Neuroaxial analgesia in labor: effects on maternal and neonatal outcomes

Analgesia neuroaxial no trabalho de parto: efeitos sobre desfechos maternos e neonatais

Anestesia neuroaxial en el trabajo de parto: efectos sobre desenlaces maternos y neonatales

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Abstract

Objective: To compare maternal and neonatal outcomes of women who used and did not use neuraxial analgesia during labor.

Methods: A cross-sectional, comparative, documentary study, with retrospective data collection, carried out at a tertiary reference maternity hospital in Ceará. Sample size was calculated by the difference between two proportions: vaginal births with and without analgesia, with 130 women for each group, totaling 260 medical records. Data collection took place between July 2019 and February 2020. Student's t test, Mann-Whitney U test, Pearson's chi-square test, Fisher's exact test and the IBM SPSS program were used.

Results: The group with analgesia had a higher mean number of prenatal consultations (8.24; p<0.001), greater exposure to induction (74; 56.9%; p<0.001), with use of oxytocin (57; 43.8%; p<0.001), longer duration of active labor (mean: 392 min; p<0.001) and expulsive period (mean: 85.3 min; p<0.001), higher frequency of episiotomy (7; 7.9%; p=0.03), by cesarean section (41; 31.5%; p<0.001), and heavier babies were born (mean: 3.28 kg; p=0.007).

Conclusion: The use of analgesia is associated with a greater frequency of obstetric interventions as well as an increase in the duration of labor. Regarding neonatal outcomes, the group with analgesia gave birth to heavier newborns; Furthermore, no association was observed with the Apgar score, nor referrals to high-risk units.

Resumo

Objetivo: Comparar os desfechos maternos e neonatais de mulheres que usaram e não usaram analgesia neuroaxial durante o trabalho de parto.

Métodos: Estudo transversal comparativo, documental, com coleta retrospectiva de dados, realizado em uma maternidade terciária de referência no Ceará. O tamanho da amostra foi calculado pela diferença entre duas proporções: partos vaginais com e sem analgesia, sendo 130 mulheres para cada grupo, totalizando 260 prontuários. A coleta de dados ocorreu entre julho de 2019 e fevereiro de 2020. Foram usados os testes *t* de Student, U de Mann-Whitney, qui-quadrado de Pearson, exato de Fisher e o programa IBM SPSS.

Resultados: O grupo com analgesia apresentou maior média de consultas pré-natal (8,24; *p*<0,001), maior exposição à indução (74; 56,9%; *p*<0,001), com uso de ocitocina (57; 43,8%; *p*<0,001), maior duração do trabalho de parto ativo (média: 392 min; *p*<0,001) e do período expulsivo (média: 85,3 min; *p*<0,001), maior frequência de episiotomia (7; 7,9%; *p*=0,03), de parto cesárea (41; 31,5%; *p*<0,001), e pariram bebês mais pesados (média: 3,28 kg; *p*=0,007).

Conclusão: O uso de analgesia está associado à maior frequência de intervenções obstétricas, bem como ao aumento na duração do trabalho de parto. Quanto aos desfechos neonatais, o grupo com analgesia pariu

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recém-nascidos mais pesados; além disso, não foi observada associação com o escore de Apgar, nem encaminhamentos para unidades de risco.

Resumen

Objetivo: Comparar los desenlaces maternos y neonatales de mujeres que recibieron anestesia neuroaxial durante el trabajo de parto y las que no recibieron.

Métodos: Estudio transversal comparativo, documental, con recopilación retrospectiva de datos, realizado en una maternidad de tercer nivel de referencia en el estado de Ceará. El tamaño de la muestra se calculó mediante la diferencia entre dos proporciones: partos vaginales con y sin anestesia, con 130 mujeres en cada grupo, 260 historias clínicas en total. La recopilación de datos se realizó entre julio de 2019 y febrero de 2020. Se utilizaron las pruebas *t* de Student, U de Mann-Whitney, ji cuadrado de Pearson, exacto de Fisher y el programa IBM SPSS.

