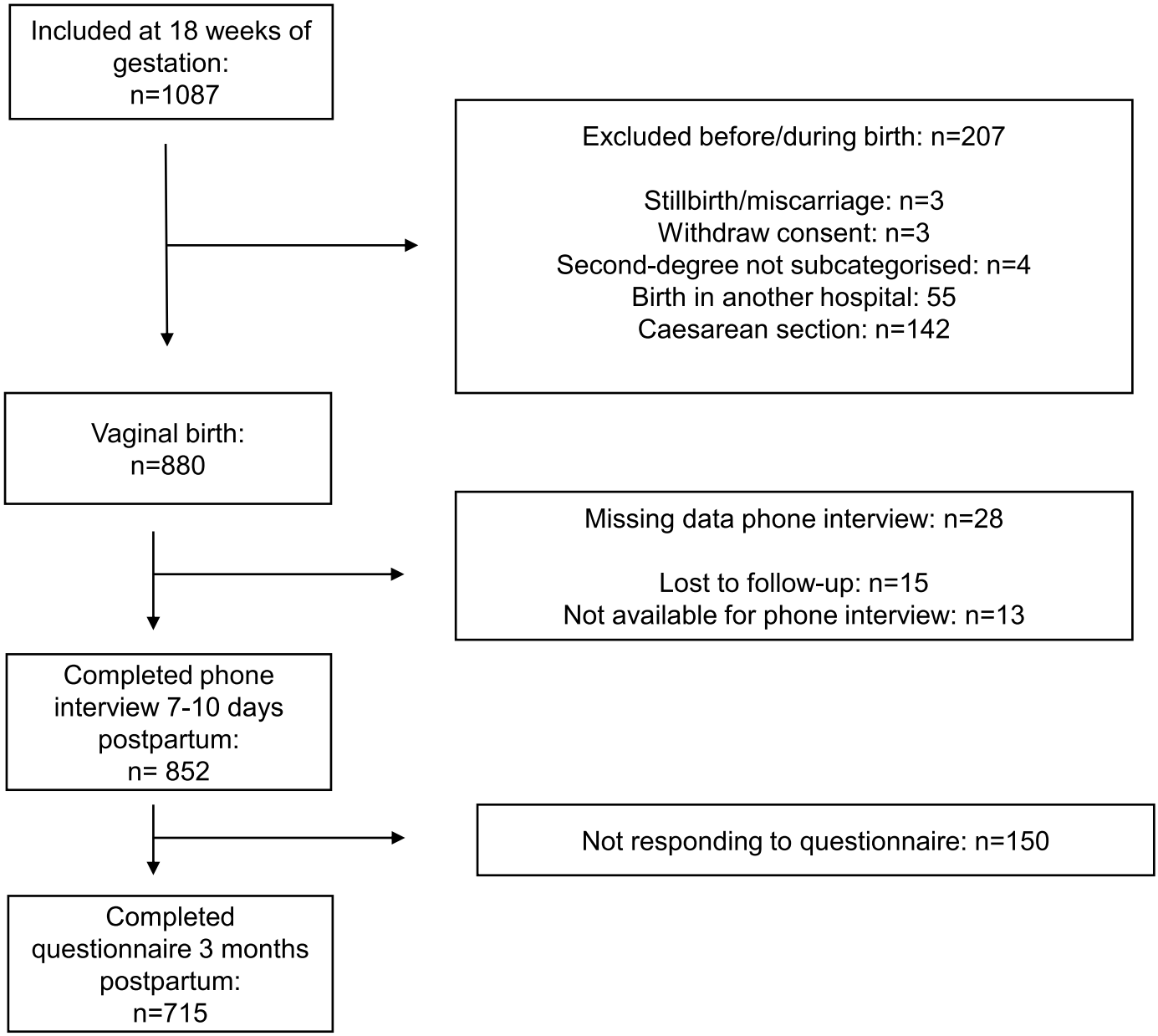


Fig. 1. Flowchart of the study population.

Table 1
Characteristics and birth outcome of the study population ($n = 880$) and the total population ($n = 6136$) giving birth at the institution during the study period.

