Michalczyk Michał, Torbé Dorota, Torbé Andrzej. Analysis of the frequency of cesarean sections, vaginal interventions and birth canal injuries in various methods of anesthesia during labor. Journal of Education, Health and Sport. 2018;8(9):465-474. eISNN 2391-8306. DOI http://dx.doi.org/10.5281/zenodo.1403954
http://ojs.ukw.edu.pl/index.php/johs/article/view/5869

The journal has had 7 points in Ministry of Science and Higher Education parametric evaluation. Part b item 1223 (26/01/2017).
1223 Journal of Education, Health and Sport eISSN 2391-8306 7

© The Author(s) 2018;
This article is published with open access at Licensee Open Journal Systems of Kazimierz Wielki University in Bydgoszcz, Poland
Open Access. This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author (s) and source are credited. This is an open access article licensed under the terms of the Creative Commons Attribution Non commercial license Share alike.
(http://creativecommons.org/licenses/by-nc-sa/4.0/) which permits unrestricted, non commercial use, distribution and reproduction in any medium, provided the work is properly cited.

The authors declare that there is no conflict of interests regarding the publication of this paper.

Received: 02.08.2018. Revised: 18.08.2018. Accepted: 24.08.2018.

Analysis of the frequency of cesarean sections, vaginal interventions and birth canal injuries in various methods of anesthesia during labor

Michalczyk Michał[1], Torbé Dorota[2], Torbé Andrzej[1]

[1]Chair and Department of Obstetrics and Gynecology, Pomeranian Medical University in Szczecin, Powstańców Wielkopolskich Av. 72, 70-111 Szczecin Poland

[2]Doctoral Studium of the Faculty of Health Sciences, Pomeranian Medical University in Szczecin, Żołnierska 54 str., 71-210 Szczecin, Poland

Corresponding author:

Prof. dr hab. n. med. Andrzej Torbé

Chair and Department of Obstetrics and Gynecology

Pomeranian Medical Academy in Szczecin

al. Powstańców Wielkopolskich 72

70-354 Szczecin

Abstract

Aim: The aim of this study was to analyze and compare the frequency of cesarean sections, vaginal interventions and birth canal injuries in various methods of anesthesia during labor.

Material and methods: 160 pregnant women ≥ 37 weeks, which attempted vaginal delivery in the Department of Obstetrics and Gynecology of the Pomeranian Medical University in Szczecin, were divided into four groups:

1. PCEA (n = 40) women giving birth under patient-controlled epidural anesthesia (PCEA) in a horizontal position;
2. Pethidine (n = 30) women giving birth subjected to analgesia by parenteral supply of pethidine;
3. Fentanyl (n = 30) women giving birth subjected to analgesia by parenteral supply of fentanyl;
4. Control (n = 60) women giving birth without analgesia.

In each group the frequency of intrapartum caesarean sections, episiotomies, injuries of birth canal and of uterine revision was evaluated.

Results: No significant differences in the incidence of completion of delivery by cesarean section between the studied groups of women was observed. Also the incidence of minor injuries of birth canal was comparable. Analysis of the frequency of episiotomies and of postpartum instrumental control of uterine cavity showed no significant differences between the studied groups.

Conclusions: Both, the use of epidural analgesia in the formula PCEA and parenteral use of an opioid analgesics during delivery, do not affect the frequency of completion of labor by caesarean section, the incidence of injuries of the birth canal, the incidence of instrumental inspection of the uterine cavity and are not associated with an increased risk of episiotomy.

Key words: birth canal injury, cesarean section, episiotomy, fentanyl, patient-controlled epidural anesthesia, pethidine, revision of the uterine cavity

Introduction

The pain experienced by women during labor is the main cause of fear associated with physiological labor. Because pain and fear can adversely affect the progress of labor one of the main tasks of modern obstetrics is to act towards reducing the pain to a minimum [1]. However, it is extremely important that modern methods of intrapartum analgesia must be enough effective on the one hand, and on the other as little as possible affect on the course of labor [2]. Currently the most commonly used pharmalogical methods of analgesia in labor are epidural anesthesia and parenteral administration of opioid drugs. Both methods are expected to have a broad safety profile for both the mother and the infant [3].