Resultados: El grupo con anestesia presentó un mayor promedio de consultas prenatales (8,24; $p<0,001$), una mayor exposición a la inducción (74; 56,9 %; $p<0,001$), con uso de oxitocina (57; 43,8 %; $p<0,001$), una duración mayor del trabajo de parto activo (promedio: 392 min; $p<0,001$) y del período expulsivo (promedio: 85,3 min; $p<0,001$), una mayor frecuencia de episiotomía (7; 7,9 %; $p=0,03$), de parto por cesárea (41; 31,5 %; $p<0,001$), y parieron bebés más pesados (promedio: 3,28 kg; $p=0,007$).

Conclusión: El uso de anestesia está asociado a una mayor frecuencia de intervenciones obstétricas, así como también al aumento de la duración del trabajo de parto. Respecto a los desenlaces neonatales, el grupo con anestesia parió recién nacidos más pesados. Además, no se observó relación con el puntaje de Apgar, ni derivaciones a unidades de riesgo.

Introduction

The birth of a child is a unique and exciting moment for a woman. However, pain during labor can be intense among women in labor, and pain intensity varies, making it an important aspect of each pregnant woman's experience of birth. Thus, some professional actions can positively impact a woman's experience with childbirth.[1]

As physiological responses influence both maternal and fetal well-being and the course of labor itself, pain can have serious consequences for the mother and fetus if it is not controlled during labor.[1] Pain, stress and anxiety lead to the release of cortisol and catecholamines, which can cause an increase in uncoordinated uterine contractions and decreased uterine blood flow (with changes in fetal heart rate) and increased cardiac output and maternal blood pressure.[2,3]

Pain also causes an increase in the plasma concentration of endorphins, lactate and fatty acids, generating maternal and fetal metabolic acidosis. Furthermore, maternal hyperventilation occurs in response to pain, generating maternal respiratory alkalosis, reducing oxygen transport to the fetus. Therefore, adequate pain control can directly benefit the mother and indirectly the fetus, reducing painful uterine contractions (caused by increased heart rate, cardiac output and blood pressure) by reducing the secretion of maternal catecholamines, in addition to benefiting the fetus (by cease maternal hyperventilation).[1,3]

Therefore, professionals must develop strategies to reduce pain, stress and anxiety during this period. However, they must involve women in decision-making before choosing the modality to reduce pain during childbirth.[4]

The maternal request for analgesia during childbirth is sufficient for it to be carried out, regardless of the stage of birth, and is a recommended practice in obstetric care.[4] Given global recommendations, we emphasized the need to reduce unnecessary interventions and use more alternative technologies, such as non-pharmacological methods of labor pain relief (e.g., breathing exercises, hypnosis, distraction techniques, continuous support, acupressure, acupuncture, reflexology, aromatherapy, transcutaneous electrical nerve stimulation (TENS)) as well as medical techniques, including epidural analgesia, combined spinal-epidural, use of nitrous oxide and opioid injection.[5,6]

The use of analgesic medical techniques to alleviate labor pain has become more common. Neuraxial analgesia (also called spinal or regional) has been considered the most effective, as it relieves pain while preserving movement and consciousness. This analgesia is subdivided into two types: epidural (or epidural) and spinal anesthesia, which can be combined (spinal-epidural or double-block).[7,8]

Epidural analgesic solutions are applied through a catheter in the lumbar region of the spine (between the vertebrae), in the epidural space (in the outermost part of the spinal space). and infusion can be done as a bolus (continuous or using a pump

controlled by patients). Lower concentrations of local anesthetic (when administered together with an opioid) allow women to maintain their ability to move, actively participating during labor. Spinal analgesia does not allow the use of a catheter, and the injection is performed only once into the liquid surrounding the spine.[6,9]

In combination spinal-epidural (epidural-spinal) analgesia, administration of a single injection of local anesthetic (or opioid) into the cerebral spinal fluid and insertion of the epidural catheter are performed for continuous relief. This combination has the advantage of a rapid onset of action.[6,7] This results in great pain relief with virtually no motor blockage, i.e., regardless of pain intensity and the response generated, it is important that the method used to alleviate it is effective and safe for mother and child.[6]