	Study population $n = 880$			Total population giving birth at the institution within the study period $n = 6136$[a]			
	N	*Range*	*Mean ±SD*	*N*	*Range*	*Mean ±SD*	*P-value*
Age (years)	880	18–47	31.1 ± 4.0	6136	17–51	31.6 ± 4.5	0.002
Body Mass Index (kg/m^2)	879	13.5–49.0	24.7 ± 4.8	6116	13.4–71.1	24.7 ± 4.9	1.000
Gestational age (days)	880	235–298	280.8 ± 9.7	6136[a]	225–302	278.9 ± 10.1	<0.001
Birthweight (grams)	879	1600–5330	3588 ± 508	6135	1505–5450	3535 ± 500	0.033
Length of second stage labor (Minutes)[b]	874	1–437	74.8 ± 79.3	Information not available			
	N	*%*		*N*	*%*		
Married/Cohabitant	865	98.3		Information not available			
University / College degree	709	80.6		3829	62.4		<0.001
European origin	806	91.6		Information not available			
Primipara	457	51.9		2587	42.2		<0.001
Operative vaginal delivery	106	12.0		871	14.2		0.043
Induction of labor	246	28.0		Information not available			
Epidural/spinal anesthesia	426	48.4		Information not available			
Pudendal nerve block during labor	63	7.2		Information not available			
Episiotomy[c]	169	19.2		1100	17.9		0.179
Perineal tears							
No tear	132	15.0		1714	27.9		<0.001
First-degree tear	320	36.4		2564	41.8		<0.001
Second-degree tear	253	28.7		1766	28.8		0.492
2A-tear	136	15.5					
2B-tear	70	8.0					
2C-tear	47	5.3					
Third- and fourth-degree tear	6	0.7		92	1.5		0.027
Tobacco use 3 months postpartum	37	5.2		Information not available			
Hormonal contraception 3 months postpartum	208	29.1		Information not available			

During the study period the caesarean section rate was 13.8 % for the study population and 17.0 % for the total population.
[a] For the population, all vaginal deliveries with gestational age >223 days (32 weeks) were included.
[b] Second stage of labor is defined as the time between full cervical dilation to birth of the baby.
[c] May include other perineal tears in the study population.

questionnaire had more often sustained a 2C-tear or an episiotomy compared to women who did not respond to it (2C-tear: 6.2 % (responders) versus 1.2 % (non-responders); episiotomy: 20.6 % (responders) versus 13.3 % (non-responders)).

The mean pain scores seven to ten days and three months postpartum according to the severity of perineal trauma are presented in Table 2. Seven to ten days postpartum, women with 2C-tears had statistically significantly higher pain scores compared to women with 2A-tears (mean difference 1.44; 95 % CI 0.77–2.12) and 2B-tears (mean difference 0.96; 95 % CI 0.22–1.71). The differences in mean pain scores between women with 2A and 2B-tears were not statistically significant (mean difference 0.48; 95 % CI −0.10–1.06). The same was true for the three-month postpartum analysis, where statistically significantly higher mean pain scores were found in participants with 2C-tears compared to participants with 2A-tears ($p = 0.024$) and 2B-tears ($p = 0.021$). The difference in the mean pain scores of participants with 2A and 2B-tears three months postpartum was not statistically significant (Table 2).

In the multiple linear regression analysis 2C-tears were associated with higher perineal pain scores seven to ten days postpartum (coefficient 1.33; 95 % CI 0.75–1.90) and three months postpartum (coefficient 0.73; 95 % CI 0.27–1.19) compared to 2A-tears after adjusting for confounding factors. The pain scores of participants with 2B-tears were not statistically different from participants with 2A-tears after adjustment (Table 3).

Women with more severe perineal tears reported more frequent use of pain medication seven to ten days postpartum (Fig. 2). In the second-degree subcategory, the use of pain medication was reported by 34.8 % of the women with 2C-tears, 25.7 % of the women with 2B-tears and 11.3 % of the women with 2A-tears ($p < 0.001$). The mean units of pain

Table 2
Perineal pain scores assessed by 11-point numeric rating scale (NRS-11) according to perineal tears seven to ten days and three months postpartum.

