

CLINICAL ARTICLE

Obstetrics

Fear of childbirth and use of labor analgesia: A nationwide register-based analysis in Finland

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Abstract

Objective: To calculate the rates of labor analgesia among women with fear of childbirth (FOC) in multiparous and nulliparous women, because FOC might be associated with higher rates of labor analgesia.

Methods: In this retrospective register-based cohort study, data from the National Medical Birth Register was used to evaluate the usage of labor analgesia in pregnancies with FOC, when compared with those without. The analgesia methods were stratified into neuraxial analgesia, pudendal, paracervical, nitrous oxide, other medical, other non-medical, and no analgesia.

Results: A total of 19 285 pregnancies with diagnosed maternal FOC were found during our study period. The control group consisted of 757 997 pregnancies without diagnosed maternal FOC. Nulliparous women with diagnosed FOC had a higher rate of epidural analgesia (70.2% vs 67.1%), spinal analgesia (12.3% vs 7.6%), and pudendal block (17.6% vs 9.6%). Multiparous women with FOC had a notably higher rate for epidural analgesia (47.0% vs 29.0%).

Conclusion: The main finding in this study was that women with diagnosed FOC had a higher rate of labor analgesia. The results of this study can be used by midwives, obstetricians, and anesthesiologists to provide optimal pain relief for mothers with FOC.

KEYWORDS

epidemiology, fear of childbirth, labor analgesia, obstetrics

1 | INTRODUCTION

Fear of childbirth (FOC) is a common obstetrical challenge affecting women's health.¹ In Finland, the reported prevalence of FOC has increased from 1.1% in 1997 to 9.1% in 2018.^{2,3} However, in other Nordic countries, the prevalence of FOC has been observed to be much higher, rising to 10%–20%.^{4,5} Advanced maternal age, depression, and high socioeconomic status have been reported to be predictive factors for FOC. Other predictive factors for FOC include previous operative deliveries such as vacuum or emergency cesarean delivery.^{6,7}

During the last few years, FOC has raised the concerns of experts in this field, as in addition to rapidly increasing incidence, the negative effects of FOC on the health of the mother and fetus have been found to be wider than thought.⁸ In addition, a new study found that women with FOC have notably lower subsequent birth rates.⁹ Hence, the psychological mechanisms of FOC are reported to require further investigation with high priority.^{10–12} FOC may overshadow the whole pregnancy, leading to postpartum depression and posttraumatic stress disorder.^{13,14} Studies assessing the use of labor analgesia among women with FOC are lacking, and no previous

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studies have reported the rates of different labor analgesia among these women. A new study in 2021 found that FOC is a potential predictor of higher labor pain intensity.¹⁵ In addition, the study concluded that analgesic consumption was not proven to be associated with FOC.¹⁵ A study in 2018 found that women with severe FOC experienced more labor pain than women without FOC, but adjusting the symptoms by maternal depression, anxiety, and use of epidural/spinal anesthetic or nitrous oxide gas, there was no evidence of a difference.¹⁶

Based on our hypothesis, due to the increased intensity of pain during labor, and higher desire for pain relief by the mother, FOC might be associated with higher rates of labor analgesia. This study aims to calculate the rates of labor analgesia among women with FOC in multiparous and nulliparous women, when compared with those without FOC diagnosis.

2 | MATERIALS AND METHODS

In this nationwide retrospective register-based cohort study, data from the National Medical Birth Register (MBR) was used to evaluate the use of labor analgesia in pregnancies with FOC, when compared with the pregnancies without. The MBR contains information on pregnancies, delivery statistics, and the perinatal outcomes of all

births with a birth weight of 500g or more or a gestational age of 22⁺0 weeks or longer, and it is maintained by the Finnish Institute for Health and Welfare. The MBR has high coverage and quality (the current coverage is nearly 100%).¹⁷ The study covered the period from January 1, 2004, to December 31, 2018.

In the MBR, FOC is defined according to the International Classification of Diseases 10th revision code O99.80, established in 1997. All women are asked about any fears they may have about childbirth during visits to the woman and child welfare clinics in primary care in Finland, indicating that FOC is screened for in these visits. Women who experience FOC during the visits to woman and child welfare clinics and/or have requested cesarean section (CS) due to FOC are referred to an outpatient clinic of a secondary/tertiary maternity hospital where FOC is diagnosed and dealt with by a physician or specialized midwife. The diagnosis codes are then gathered to the MBR. For labor analgesia analysis, elective CS ($n=52876$), out-of-hospital deliveries ($n=2301$), and non-singleton deliveries ($n=12132$) were excluded from the analysis. Nulliparous and multiparous women were also analyzed separately. A total of 777282 pregnancies were included in this study. The study groups are shown as a flowchart in Figure 1.