However, there are disagreements regarding the use of epidural analgesia and its impact on the results and evolution of labor. The outcomes of pharmacological interventions to control labor pain vary greatly and there is no consensus on the main results.[10] Studies have shown its relationship with the following outcomes: (1) reduction in cesarean section, episiotomy and severe perineal trauma rates; and (2) increase in the use of low doses of intrapartum analgesia, with simultaneous addition of oxytocin in the first stage of labor.[11] The occurrence of instrumental birth is related to increased risk of neonatal morbidity.[12]

In addition to the divergences about outcomes reported in the literature, we found a lack of comparative data analyzing the relationship between the use of neuraxial analgesia and maternal and neonatal outcomes in different regions in Brazil. This makes it difficult to recognize the use of neuraxial analgesia in the Brazilian Health System (SUS - *Sistema Único de Saúde*) as well as the outcomes related to this practice, which justified the present study. Our hypothesis was that parturient women exposed to neuraxial analgesia during labor are subjected to additional interventions, with divergent results, compared to those not exposed to this practice. Therefore, the objective was to compare maternal and neonatal outcomes in women who used and did not use neuraxial analgesia during labor.

Methods

This was an analytical, documentary, retrospective cross-sectional study, carried out based on the STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) checklist, developed from July 2019 to February 2020 at a tertiary reference maternity hospital in Fortaleza (Ceará), which provides highly complex outpatient and hospital care to women and newborns. The choice of location, *Maternidade Escola Assis Chateaubriand* (MEAC), was intentional, as this is the only public service in the state that provides analgesia during labor until the study is completed.[13]

In 2019, 4,451 births took place at the institution, of which 2,695 (60.5%) were cesarean sections and 1,756 (39.5%) were vaginal births; of the latter, 114 (6.5%) underwent analgesia.[14] Sample size was calculated using the estimate of the difference between two proportions (significance level: 5%; test power: 80%).[15] The proportion of group 1 (vaginal births with analgesia) was 73% and that of group 2 (vaginal births without analgesia) was 83%. Sample size was 260, with 130 for each group.

Thus, medical records of women who went into labor (with a live, single fetus, cephalic presentation, at term and gestational age of 37-41 weeks and six days) were included. Medical records with elective cesarean sections, fetal malformation and insufficient data for the study's important variables were excluded. Sampling was for convenience, and the most recent medical records were selected to enable greater data reliability, homogeneity in relation to the institutional analgesia protocol and less probability of bias regarding time.

Data collection occurred as follows: 1) Survey of patients who met the inclusion criteria; 2) Search for medical records in the rooming-in and, in case of medical discharge, in the Medical Archive and Statistics Service; 3rd) filling out the data collection instrument. To survey patients who underwent analgesia, an institution's neuraxial analgesia minute book was used, where all patients who underwent this procedure are recorded. For data collection, a structured instrument was used, consisting of three topics: I. Socioeconomic data: II. Obstetric data

(prenatal; labor; analgesia; expulsion period; type of birth and perineal outcome); and III. Neonatal conditions (newborn weight, Apgar score and referral).

In data analysis, numerical variables were presented as mean and percentage. In categorical variables, data were presented as frequency and prevalence rate, in order to investigate possible associations between obstetric and neonatal outcomes and neuraxial analgesia. In the analysis of group characteristics, Student's t, Mann-Whitney's U, Pearson's chi-square and Fisher's exact tests were used. A significance level of 5% was adopted. The Research Electronic Data Capture (REDCap) data manager was used and statistical analyzes were performed using the Statistical Product and Service Solutions (SPSS) statistical program.

The study was submitted to *Plataforma Brasil* and was assessed and approved by the MEAC Research Ethics Committee (CAAE (*Certificado de Apresentação para Apreciação Ética* - Certificate of Presentation for Ethical Consideration) 14194819.0.0000.5050; Opinion: 3.425.854). The signing of the Term of Faithful Depositary guaranteed confidentiality of all women's identification data, with ethical aspects relating to research with human beings being observed, in accordance with the rules of the Brazilian National Health Council (Resolution 466/2012).