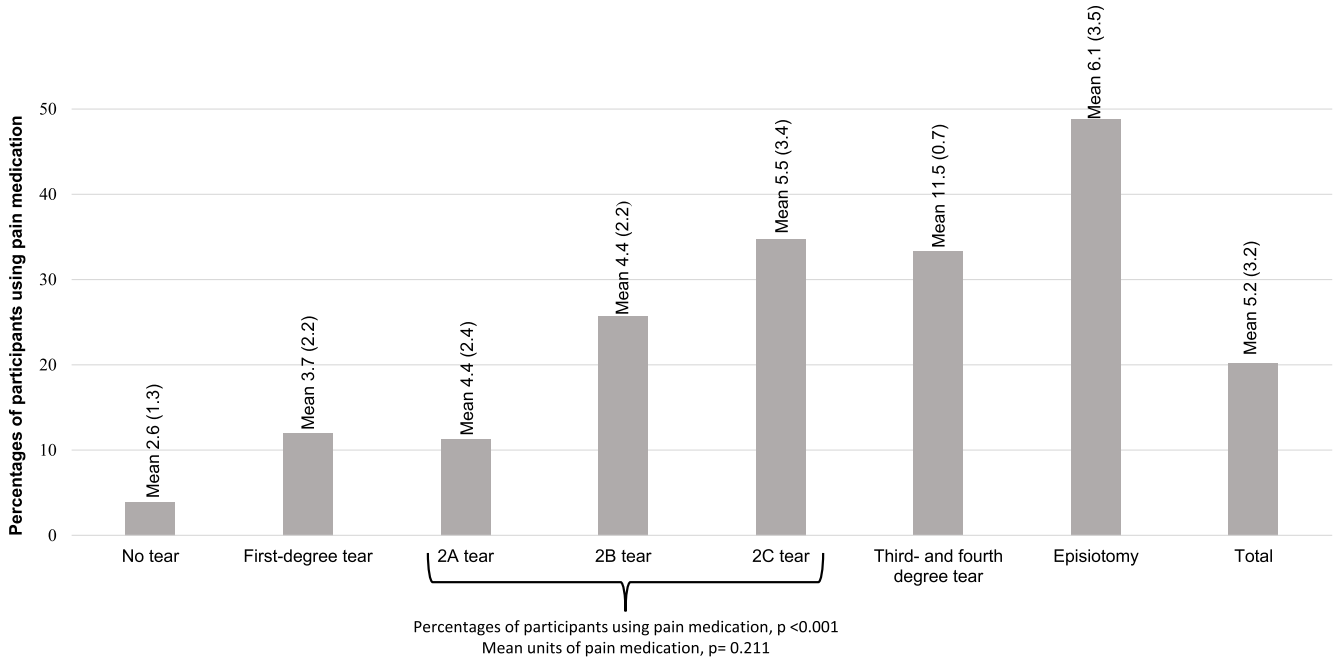
		7–10 days postpartum				3 months postpartum		
		N	Mean pain score (SD)	Mean difference (95 % CI) [a]	P-value [a]	N	Mean pain score (SD)	P-Value [b]
No tear		127	0.88 (1.27)			101	0.28 (0.85)	
First-degree tear		308	1.38 (1.38)			252	0.40 (1.01)	
2A-tear		133	1.99 (1.60)			112	0.45 (0.99)	
	2B			−0.48(1.06,−0.10)	0.130			0.710
	2C			−1.44(−2.12,−0.77)	<0.001			0.021
2B-tear		70	2.47 (1.63)			53	0.38 (0.93)	
	2A			0.48(−0.10,1.06)	0.130			0.710
	2C			−0.96(−1.71,−0.22)	0.007			0.024
2C-tear		46	3.43 (1.93)			44	1.16 (1.98)	
	2A			1.44(0.77,2.12)	<0.001			0.021
	2B			0.96(0.22,1.71)	0.007			0.024
Third- and fourth-degree tear		6	3.83 (1.17)			6	1.50 (2.07)	
Episiotomy		162	3.33 (1.79)			147	0.88 (1.51)	
Total		852	1.99 (1.78)			715	0.54 (1.22)	

[a] one-way Anova: Tukey Post-hoc test.
[b] Kruskal-Wallis test.