The aim of this study was to analyze and compare the frequency of cesarean sections, vaginal interventions and birth canal injuries in various methods of anesthesia during labor.

Material and methods

The study included 160 pregnant women ≥ 37 weeks, which attempted vaginal delivery in the Department of Obstetrics and Gynecology of the Pomeranian Medical University in Szczecin in 2013-2017. The study was approved by the University Bioethic Committee No. KB-0012/56/13.

The women were divided into four groups:

1. PCEA (n = 40) women giving birth under patient-controlled epidural anesthesia (PCEA) in a horizontal position;
2. Pethidine (n = 30) women giving birth subjected to analgesia by parenteral supply of pethidine;
3. Fentanyl (n = 30) women giving birth subjected to analgesia by parenteral supply of fentanyl;
4. Control (n = 60) women giving birth without analgesia.

In each group the frequency of intrapartum caesarean sections, episiotomies, injuries of birth canal and of uterine revision was evaluated.

Statistical analysis was performed using the statistical program STATA 11. Statistical differences between groups were made using analysis of variance test (ANOVA) test or the Kruskal-Wallis test.

Results

No significant differences in the incidence of completion of delivery by cesarean section between the studied groups of women was observed (Table 1).

Table 1. Comparison of the frequency of vaginal deliveries and cesarean sections between the studied groups.

	Vaginal delivery		Cesarean section		
Group	N	%	N	%	p
PCEA	33	82.50	7	17.50	NS
Pethidine	24	80.00	6	20.00	
Fentanyl	25	83.33	5	16.67	
Control	46	76.67	14	23.33	

In the studied population of women who delivered vaginally no perineal rupture of grade III or IV were observed. Incidence of minor injuries of birth canal between the studied groups was comparable (Table 2).

Table 2. Comparison of the frequency of birth canal injuries in the studied groups.

	Injuries		No injuries		p
Group	N	%	N	%	
PCEA	4	12.13	29	87.87	NS
Pethidine	10	41.67	14	58.33	
Fentanyl	9	36.00	16	64.00	
Control	7	15.22	39	84.78	

Analysis of the frequency of the postpartum instrumental control of uterine cavity showed no significant differences between the studied groups (Tab. 3).

Table 3. Comparison of the frequency of instrumental control of the uterus after delivery between the groups.

Group	Without control		Control		p
	N	%	N	%	
PCEA	27	81.82	6	18.18	NS
Pethidine	21	87.50	3	12.50	
Fentanyl	21	84.00	4	16.00	
Control	35	76.09	11	23.91	

A comparison of frequency of episiotomy revealed no significant differences between the studied groups (Tab. 4)

Table 4. Comparison of the frequency of episiotomy between the groups.

Group	Without episiotomy		Episiotomy		p
	N	%	N	%	
PCEA	9	27.27	24	72.73	NS
pethidine	10	41.67	14	58.33	
Fentanyl	13	52.00	12	48.00	
Control	17	36.96	29	63.04	

Discussion

The results of this study revealed no evidence of increased incidence ending of labor by cesarean section in PCEA patients as compared to other analyzed groups. Different results were obtained by Thorp [4] who reported an increase in the incidence of cesarean sections in the group of patients with epidural anesthesia (15.5% vs. 2.4%). Possible explanation of the fact is that at the end of the last century much higher concentration of topical analgesics (0.25% bupivacaine) were used, which with no doubt was associated with negative effects on motor function of the patient and uterine contractions [5]. Currently, solutions of bupivacaine at a concentration of 0.0625% to 0.125%, with addition of the opioid are used the most commonly. Such concentrations of locally acting analgesic does not significantly affect the motor function and uterine activity and addition of the opioid significantly

prolongs and enhances the action of local acting anesthetics. In this study, in the analgesic mixture the concentration of bupivacaine at 0.1% was used. Our own observations confirm the prevailing contemporary in the literature view that epidural anesthesia does not increase the number of cesarean sections [6-15], although the report of Pakuła et al., is conflicting [16].