Results

A total of 260 medical records of women who went into labor at the institution were analyzed. Regarding study participant characterization, the mean maternal age was 22.84 years (range: 14-44 years). The majority lived with their partner (183; 70.7%), did not have paid work (178; 68.7%), lived in Fortaleza (228; 87.7%), attended high school (167; 64.2%) and declared themselves as brown (218; 84.2%). Regarding the use of analgesia, these variables were similar in both groups and did not present relevant statistical differences. The group with analgesia had a higher mean number of prenatal consultations (8.24; p<0.001), greater exposure to induction (74; 56.9%; p<0.001), use of oxytocin (57; 43.8%; p<0.001), longer duration of active labor (mean: 392 min; p<0.001) and expulsion period (mean: 85.3 min; p<0.001), higher frequency of episiotomy (7; 7.9%; p=0.03) and cesarean section (41; 31.5%; p<0.001). Second-degree laceration was associated with the group without analgesia (57; 43.8%; p=0.01). The indications for cesarean section due to progression arrest (p<0.001) and acute fetal distress (p=0.01) were statistically associated with the group that used neuraxial analgesia, suggesting a relationship with the cesarean section rate of parturient women who received analgesia. A significant association was also found between women without neuraxial analgesia and the choice to give birth in the semi-sitting (p=0.01) and lying down (p=0.04) positions (Table 1).

Regarding the type of neuraxial analgesia during labor, the most used technique was epidural (100; 76.9%), followed by combined spinal-epidural (15; 11.5%), and spinal anesthesia (14; 10.8%). Women were predominantly in active labor at the start of analgesia (cervical dilation: 7 cm). A minority of women in labor asked for increased analgesia (30; 23.3%), and nine (7%) had adverse effects as a result of this procedure (Table 2).

Regarding neonatal outcomes, patients undergoing analgesia gave birth to heavier babies compared to those in the group without analgesia (p=0.007) (Table 3).

Discussion

The relationship between a greater number of prenatal consultations and the use of analgesia could suggest that these pregnant women sought greater participation during this period, which would be ideal for clarifying doubts and obtaining reliable information about the birth process. We emphasized the importance of adequate knowledge of professionals who provide prenatal care in relation to childbirth care practices, their risks and benefits, as health education during pregnancy is fundamental when aiming at women's autonomy, in addition to a positive and satisfactory birth experience.

Table 1. Association between obstetric variables and expulsion period (maternal outcomes) according to the use of neuraxial analgesia

Variables	Groups		p-value *
	With analgesia n(%)	No analgesia n(%)	
Parity			0.21
Nulliparous	110(84.6)	103(79.2)	
Prenatal consultation (mean)	8.24	6.89	<0.001**
Pregnancy risk classification			0.37
Usual risk	98(75.4)	104(80.0)	
High risk	32(24.6)	26(20.0)	
Induction of labor			<0.001
Yes	74(56.9)	28(21.5)	
No	56(43.1)	102(78.5)	
Induction/conduction type			
Misoprostol	22(16.9)	15(11.5)	0.21
Oxytocin	57(43.8)	17(13.1)	<0.001
Performing amniotomy	25(19.2)	24(18.5)	0.87
Duration of active labor (min)	392.1	260.7	<0.001**
Duration of the expulsion period (min)	85.3	41.1	<0.001**
Shoulder dystocia			0.47
Yes	2(2.3)	6(4.8)	
No	84(97.7)	119(95.2)	
Episiotomy			0.03
Yes	7 (7.9)	2(1.6)	
No	82 (92.1)	121(98.4)	
Type of birth			
Vaginal	88(67.7)	124 (95.4)	<0.001
Cesarean section	41(31.5)	5 (3.8)	<0.001
Forceps	1(0.8)	1 (0.8)	1.0
Perineal laceration			
1st degree	32(24.6)	36(27.7)	0.57
2nd degree	38(29.2)	57(43.8)	0.01
3rd degree	1(0.8)	6(4.6)	0.05
4th degree	1(0.8)	-(-)	1.0
Absence of laceration	17(13.1)	26(20)	0.13
Indications for cesarean section			
Progression arrest	22(16.9)	0(0)	<0.001
Acute fetal distress	11(8.5)	2(1.5)	0.01
Cephalopelvic disproportion	8(6.2)	3(2.3)	0.12
Premature placental abruption	2(1.5)	0(0)	0.15
Gestational diabetes mellitus	1(0.8)	0(0)	0.31
Positions most adopted during childbirth			
Semi-seated	48(36.9)	68(52.3)	0.01
Use of stool	23(17.7)	21(16.2)	0.74
Left lateral decubitus	6(4.6)	6(4.6)	1.0
Lying down	6(4.6)	15(11.5)	0.04
Squatting	3(2.3)	9(6.9)	0.07