Table 3
Multiple linear regression results for perineal pain and second-degree subcategories seven to ten days and three months postpartum Unstandardized coefficient (B) and 95 % confidence interval for 2B- and 2C-tears compared to 2A-tears after adjustment[a] for confounding factors is shown.

	Seven to ten days postpartum				Three months postpartum			
Second-degree subcategories	N	Unstandardized Coefficient (B)	95 % confidence interval	P-value	N	Unstandardized Coefficient (B)	95 % confidence interval	P-value
2A-tear	133	Ref	Ref		112	Ref	Ref	
2B-tear	70	0.41	−0.07, 0.89	0.09	53	−0.07	−0.49, 0.35	0.748
2C-tear	46	1.33	0.75, 1.90	<0.001	44	0.73	0.27, 1.19	0.002

[a] Adjustment was made for age, body mass index, parity, ethnicity, operative vaginal delivery, length of second stage labor, fetal birthweight.



Total N=852: No tear (n=127), First-degree tear (n=308), 2A-tear (n=133), 2B-tear (n=70), 2C-tear (n=46), Third- and fourth-degree tear (n=6), Episiotomy (n=162).

One unit= 500 mg paracetamol, 200 mg ibuprofen, 250 mg naproxen, 25 mg diclofenac, 50mg tramadol hydrocloride, 400mg/30mg paracetamol/codeine

Fig. 2. Use of pain medication according to perineal tears seven to ten days postpartum Percentages of participants using pain medication and mean (standard deviation) units of pain medication used is shown.

medication used within the last 24 h increased with the severity of the second-degree tear; however, the result was not statistically significant ($p = 0.211$) (Fig. 2).

Seven to ten days postpartum the distribution of participants not breastfeeding was as follows: 4.5 % 2A-tears, 8.6 % 2B-tears and 4.3 % 2C-tears. Three months postpartum, the distribution of participants not breastfeeding was 8 % 2A-tears, 18.9 % 2B-tears and 15.9 % 2C-tears. There was no statistically significant difference in the percentage of participants not breastfeeding at either time point and participants who stopped breastfeeding between the two time points according to the severity of the second-degree tear (Fig. 3).

The percentage of reporting difficulties finding an optimal breastfeeding position increased with the severity of perineal tears. In our study sample, 25 % of the women reported difficulties in finding an optimal breastfeeding position due to perineal pain. The distribution of participants who reported such difficulties according to the degree of perineal tears was as follows: 4.1 % no tear, 16.8 % first-degree tears, 19.7 % 2A-tears, 31.3 % 2B-tears, 34.1 % 2C-tears, 80 % third- and fourth-degree tears and 54.7 % episiotomies. The study showed no statistically significant difference in reported difficulties finding an optimal breastfeeding position due to perineal pain, within the group of women having a second-degree perineal tear ($p = 0.079$).

