Factors Influencing the Rejection of Neuraxial Analgesia for Childbirth by Pregnant Women: A Cross-Sectional Study at a Single Medical Cente

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ABSTRACT

Background: One of the main reasons women prefer cesarean surgery is their fear of pain during natural process of childbirth. Neuraxial analgesia is a beneficial option for decreasing pain during natural childbirth. However, painless childbirth is still not widely accepted by parturient in developing countries compared to high-resource countries due to cultural issues and lack of knowledge. We investigated the causes of rejecting neuraxial painless childbirth in parturient admitted to the labor ward of our hospital.

Methods: A total of 567 parturient who declined neuraxial analgesia for painless labor were included in this single center cross-sectional study conducted between 2020 and 2022. The causes of refusal and level of knowledge were evaluated using a validated and reliable questionnaire.

Results: The main reasons for patients' refusal of neuraxial analgesia were fear of neuraxial complications, concern about insertion of the spinal needle, and worry about prolonging labor time following neuraxial analgesia, respectively. 51 participants had high, 134 had medium and 381 had low awareness level. Parturient who attended prenatal classes as well as those who used internet as a source of information had significantly higher levels of awareness.

Conclusion: Fear of neuraxial complications, spinal needle and delaying childbirth were the primary reasons for maternal rejection. The women's knowledge about neuraxial painless labor was inadequate

Introduction

The wellbeing of parturient is a global priority for health systems worldwide. In this context, the promotion of natural childbirth is a serious consideration for health officials and policymakers. Natural childbirth is as fewer complications and is more affordable compared to cesarean delivery [1-2]. Cesarean section (CS) can increase the risk of thromboembolic events, wound infections, bleeding, increased need for nursing care, prolonged hospital stays, and anesthesia-related adverse events. Difficult intubation and aspiration pneumonia are among the most serious and potentially fatal complications of anesthesia due to airway edema and changes in the digestive system following pregnancy.

Labor pain is one of the most severe pains experienced by humans; fear of pain during natural childbirth along with inadequate information about complications of CS makes women prefer CS to natural childbirth. These factors may have influenced the inappropriate increase in the rate of cesarean section in Iran in the recent years [3].

Providing safe and effective labor analgesia may encourage women to choose natural childbirth and reduce the rate of CS [4-5]. The history of labor analgesia dates back to 1865 with the use of chloroform [6], and the first study on caudal analgesia during labor was published over 110 years ago in 1910 [7]. Neuraxial analgesia (NA) has proven to be the gold standard method to relieve labor pain [8-10]. Also, NA for labor pain does not significantly impact CS rates, Apgar scores of newborns, or lactation outcomes [11-13]. It may even reduce maternal stress, thereby potentially decreases postpartum depression [14]. Today, with the use of lower concentrations of local anesthetics in combination with short-acting opioids, the tone of the abdominal and perineal muscles is preserved and the duration of labor is not affected by neuraxial analgesia [15-17]. On the other hand, administration of systemic analgesics for labor pain may be associated with fetal complications and the need for emergency CS compared to NA [15].

In Iran, the Ministry of Health and Medical Education published the first guideline in 2015 to promote painless childbirth (PC). However, the demand for PC remains low in our country similar to other developing countries which may be due to economic, social, and cultural barriers. On the contrary, developed countries have a remarkable request rate of around 70% [18]. To our knowledge the causes of rejecting neuraxial analgesia for natural delivery are not well known and have not been investigated in Iran.

To promote natural delivery, it is important to assess the reasons behind women's refusal of PC. Therefore, this study was conducted to investigate the factors affecting the rejection of NA for childbirth by women and also to evaluate their level of information about PC.

Methods

Study Design and Participants

This cross-sectional observational study was performed between September 2020 and December 2022 at Taleghani University Hospital. An anesthesia consultation was initially conducted by anesthesiology assistants for each parturient admitted to the labor ward for natural childbirth to get permission for doing painless labor by NA, during which the procedure was explained to them. All consecutive parturient with of any gravida and parity and any level of pain or cervical dilation who scheduled for natural delivery and refused NA for PC were included in the study. Women who were unable to be interviewed due to severe labor pain, those unwilling to participate in the study, and uncooperative mothers were excluded. Afghan women were not included due to economic reasons and the hospital's financial policies. Then, a face-to-face interview was conducted by anesthesiology assistants in the labor ward with those parturient who rejected NA to assess the causes of their rejection and also their information about NA for labor analgesia. In total, 567 eligible parturient were enrolled in the study. On the other hand, neuraxial painless childbirth was performed for those who accepted the procedure. The following formula was used to calculate the required sample size [19]. Based on our pilot study, with an expected 20% prevalence of a high refusal rate, a 95% confidence interval, a 4% margin of error, and a 10% non-response rate, the minimum required sample size was 450.