*Pearson's chi-square test; **Mann-Whitney test

Table 2. Neuraxial analgesia procedure variables during labor

Variables	Group with analgesia n(%)
Types of neuraxial analgesia	
Epidural	100(76.9)
Combined spinal-epidural	15(11.5)
Spinal anesthesia	14(10.8)
Reinforcement/repeated	
Yes	30(23.3)
No	99(76.7)
Adverse effects	
Yes	9(6.9)
No	121(93.1)

Table 3. Classification of newborns according to groups with and without neuraxial analgesia

Variables	Group with analgesia mean (min. - max.)	Group without analgesia mean (min. - max.)	p-value*
Apgar score (1st minute)	8.24(3-9)	8.32(4-9)	0.32**
Apgar score (5th minute)	8.92(4-10)	8.89(7-10)	0.46**
Body weight (kg)	3.28(2.34-4.49)	3.15(2.27-4.34)	0.007**
Newborn referral	n(%)	n(%)	
Rooming-in	125(96.2)	117(90.0)	0.051
Medium risk nursery	3(2.3)	6(4.6)	0.5
NICU***	2(1.5)	7(5.4)	0.17

* Pearson's chi-square test; ** Mann-Whitney test; *** NICU - Neonatal Intensive Care Unit.

There are many studies on maternal and fetal repercussions related to the use of analgesia, mainly regarding the ideal time to start analgesia, increase in the number of cesarean sections, greater chance of operative vaginal birth and labor duration prolongation.[1] However, divergences have been observed in the literature regarding birth outcomes. A review of systematic reviews and their randomized clinical trials was published in Cochrane to identify such outcomes in studies comparing pharmacological interventions (in pain management) with other interventions, placebo or no intervention, and the authors concluded that the results of pharmacological interventions vary greatly between studies.[10]

Despite the prevalence of vaginal birth in both groups, in the present study, the cesarean section rate was higher in the group with analgesia (compared to the group without analgesia), mainly due to acute fetal distress (AFS) and progression arrest. Other causes such as cephalopelvic disproportion and secondary arrest of descent were identified in another study.[16] And regarding the type of birth, results of 2,726 nulliparous, cephalic, singleton and full-term births analyzed, comparing the effect of analgesia, observed that, in both spontaneous and induced labor, the cesarean section rate was significantly higher in the presence of analgesia, corroborating the finding in the present study.[17]

Regarding the increased risk of instrumental birth in users of epidural analgesia, the results identified by Srebnik *et al.* (2020) are confirmed.

However, they differ regarding the association with a lower risk of cesarean section.[18] A retrospective cohort demonstrated an increased risk of instrumental vaginal birth associated with analgesia, but a lower risk of cesarean section. The study points out two factors - advanced maternal age and primiparity - that contribute to the increased risk of instrumental birth and suggests carefully considering the indication of analgesia in these cases.[19] Another study reinforces this finding, being a prospective cohort, carried out in Ireland, with 1,221 women, in which those who received analgesia were more likely to need intrapartum intervention, being three times more likely to have a vacuum-assisted birth and eleven times to have a forceps-assisted birth compared to spontaneous birth.[20]