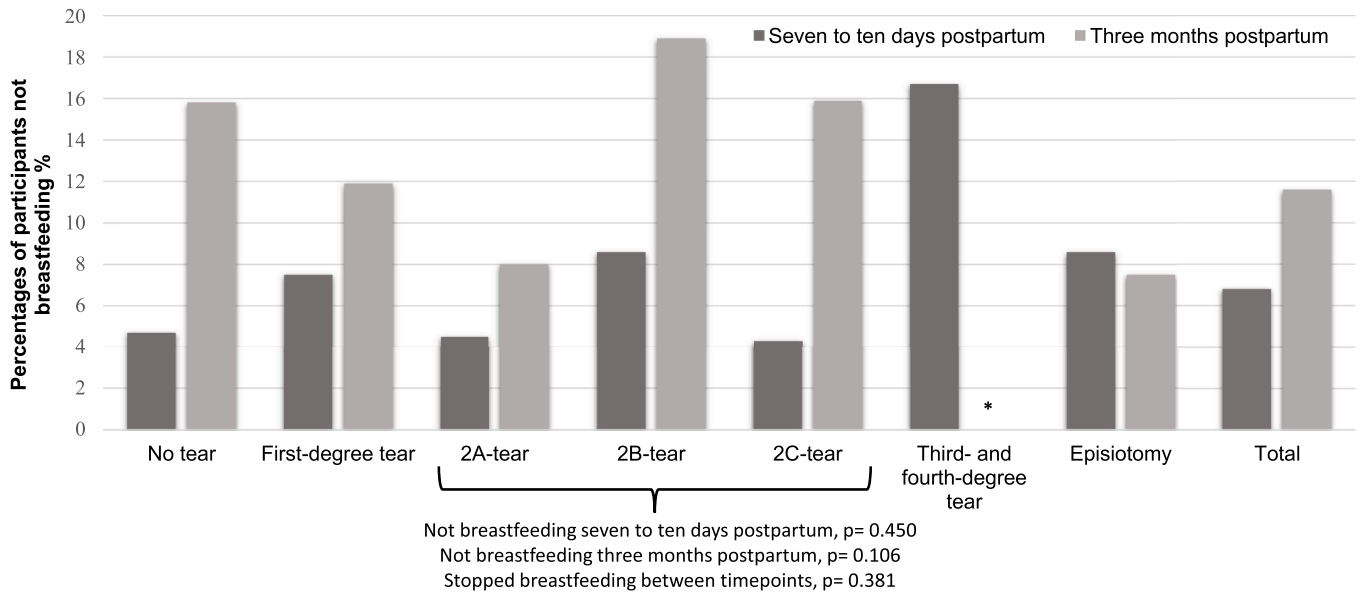
Discussion

Main findings

In this prospective cohort study, the primary aim was to assess differences in perineal pain according to the severity of perineal tears, with a focus on subcategories of second-degree tears, during the first three months postpartum. The secondary aim was to assess the use of pain medication and breastfeeding patterns according to the severity of the second-degree tears. We found that women with more severe second-degree tears reported statistically significantly higher pain scores compared to women with less severe tears during three months postpartum. Furthermore, participants with more severe second-degree tears reported more frequent use of pain medication, and in this group, the units of pain medication used increased with the severity of the tear. Breastfeeding frequencies did not differ statistically significantly between the second-degree subcategories; however, the percentage of participants having difficulties finding an optimal breastfeeding position increased with severity of the tear.

Comparison with existing literature

Previous studies on perineal pain have mainly concentrated on third-



Seven to ten days postpartum (n=852): No tear (n=127), First-degree tear (n=308), 2A-tear (n=133), 2B-tear (n=70), 2C-tear (n=46), Third- and fourth-degree tear (n=6), Episiotomy (n=162)

Three months postpartum (n=715): No tear (n=101), First-degree tear (n=252), 2A-tear (n=112), 2B-tear (n=53), 2C-tear (n=44), Third- and fourth-degree tear (n=6), Episiotomy (n=147)

*at three months postpartum the percentage of participants reporting not breastfeeding within third-and fourth degree tear category was 0%

Fig. 3. Participants not breastfeeding daily according to perineal tears seven to ten days and three months postpartum Percentages and frequencies (n) is shown.

and fourth-degree perineal tears (Andrews et al., 2008; Macarthur and Macarthur, 2004) and episiotomies (Manresa et al., 2019), and often did not focus solely on second-degree tears. In recent years, there has been an increased focus on consequences of second-degree perineal tears, and evidence indicates that second-degree tears are not as harmless as previously assumed (Åhlund et al., 2019; Huber et al., 2021). Attempts have been made to take into account the degree of tissue trauma within the second-degree category when assessing perineal pain during the first postpartum weeks (Åhlund et al., 2019; Manresa et al., 2020; Leeman et al., 2016). Existing studies show a number of methodological differences from our study, such as smaller sample sizes (Manresa et al., 2020) or the use of a retrospective design (Åhlund et al., 2019). Still, in line with our results, higher perineal pain scores have been found in participants with more severe second-degree tears (Åhlund et al., 2019; Manresa et al., 2020).