Data Collection Tool

The evaluation tool was a three-parts questionnaire consisting of data related to maternal demographic, awareness level, and causes of NA refusal. The questionnaire was designed based on the previous studies [20-21], consultation with the experts, and information extracted from the questions asked by pregnant women in perinatal classes.

The awareness section had seven and refusal part had 9 questions. Answers to each question were recorded as "yes" or "no". In the awareness section, individuals who answered yes to 0-2 questions were considered as low, those who answered yes to 3-5 questions as medium, and those who answered yes to 5-7 questions as high knowledge. The content validity of the questionnaire was quantitatively assessed using the Content Validity Index (CVI) and Content Validity Ratio (CVR) based on the opinions of 11 experts including anesthesiologists, obstetricians, and epidemiologists. CVR was used to confirm the selection of the most important and accurate questions, while CVI was used to confirm the content measurement of the researcher-made questionnaire items (acceptable $CVI > 0.78$ and $CVR > 0.7$) [22]. Cronbach's alpha was used to check the reliability of the questionnaire, yielding a value of 0.79. Face validity was established using qualitative methods.

Ethical Considerations

This study received approval from the ethical committee of Shahid Beheshti University of Medical Sciences (ethical code IR.sbmu.msp.rec.1399.403). The study protocol was clearly outlined to the participants and written informed consent was obtained from each individual before the study.

Data Analysis

Analyses were conducted using mean and standard deviation. Spearman's correlation was used to study the association between awareness score and age, gravidity. The Mann-Whitney U test was employed to examine the measured variables between two groups of people who passed the prenatal training or not, while Kruskal-Wallis test was used for comparisons involving more than two groups of parturient with different education levels and different information sources. Statistical significance was

set at P value ≤ 0.05. All analyses were performed using R, version 4.2.1.

Results

Out of 1265 parturient admitted to the labor ward of our hospital (Figure 1), 567 who refused NA for labor pain were included in the study. Their mean age was 27.2±6 years (ranging from 16 to 43 years), and the mean gravidity was 1.91±0.94 (ranging from 1 to 5).
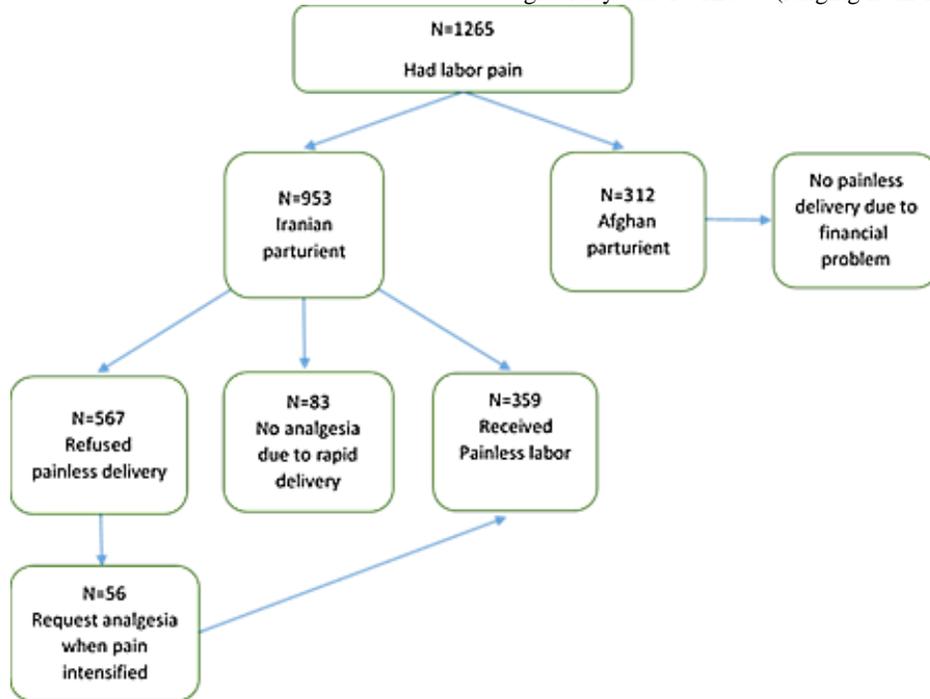
Figure 1- Data flowchart