However, in a retrospective cohort of 744 nulliparous women, although the analgesia group had higher rates of cesarean sections and operative vaginal birth, the result was not statistically significant.[21] A study that systematically analyzed the effect of epidural analgesia on the progress of labor and on women's pelvic floor muscles, from the perspective of electromyography, also found no significant difference in the percentage of forceps.[22]

Therefore, despite evidence pointing to an association between the use of analgesia and an increased risk of instrumental birth, there are divergences in the results, which highlights the need for future research that analyzes cases on an individual basis as well as how to use this technique practice, in order to clarify and mitigate concerns and fears of professionals who manage pain during labor. A systematic review on the use of epidural analgesia reported that analgesia administration may make parturient women more likely to require forceps compared to opioid administration. However, in studies carried out since 2005, a lower concentration of local anesthetic and more modern analgesia techniques were observed, which may have contributed to the decrease in the rate of operative vaginal birth.[6] This leads to the inference that divergences between findings may be associated with other variables related to care, reinforcing the importance of discouraging the indiscriminate use of interventions during labor.

In the present study, an association was also found between the use of analgesia and increases in the duration of active labor and the expulsion period. Results of a study that assessed the effect of epidural analgesia, from the perspective of electromyography, corroborate this finding, which observed that women who implemented epidural analgesia had a longer labor period.[22] Likewise, other studies indicated that both the first and second stages of labor were longer, leading to an increase in the total duration of labor.[21,23-27]

It is important to highlight that prolonged labor increases the likelihood of longer exposure to epidural analgesia and greater chances of instrumental birth. Therefore, these possible confounding factors must be questioned whether the predictor of instrumental birth is epidural analgesia or prolonged and laborious labor itself.[28]

Regarding the period of labor, a study found that women who underwent analgesia earlier (with dilation 2–4 cm versus >4 cm) had a shorter duration of labor.[21] However, with regard to the stage of labor, results of a study that analyzed the effects of analgesia at different moments of cervical dilation (<3 cm; between 3–4 cm; and between 4–6 cm), it was verified that the duration of the first and second stages and the total duration of labor were longer when compared to the control group, diverging further from the first stage of dilation, in which a greater increase was observed when analgesia was administered with less dilation.[25]

In relation to childbirth care, the findings of this research confirm some studies that showed a relationship between pharmacological analgesia and the use of oxytocin. A retrospective study concluded that women using epidural analgesia were more likely to receive oxytocin during labor.[18] In Japan, a retrospective cohort study with more than 5,000 women showed that combined spinal-epidural analgesia was associated with increased use of oxytocin, prolonged labor duration and instrumental birth; however, no significant difference in the incidence of cesarean section.[29]

The literature presents a lack of consensus regarding the effects of analgesia in the different stages of cervical dilation and the subsequent need for

intervention with oxytocin. On the one hand, a study conducted showed that analgesia administration was significantly related to an increase in the rate of oxytocin use in all stages of cervical dilation examined (<3 cm; between 3–4 cm and between 4–6 cm), with particular emphasis on the first stage, where the difference was more pronounced.[25] In contrast, a study that adopted a systematic approach and included electromyographic analysis did not detect significant variations in the use of oxytocin in women undergoing epidural analgesia, suggesting that other factors may influence the administration of this drug during labor.[22] These divergences point to the complexity of labor management and the need for a more in-depth understanding of the variables involved.

The results presented in the present study showed that the group with analgesia was able to assume more vertical positions during the expulsion period and had a lower rate of second-degree perineal laceration compared to parturient women without analgesia. This may be related to the longer expulsive period in women under neuraxial analgesia, generating adequate relaxation of the perineum due to the bulging movement of the cephalic pole.

In this context, an association was also verified between the use of analgesia and the rate of episiotomy. A study differs in relation to episiotomy, not having found a significant difference, however, they corroborate the association found with a longer period of labor and a lower risk of presenting perineal laceration.[22] It appears that there is variability regarding clinical decision-making, which must be cautious and based on an individualized assessment of the progress of labor and patient preferences. The divergence found in the results related to interventions adopted during labor highlights the importance of future research for more effective and evidence-based management.