Our main outcome in this study was the use of labor analgesia. The analgesia methods were stratified into neuraxial analgesia (epidural, spinal, and combined), pudendal, paracervical, nitrous

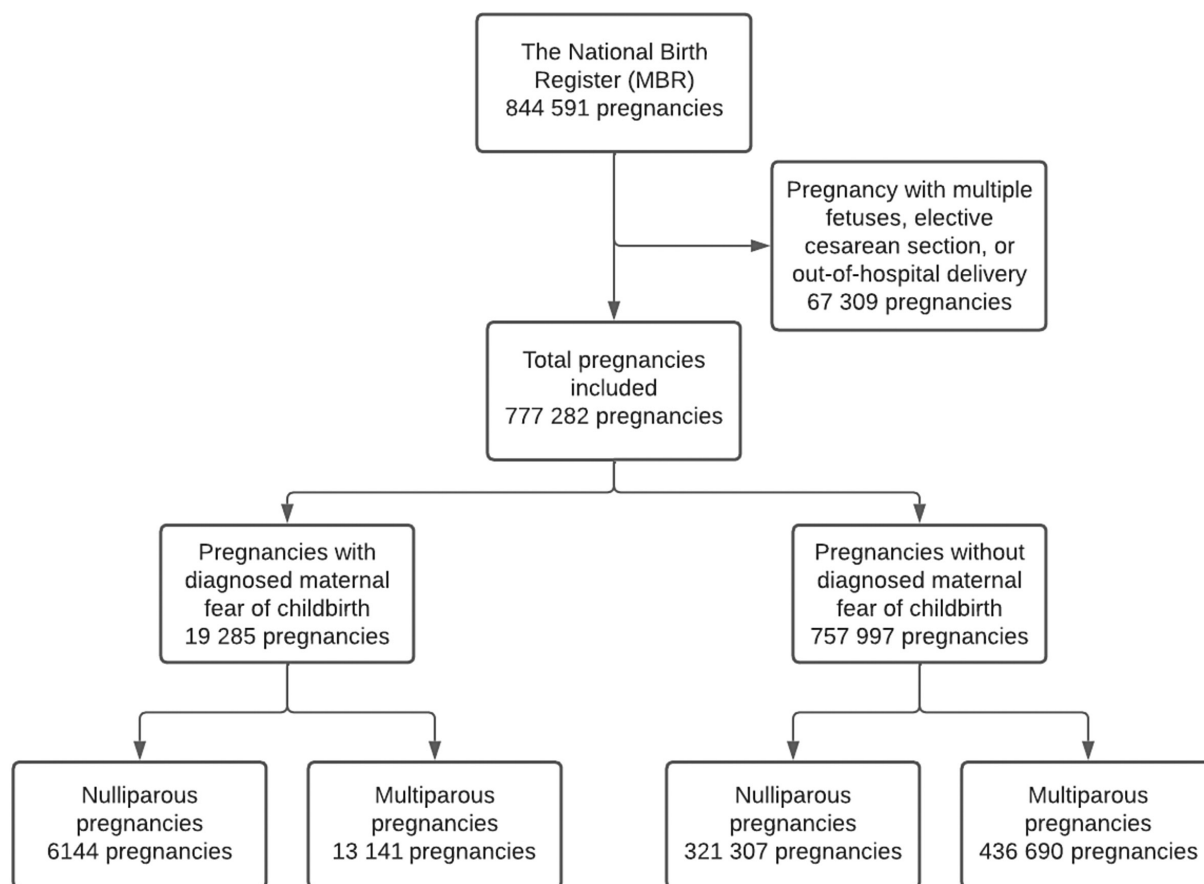


FIGURE 1 Flowchart of the study groups. Pregnancies with diagnosed maternal fear of childbirth were compared with those without it.

oxide, other medical (includes opiates), other non-medical (such as bath, aqua bubbles, and transcutaneous electrical nerve stimulation), and no analgesia. These are analyzed as categorized dichotomy (yes or no) variables, because the register does not contain more precise information, for example on the dosage used. The register only gathers information on intrapartum analgesia excluding analgesia used during CS or other surgical procedures. One patient may have had none or many of these during labor. Continuous variables were reported as mean with standard deviation or as median with interquartile range based on the distribution of the data. Categorized variables were presented as absolute numbers and percentages. An α of 0.05 is used as the cut-off for significance. The results of this study are reported according to the STROBE guidelines.¹⁸ Statistical analysis was performed using R version 4.0.3.