The reasons for parturient refusal are depicted in (Figure 2). The main reasons were fear of spinal complications (95%), concern about the needle insertion (48%), and worries about the impact of painless labor on prolonging the childbirth process (46%), respectively. Additionally, 31% of participants believed that childbirth is a natural process and were not interested in using analgesia, and 23% were also eager to experience pain of childbirth. Furthermore, 56 (10%) of the participants who initially refused painless labor asked for analgesia later due to worsening of the pain (Figure 1).
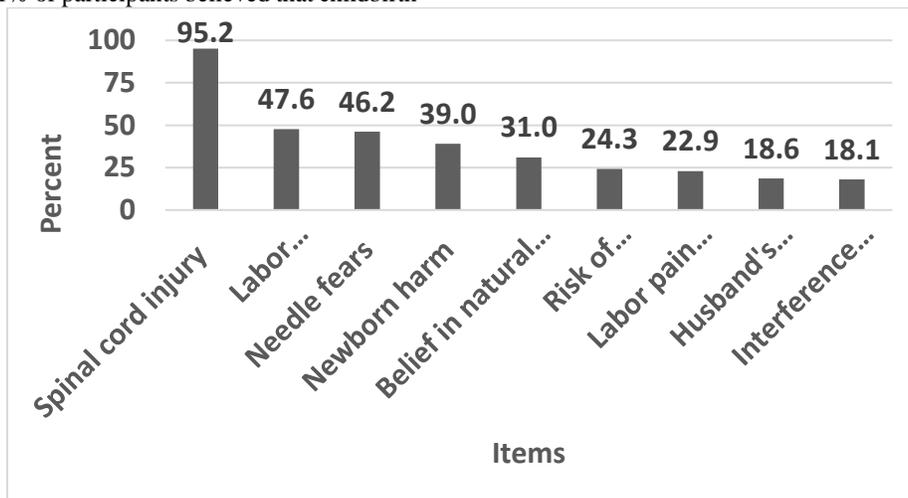
Figure 2- The causes of rejection of painless childbirth by parturient. Data are presented as percentage.

51 parturient (9%) had high, 134 (23.8%) had medium and 381 (67%) had low awareness level about PC. The mean number of "yes" answers to seven questions that evaluated the knowledge (awareness) level of the participants was 1.79±2.27. Awareness was significantly higher in women who participated in prenatal classes and also in those who obtained information from the internet (P<0.001). The degree of education did not affect the awareness level of patients about PC (Table 1).

Table 1- The association between education, information source and prenatal training with the awareness level.

Variables	No. of Parturient	Awareness level	P value
Education level			
High school	321(56.7)	0.66 ± 1.59	
Diploma	164(29)	2.77 ± 1.91	0.83[1]
University	81(14)	4.27 ± 2.38	
Information source			
Medical staff	324(57.1)	1.76 ± 2.06	
TV	70(12.4)	0.69 ± 1.78	<0.001*[1]
Internet	105(18.56)	2.46 ± 2.38	
Relatives &others	67(11.9)	2 ± 2.08	
Prenatal training			
Yes	119(21)	3.5 ± 2.71	
No	448(79)	1.33 ± 1.9	<0.001*2

1: Kruskal-Wallis, 2: Mann-Whitney U test, * Significant level 0.05. Data are expressed as mean ± SD and number (percentage).

Spearman's correlation showed significant positive association between awareness and age (r=0.195, P=0.005). No significant statistical correlation was observed between gravidity and awareness level (r=-0.134, P=0.052). The answers of parturient to the awareness section of the questionnaire are presented in (Table 2).

Table 2- The answers of parturient to the awareness part of the questionnaire.

	Questions	Parturient answer	% of parturient
1	Do you know that childbirth can be painless?	Yes No	37.1 62.9
2	Do you know that painless childbirth is your right?	Yes No	39 61
3	Do you know that the possibility of painless childbirth has been provided in many hospitals?	Yes No	19.5 81.5
4	Do you know that you can have a painless delivery with various methods?	Yes No	27.1 72.9
5	Do you know that painless childbirth methods are safe?	Yes No	22.9 77.1
6	Do you know that it has been more than 100 years that painless childbirth has been done in the world?	Yes No	18.1 81.9
7	Do you know that painless childbirth is free?	Yes No	14.1 87.9

Discussion

In the present study, we investigated the causes of rejection of neuraxial painless labor in the parturient scheduled for natural delivery in the labor ward of our hospital. Their level of knowledge about this issue was also examined. Fear of spinal complications, particularly back pain, apprehension about needle insertion into the spinal cord, and concerns about delaying childbirth were the main causes of maternal refusal. Several parturient also expressed worries about potential adverse effects of painless labor on newborn health, breastfeeding ability, and an increased likelihood of CS. 31% believed that childbirth is a natural process that does not require analgesia, and 23% expressed willingness to experience labor pain. Furthermore, the husband's opposition to NA painless childbirth was the reason for not accepting this method in 18% of our participants (Figure 2).