The experience of perineal pain may be confounded by characteristics and birth outcomes (Komatsu et al., 2020; Rosen and Pukall, 2016). In our study, regression analysis revealed that 2C-tears were independently associated with higher perineal pain scores compared to 2A-tears after adjustment. We have not controlled for the use of pain medication, suturing material used and wound infection/ breakdown. In this study, women with more severe second-degree tears used more pain medication. The suture technique was not standardised, and the perineal reconstruction of more severe second-degree tears might have been more challenging. Previous literature has shown that these factors can contribute to the experience of perineal pain (Macarthur and Macarthur, 2004; Kettle et al., 2012).

In line with previous literature, we found that pain scores declined up to three months postpartum, and were rather low in all perineal tear categories (Åhlund et al., 2019; Macarthur and Macarthur, 2004; Laine et al., 2020). Nevertheless, women with 2C-tears reported statistically significantly higher pain scores compared to women with less severe second-degree tears three months postpartum. Healthcare providers should be aware of the findings of our study, which should affect the postpartum care of women with more severe second-degree tears.

Seven to ten days postpartum 35 % of the participants with 2C-tears used pain medication compared to only 11 % of the participants with 2A-tears. Only a few studies have assessed the use of pain medication after hospital discharge. MacArthur et al. described a higher percentage of participants using pharmaceutical pain management according to the severity of perineal trauma seven days postpartum; however, estimates for pain medication were not shown (Macarthur and Macarthur, 2004). In our study, women with more severe second-degree tears used more units compared to women with less severe second-degree tears, although this effect was not statistically significant. This finding possibly indicates increased pain levels among women with more severe tears.

We chose breastfeeding as a measurement to evaluate the impact of perineal tears on women's daily lives. Breastfeeding has well known benefits to both mother and child (World Health Organization, 2023). In our study, no differences between the degree of tear and the percentages of participants not breastfeeding or participants who stopped breastfeeding during the first three months postpartum was found. However, our results showed that the percentage of women who found it difficult to find an optimal breastfeeding position due to perineal pain increased with the severity of the perineal tear. The Presidential Task Force on Redefining the Postpartum Visit recently recommended that postpartum care should last up to three months after birth (American 2018). Our findings suggests that perineal pain assessment and breastfeeding difficulties should be addressed in this follow-up. This may be especially important for women with more severe second-degree tears.

In this study we focused on perineal pain according to the second-degree subcategories. For a comprehensive understanding of our results, we present our outcome measures also for women with no/first degree-tears and women with episiotomies. As expected, participants with second-degree tears reported more pain than participants without tears or those with first-degree tears. Interestingly, participants with 2C-tears reported only slightly lower pain scores compared to participants with third- and fourth-degree tears and slightly higher pain scores than

participants who had undergone episiotomy. In our maternity ward, women with episiotomies or third- and fourth-degree tears are offered pain medication on a regular schedule, whereas women with second-degree tears often receive pain medication on demand. This approach may influnce usage patterns, as it has been shown, that women with acute perineal pain are more likely to use pain medication when they are offered by staff, than on demand (Swain and Dahlen, 2013). Therefore, it remains speculative how our findings are influenced by pain management processes in our maternity ward.

Methodological considerations

In this study we chose to assess perineal pain at seven to ten days postpartum, as previous research has shown that perineal pain occurs during the first days postpartum regardless of perineal tears (Manresa et al., 2019) and can be explained by the inflammation phase of normal wound healing (Pain, 2017). Furthermore, in a recent recommendation from the American College of Obstetricians and Gynecologists for optimising postpartum care, an individualised and women-centred follow-up during the first 12 postpartum weeks rather than an arbitrary 6-week check should be performed (American 2018). Therefore, we found the assessment of perineal pain three months after birth important. There are different measurement scales for pain assessment, each with different psychometric properties (Hartrick et al., 2003). The NRS-11 is widely used and is considered to be a superior pain intensity measure compared to other rating scales (Jensen et al., 2017). In a recent study comparing different pain scales, the authors concluded that the NRS-11 scale has been proven to be more sensitive and stabile (Euasobhon et al., 2022).