Regarding the neonatal outcomes observed in this study, there were no statistically significant differences regarding Apgar scores in the first and fifth minutes, nor regarding referral to the Neonatal Intensive Care Unit (NICU). However, the group that received analgesia showed an association with the birth of heavier babies; an outcome that was also observed in a retrospective cohort.[21] In this context, a retrospective cohort study aimed at investigating the association between neuraxial analgesia and neonatal outcomes of 2,343 singletons, found a statistical association between nulliparous women who received analgesia and a significantly higher incidence of Apgar scores below 7 in the first and fifth minutes, presence of meconium amniotic fluid and fetal cardiac decelerations.[30] Other research observed the association between epidural analgesia during labor and an increased risk of neonatal infection in full-term newborns born vaginally.[31]

In the literature, there is no consensus between neonatal outcomes related to analgesia during labor and labor. A retrospective cohort carried out with 850 women, in Minas Gerais, identified an association with a greater chance of outcomes such as: Apgar score <7 in the first minute ($p<0.0001$), resuscitation maneuvers ($p<0.001$) and referral to NICU ($p=0.004$), especially among high-risk pregnant women.[32] However, a multicenter study carried out in Spain identified no significant difference in perinatal outcomes between the early and late phases, except for a higher proportion of Apgar scores <7 in the first minute.[28] In Japan, a retrospective cohort study (5,000 women) showed an association between combined spinal-epidural analgesia and Apgar <7 in the first minute; however, it did not identify a significant difference in the incidence of cesarean section or Apgar <7 in the fifth minute.[29]

On the other hand, there are studies that point to a lack of association between analgesia and neonatal morbidity. A cohort study carried out in Spain analyzed 2,750 births and did not identify any relationship, not even with pH values in the umbilical artery and Apgar scores <7 in the fifth minute; however, it concluded that instrumental birth is associated with an increased risk of neonatal morbidity.[12] A systematic review on the topic showed that there were no differences between admission to the NICU and Apgar <7 in the fifth minute of a newborn's life.[6] The results of this study confirm these results[6] and lead to the inference that the finding is possibly being indirectly affected by the relationship between instrumental birth and neonatal morbidity in the studies that found an association.

Understanding the origin of the pain process, as well as maternal and neonatal outcomes, paying attention to the factors that can influence them, is essential to provide care with as few undesirable adverse effects as possible, quality care, holistic and individualized to their needs. We emphasized the importance of including women in the decision-making process regarding pain relief strategies, which can promote a better experience and satisfaction with childbirth. We highlighted here the role of nursing in favoring the empowerment of women using good practices.

The limitations of this research are related to the use of secondary sources, subject to incomplete records, inadequate completion of graphical representation of the evolution of labor as well as lack of information on the progress of labor, reinforcement, technique and dosage of analgesia.

For future studies, we suggest carrying out prospective research that can assess the levels of knowledge and updating of both professionals and women regarding obstetric recommendations, including investigating how prenatal education can impact the choice at the time of labor and satisfaction maternal. We also suggest carrying out studies that show the percentage of parturient women who request neuraxial analgesia spontaneously as well as those who accept analgesia when it is suggested. It is important to develop research that analyzes obstetric and neonatal outcomes from habitual and high-risk subgroups as well as the relationship with outcomes such as instrumented birth.

Conclusion

The use of neuraxial analgesia was associated with increased prenatal visits and interventions during labor and birth, including high rates of oxytocin labor, episiotomy, increased duration of active labor, and expulsive period. Analgesia was associated with a greater number of cesarean sections, acute fetal distress, progression arrest, and having a newborn with a higher birth weight. In relation to the group of parturient women without analgesia, there was a lower rate of cesarean section and a predominance of semi-sitting and lying positions during the expulsion period, which adversely affect the progress of labor.

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Collaborations

Souza MRT, Carneiro JL, Farias LMVC, Costa CC, Vasconcelos CM, Lima MOP and Damasceno AKC contributed to study design, data analysis and interpretation, article writing, relevant critical review of intellectual content and approval of the final version to be published.

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