Similar to our findings, the results of prior studies of India showed poor knowledge and acceptance of labor analgesia. In those studies, in more than 80% of parturient of any parity, the primary causes of reluctance to labor analgesia were the desire to experience natural childbirth, worrying about harm of painless childbirth to baby, and the opposing views of families on this technique [20-21]. Likewise, a systematic review from England evaluated women's experiences with childbirth pain across several countries, including Iran, indicating women's satisfaction with labor pain [23].

Moreover, most of our participants had insufficient information about PC (Table 2). We also found that awareness was significantly higher in those who participated in prenatal classes and individuals used the internet as an information source. Notably, healthcare providers including obstetricians, midwifery personnel,

and anesthesia residents did not positively influence participants' awareness.

Previous studies showed insufficient information of midwives about PC. They found that addressing parturient concerns about PC and providing education for midwives may be helpful in increasing acceptance rate of neuraxial methods for PC [24-25].

There are conflicting opinions about the effect of awareness on the acceptance or rejection rate of NA painless childbirth. Accordingly, a study by Shaaban et al. [4]in Egypt showed that 85% of parturient were unaware of the possibility of performing painless labor and most of them initially requested a CS due to fear of childbirth pain. However, when they informed about analgesia options, half of them opted out of a CS. In another study, researchers found very little knowledge about labor analgesia among participants attending antenatal clinics, but when given the information, the majority were willing to use PC [5]. In contrast, Sharma et al. [26] and Hosseinzadeh et al. [27] found a high acceptance rate in parturient despite low information about painless childbirth.

In order to investigate the relationship between the level of awareness and non-acceptance of NA painless labor, more extensive studies with more participants are needed. Moreover, further comprehensive studies are needed to compare the impact of factors such as awareness levels, prenatal training, education degree, gravidity and parity between parturient who refuse NA for PC and the group that accept it.

The limitation of our study was its single-center design. In order to get more information about the causes of rejection in a large number of patients, it is recommended to conduct multi-center studies on this issue in large and small cities with different cultures to find appropriate solutions to encourage NA painless childbirth.

Conclusion

The main reasons for maternal refusal of neuraxial analgesia for painless labor were parturient concerns about neuraxial complications, fear of needle insertion into the spinal cord, and worries about potential delays in the childbirth process, respectively. Our study revealed a low awareness level regarding neuraxial analgesia during childbirth. Using the internet and participating in prenatal classes had a significant impact on patients' awareness. It is recommended that the effect of awareness level on acceptance and non-acceptance of painless delivery with NA should be done during wider studies with more participants.

References

[1]   Berg J, Källén K, Andolf E, Hellström-Westas L, Ekéus C, Alvan J, et al. Economic Evaluation of Elective Cesarean Section on Maternal Request Compared with Planned Vaginal Birth-Application to Swedish Setting Using National Registry Data. Value Health. 2023;26(5):639-48.

[2]   Entringer AP, Pinto M, Gomes M. Cost-effectiveness analysis of natural birth and elective C-section in supplemental health. Rev Saude Publica. 2018; 52:91.

[3]   Pourshirazi M, Heidarzadeh M, Taheri M, Esmaily H, Babaey F, Talkhi N, et al. Cesarean delivery in Iran: a population-based analysis using the Robson classification system. BMC Pregn Childbirth. 2022;22(1):185.

[4]   Shaaban OM, Abbas AM, Mohamed RA, Hafiz H. Lack of pain relief during labor is blamable for the increase in the women demands towards cesarean delivery: a cross-sectional study. Facts Views Vis Obgyn. 2017;9(4):175-80.

[5]   Khan IA, Malik N, Mishra R, Tiwari HC, Shahi V. Awareness, attitude and willingness to receive labour analgesia among pregnant women attending maternity hospitals in Eastern UP. Clin Epidemiol Global Health. 2022; 18:101157.