The Ethics Committee of Tampere University Hospital waives the ethics committee evaluation of all retrospective studies using routinely collected healthcare data; a decision based on the Law of medical research 488/1999 and the Law of patient rights 785/1992. The MBR uses a pseudonymized identification number for each patient. The pseudonymization was done by the Finnish data authority Findata and the authors did not have access to the pseudonymization key. In accordance with Finnish regulations (Law of secondary use of routinely collected healthcare data 552/2019), no informed written consent was required because of the retrospective register-based study design and as the patients were not contacted. Permission for these data was granted by Findata after the evaluation of the study protocol (permission number: THL/1756/14.02.00/2020).

3 | RESULTS

A total of 19 285 pregnancies with diagnosed maternal FOC were found during our study period. Of these, 6144 (31.9%) pregnancies were first pregnancies ending in delivery for the mother. The control group consisted of a total of 757 997 pregnancies without diagnosed maternal FOC. Of these, a total of 321 307 (42.4%) pregnancies were first pregnancies for the mother. Women with FOC had a higher rate for gestational diabetes (17.0% vs 12.5%), labor induction (34.1% vs 21.5%), and urgent CS (19.0% vs 10.0%). Background information on the study groups is shown in Table 1.

Among nulliparous women, women with diagnosed FOC had a higher rate of epidural analgesia (70.2% vs 67.1%), spinal analgesia (12.3% vs 7.6%), combined spinal-epidural analgesia (5.7% vs 2.3%), and pudendal block (17.6% vs 9.6%), when compared to the control group without diagnosed maternal FOC. Both groups had low rates of women without any registered labor analgesia (0.9% and 0.2%). Among multiparous women, women with FOC had a notably higher rate for epidural analgesia (47.0% vs 29.0%), a higher rate for spinal analgesia (25.2% vs 21.6%), pudendal block (13.5% vs 6.6%), and non-medical analgesia (32.7% vs 24.9%). Both groups had low rates of women without labor analgesia (0.8% and 0.5%) (Table 2).

4 | DISCUSSION

The main finding in this study was that women with diagnosed FOC had a higher rate of labor analgesia, especially neuraxial analgesia (epidural, spinal, combined spinal-epidural), and pudendal block. Most importantly, a notable increase in the use of epidural analgesia was observed, especially among multiparous women.

In multiparous women, the rate of epidural analgesia was nearly two times higher among women with diagnosed FOC than women without FOC. This is a new finding, as the previous study focusing on the use of epidural analgesia did not observe any evidence of a difference in the use of labor analgesia among women with FOC and those without FOC.¹⁵ This study did not analyze multiparous and nulliparous women separately. In previous studies, FOC has been associated with higher intensity of pain during labor,^{15,16} which might explain the increased rate of epidural analgesia. A previous painful or uncomfortable birth experience might increase the desire for pain relief in subsequent pregnancies, which might increase the rate of pain relief, especially in multiparous women. According to a recent nationwide study in Finland, the most common factors in first pregnancy associated with FOC in subsequent pregnancies were instrumental vaginal deliveries, in-labor CS, third- or fourth-degree tear of the perineum, and shoulder dystocia.⁷ All of these factors might increase the

TABLE 1 Background information on patients with diagnosed fear of childbirth and without diagnosed fear of childbirth who started labor in Finland from 2004 to 2018.^a

Information	Fear of childbirth	No fear of childbirth
Total number of patients	19 285	757 997
Age, years	30.7 ± 5.3	29.6 ± 5.3
Nulliparous	6144 (31.9)	321 307 (42.4)
Maternal smoking status		
Smoker	2850 (14.8)	111 006 (14.6)
Unknown	599 (3.1)	21 203 (2.8)
Maternal BMI (pre-pregnancy)	24.8 ± 5.1	24.4 ± 4.8
BMI missing	407 (2.1)	33 996 (4.5)
Diagnosed gestational diabetes	3278 (17.0)	94 486 (12.5)
Induction of labor	6584 (34.1)	163 195 (21.5)
Mode of delivery		
Assisted vaginal ^b	1922 (10.0)	74 706 (9.9)
Urgent CS	3657 (19.0)	75 961 (10.0)
Emergency CS	191 (0.1)	8573 (0.1)
Obstetric complications		
Tear of perineum	175 (0.9)	6936 (0.9)
Episiotomy	3504 (18.2)	168 824 (22.2)

Abbreviations: BMI, body mass index (calculated as weight in kilograms divided by the square of height in meters); CS, cesarean section.