Strenght and limitations

Although there are several studies examining perineal pain in the postpartum period, the current study is among the few, where a subcategorization of second-degree tears is used. The inclusion of participants during pregnancy and the prospective design are major strengths of our study, as these elements reduced selection bias compared to studies that included participants only after birth. Furthermore, we were able to compare the study sample to the total population giving birth at the hospital during the study period. The episiotomy rate in our study (19.2 %) was slightly higher compared to the total population (17.9 %) and national numbers. According to the 'Medical Birth Registry of Norway', the episiotomy rate in 2022 was 16.5 % (Medical 2023). In addition, the numbers of third- and fourth-degree tears in our total population are comparable to the national numbers (Medical 2023).

In our study, 19 % of the participants did not respond to the three-month postpartum questionnaire, and participants with less severe perineal tears tended to respond less often than participants with more severe tears. Therefore, women with perineal pain might be over-represented, as women with complaints might respond more often than women without. However, although there might be an over-representation of women with perineal pain, the findings are still clinically relevant. Perineal pain can have consequences for the new mother as her mobility may be challenged, making it more difficult to find a comfortable breastfeeding position.

A limitation of this study is the lack of validation of the detailed classification system on second-degree tears. Preferably, a validation should have been performed before conducting the study. However, the detailed classification system showed good to very good interrater reliability among midwives at our delivery ward (kappa = 0.75; 95 % CI 0.67–0.83) (Macedo et al., 2022). The inclusion criterion of being able to understand a Scandinavian language resulted in an overrepresentation of highly educated primiparous participants in our study. Furthermore, we do not have information about the participants' mental health, and we are aware that there is an association between postpartum pain and postpartum depressive symptoms (Chang et al., 2016). We did not assess perineal pain prior to delivery, whereas perineal pain and depressive symptoms prior to birth, might influence perineal pain experience postpartum. However, it is unlikely that these factors impacted the women's risk for perineal tears. Therefore, we assume that they are distributed similarly within the perineal tear subgroups, which may affect the pain score in the tear groups but not differences in pain scores.

Despite the large sample size, the number of participants in the second-degree subcategory is limited, and may have resulted in a lack of statistical power. Furhermore, the data on breastfeeeding could have been assessed more extensively. We lack information on formula feeding and, therefore, cannot conclude that the participants who have been classified as breastfeeding were exclusively breastfeeding. However, we assume that the number of participants not breastfeeding in our study is comparable to national numbers (Halvorsen et al., 2015).

Conclusion

The subcategorisation used in this study revealed that there are differences in postpartum pain levels depending on the severity of second-degree tears. Participants with 2C-tears reported higher perineal pain scores and more frequent use of pain medication compared to participants with less severe tears during the first three months postpartum. There were no differences between the degree of perineal tears and the number of participants not breastfeeding. However, the percentage of participants reporting difficulties finding an optimal breastfeeding position increased with the severity of the tear.

National and intenational recommendations often highlight the importance of adequate pain controll as an important part of managing third-and fourth degree-tears but do not mention less severe perineal tears (Laine et al., 2020; American 2016). Our study shows that women with 2C-tears may have the need for comparable attention and pain management. Women should be informed that perineal pain is common within the first days postpartum but will decrease within the next weeks in all perineal tear groups.

Author agreements

This study is original work, and the article has not received prior publication and is not under consideration for publication elsewhere. An abstract of this study was presented as oral presentation at 33rd ICM Triennial Congress, International Confederation of Midwives in June 2023.

This study is submitted by the copyright terms and conditions of Elsevier. STROBE checklist for cohort studies is used.

CRediT authorship contribution statement

Jeanette Risløkken: Data curation, Formal analysis, Writing – review & editing. **Marthe Dalevoll Macedo:** Data curation, Writing – review & editing. **Kari Bø:** Writing – review & editing. **Marie Ellström Engh:** Writing – review & editing. **Franziska Siafarikas:** Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.midw.2024.103930.

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