[6]   Ramsay MA. John Snow, MD: anaesthetist to the Queen of England and pioneer epidemiologist. Proc (Bayl Univ Med Cent). 2006; 19:24-8.

[7]   Fergus P. Meehan. Historical review of caudal epidural analgesia in obstetrics. Midwifery.1987; 3:39-45.

[8]   Anim-Somuah M, Smyth RM, Cyna AM, Cuthbert A. Epidural versus non-epidural or no analgesia for pain management in labour. Cochrane Database Syst Rev. 2018;5(5): Cd000331.

[9]   Hillmann BR, Stamm AMNdF. Knowledge, attitude and practice regarding pharmacological methods of labor analgesia. Brazil J Pain. 2019; 2:14-9.

[10]   Kearns RJ, Lucas DN. Neuraxial analgesia in labour and the foetus. Best Pract Res Clin Anaesthesiol. 2023;37(1):73-86.

[11]   Endalew NS, Tawuye HY, Melesse DY. Knowledge and attitude towards pain relief in labor among final year midwifery students: A cross-sectional study. Int J Surg Open. 2020; 24:3842.

[12]   Grant EN, Tao W, Craig M, McIntire D, Leveno K. Neuraxial analgesia effects on labour progression: facts, fallacies, uncertainties and the future. Int J Obstet Gynaecol. 2015;122(3):288-93.

[13]   Li X, Wu C, Zhou X, Zhang J, Lu H, Chen S, et al. Influence of painless delivery on the maternal and neonatal outcomes under the guidance of new concept of labor. Am J Transl Res. 2021;13(11):12973-9.

[14]   Barooti E MB, Honarmand S, Moshari M, Alshohadaei SMS. Investigating the association of regional anesthesia during labor with postpartum depression. Anaesth Pain Intensive Care. 2019;3(23).

[15]   Wong CA. Neuraxial Labor Analgesia: Does It Influence the Outcomes of Labor? Anesth Analg.

2017;124(5):1389-91.

[16] Wang TT, Sun S, Huang SQ. Effects of Epidural Labor Analgesia with Low Concentrations of Local Anesthetics on Obstetric Outcomes: A Systematic Review and Meta-analysis of Randomized Controlled Trials. Anesth Analg. 2017;124(5):1571-80.15.

[17] Gupta S, Partani S. Neuraxial techniques of labour analgesia. Indian J Anaesth. 2018;62(9):658-66.

[18] Workie MM, Chekol WB, Fentie DY, Ahmed SA, Bizuneh YB. Assessment of Awareness, Attitude and Desire for Labor Analgesia and Associated Factors Among Pregnant Women in Ethiopia: A Cross-Sectional Study. Pain Ther. 2021;10(1):363-76.

[19] Daniel WW. Biostatistics: a foundation for analysis in the health sciences: Wiley; 1978.

[20] Prakash A, Yadav A, Karim H, Sahoo S, Jena P, Aman K. Knowledge, awareness and acceptance of labor analgesia among antenatal women in a remote Island: A questionnaire-based study. Br J Med Med Res. 2017;21(10):1-7.

[21] Yadav A, Karim HMR, Prakash A, Jena P, Aman K. Correlation of different parity and school education with acceptance of labor analgesia among antenatal women: A questionnaire-based study. Saudi J Anaesth. 2018;12(2):287-291.

[22] Yusoff MSB. ABC of response process validation and face validity index calculation. Educ Med J. 2019;11(10.21315).

[23] Van der Gucht N, Lewis K. Women's experiences of coping with pain during childbirth: a critical review of qualitative research. Midwifery. 2015;31(3):349-58.

[24] Vosoughian M DS, Dahi M, Moshari M, Tabashi S, Madadi F. Midwives' Attitudes to Painless Delivery: An Observational Study. Arch Anesth & Crit Care. 2023; 9:401-5.

[25] Aziato L, Kyei AA, Deku G. Experiences of midwives on pharmacological and non-pharmacological labour pain management in Ghana. Reprod Health. 2017;14(1):128.

[26] Sharma M, Dhungel S, Niroula S, Karki M. Knowledge and Acceptance of Labour Analgesia in Pregnant Women. J Nepal Health Res Counc. 2018;16(3):302-6.

[27] Hosseinzadeh F, Madani ZH, Rad RS, Soltanipour S, Sorouri ZR, Biazar G, et al. Maternal Attitude and Knowledge Regarding Painless Labor: A Report from a Referral Hospital in Northern Iran. Anesth Pain Med. 2023;13(5).