^aData are presented as mean ± standard deviation or as number (percentage).

^bIncludes vaginal breech delivery, vacuum, or forceps delivery.

TABLE 2 Use of labor analgesia among patients with diagnosed fear of childbirth and those without in Finland from 2004 to 2018.

	Nulliparous pregnancies		Multiparous pregnancies	
	Fear of childbirth	No fear of childbirth	Fear of childbirth	No fear of childbirth
Total number of patients	6144	321 307	13 141	430 690
Labor analgesia ^a				
Epidural	4136 (70.2)	215 680 (67.1)	6171 (47.0)	124 782 (29.0)
Spinal	758 (12.3)	24 263 (7.6)	3316 (25.2)	92 867 (21.6)
Combined spinal-epidural	351 (5.7)	7445 (2.3)	508 (3.9)	5023 (1.2)
Paracervical block	543 (8.8)	38 420 (12.0)	1982 (15.1)	86 472 (20.1)
Pudendal block	1080 (17.6)	30 727 (9.6)	1774 (13.5)	28 240 (6.6)
Nitrous oxide	3505 (57.0)	199 385 (62.1)	6674 (50.8)	214 770 (49.9)
Other medical analgesia	1160 (18.9)	58 825 (18.3)	1293 (9.8)	37 821 (8.8)
Non-medical analgesia	2357 (38.4)	112 291 (34.9)	4293 (32.7)	107 404 (24.9)
No analgesia	56 (0.9)	690 (0.2)	111 (0.8)	1988 (0.5)

^aData are presented as number (percentage).

intensity of the pain and therefore increase the desire for pain relief in subsequent pregnancies. Confounding factors, such as higher body mass index among women with FOC might partly explain the higher rate.¹⁹ However, according to a recent study in Finland, women with gestational diabetes (which was much more prevalent among women with FOC) had no higher rate of labor analgesia.²⁰

Among women with FOC, higher rates of spinal analgesia and pudendal block compared with women without FOC may reflect the fear of pain, especially during the active second stage of labor. In addition, the notably higher rate of labor inductions most likely partly explains the increased rate of epidural analgesia.

As the prevalence of FOC is currently rapidly increasing,³ studies assessing this topic are warranted. In addition, as the range of symptoms caused by FOC was recently found to be higher than thought, including lower birth rate and psychological challenges,^{9,10} the studies should focus on the optimal treatment of patients with FOC, and prevent the development of FOC for women without a diagnosis FOC. The results of this study should be acknowledged by the clinicians and anesthesiologists to improve satisfaction levels and to provide optimal treatment for mothers with FOC.

The main strength of the present study is the nationwide register coverage including practically all deliveries in Finland and the high validity and precision of the register.¹⁷ The main limitation is the lack of data on attempted analgesia methods, as only successful analgesia methods are reported to the register. Another limitation is that the register does not have information on analgesic doses and therefore possible differences between the two groups remain unknown. Furthermore, the register only gathers information on intrapartum analgesia; hence, we have not analyzed postpartum analgesia. In addition, the severity of FOC, and gestational age for FOC assessment is unknown. Furthermore, we do not have information on postpartum fear, women's birth experience, or if they were satisfied with the pain relief during labor. As there are no uniform criteria or definitions for FOC, the forms, severity, and symptoms can vary between

individuals. Indeed, FOC takes different forms in different women and may manifest as physical complaints, nightmares, and difficulties to concentrate.²¹ However, the most severe cases of FOC most likely have a diagnosis of FOC and are registered in the MBR. Also, as the size of the non-exposed group was large, the possible bias of undiagnosed FOC patients should not have a major impact on results. Possible unidentified cases of FOC in the non-exposed group would most likely lead to results that are biased towards the null.

The main finding of this study was that women with diagnosed FOC had a higher rate of labor analgesia. Most importantly, a notable increase in the use of epidural analgesia was observed, especially among multiparous women. The results of this study can be used by midwives, obstetricians, and anesthesiologists to prepare and provide optimal pain relief for mothers with FOC.

AUTHOR CONTRIBUTIONS

MV wrote the initial manuscript. IK, VMM, and MV undertook the study design. MK provided clinical expertise. Each author commented on the manuscript during the process and confirmed the final version to be submitted.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

Research data are not shared.

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