The results of our study confirm also the lack of effect of epidural anesthesia on an increased incidence of injuries of the birth canal. They coincide with the report of Yiska Loewenberg-Weisband et al., [17], who in a large study of more than sixty one thousands patients have not confirmed the relationship of epidural anesthesia with increased risk of injury to the birth canal. These observations are also confirmed by the reports of other authors [18,19]. Analyzing the literature it should be noted that some researchers even emphasizes the protective effect of epidural anesthesia on the formation damage the birth canal during labor [20-22]. However, it is also possible to find reports presenting the view that epidural anesthesia contributes to increasing the percentage of damage the birth canal. Such conclusions were reached by Robinson [23], Pergialiotis et al., [24] and Naidoo [25]. However, it does not change the fact that currently the dominant opinion among most researchers is the lack of conviction about the negative impact of epidural anesthesia on the incidence of birth canal injuries during vaginal delivery.

In the opposite to our own results, most researchers report the relationship of epidural anesthesia with the increased frequency of performing the episiotomy. Newmann [26] in a big study of over 20,000 patients noted a significant increase in the frequency of performing episiotomy in the group of patients with epidural anesthesia in comparison to the control group (27.8% vs. 13.1%). A similar relationship was found by Bodner-Adler [18], Shmueli [27] and Robinson [28]. In the literature there is no clear position on this subject. Here should be cite the study of Segado-Jiménez et al. [29] whose observations are consistent with our own and does not confirm the effect of epidural anesthesia on frequency of episiotomy.

The analyzed material showed no effect of epidural analgesia onto an increased incidence of uterine curettage to evacuate placental tissues after delivery. Similar conclusions were reached by Weigl et al. [30]. However results of our study do not confirm observations of Ashwal [31], who believes that epidural anesthesia is

an independent risk factor of retaining placental tissues after delivery. It should however be borne in mind that in the literature there are few reports relating specifically to this problem.

Conclusion:

Both, the use of epidural analgesia in the formula PCEA and parenteral use of an opioid analgesics during delivery, do not affect the frequency of completion of labor by caesarean section, the incidence of injuries of the birth canal, the incidence of instrumental inspection of the uterine cavity and are not associated with an increased risk of episiotomy.

Bibliography

1. Borodij A, Kopko J, Bomba-Opoń D. Czy immersja wodna może być alternatywą dla znieczulenia przewodowego porodu? Ginekol Perinatol Prakt 2016;1(3):100-106.
2. Michalczyk M, Torbé D, Torbé A. Comparison of the effect of patient-controlled epidural anesthesia (PCEA) and parenteral use of opioid analgesics on the postpartum condition of the newborn. J Educ Health Sport 2018;8(9):277-284.
3. Jones L, Othman M, Dowswell T, et al. Pain management for women in labour: an overview of systematic reviews. Cochrane Database Syst Rev 2012; 3. Art. No.: CD009234. DOI: 10.1002/14651858.CD009234.pub2
4. Thorp J, Eckert L, Ang M, [et al.]. Epidural analgesia and cesarean section for dystocia: risk factors in nulliparas. Am J Perinatol 1991;8:402-404.
5. Studd J, Crawford J, Duignan N, [et al.]. The effect of lumbar epidural analgesia on the rate of cervical dilatation and the outcome of labour of spontaneous onset. Br J Obstet Gynaecol 1980;87:1015-1021.
6. Anim-Somuah M, Smyth R, Howell C. Epidural versus non-epidural or no analgesia in labour. Cochrane Database Syst Rev 2005;19;(4).

7. Sieńko J, Czajkowski K, Światek-Zdzienicka M, Krawczyńska-Wichrzycka R. Epidural analgesia and the course of delivery in term primiparas. Ginekol Pol 2005;76, 806-811.
8. Lieberman E, O'Donoghue C. Unintended effects of epidural analgesia during labor: A systematic review. Am J Obstet Gynecol. 2002;186:31-68.
9. Liu E, Sia A. Rates of caesarean section and instrumental vaginal delivery in nulliparous women after low concentration epidural infusions or opioid analgesia: systematic review. BMJ 2004; 328:1410.
10. Sharma S, Alexander J, Messick G, [et al.]. Cesarean Delivery - A Randomized Trial of Epidural Analgesia versus Intravenous Meperidine Analgesia during Labor in Nulliparous Women. Anesthesiology 2002;96,546–551.
11. Eltzschig H, Lieberman E, Camann W. Regional Anesthesia and Analgesia for Labor and Delivery. N Engl J Med. 2003, 348, 319-332
12. Leighton B, Halpern S. The effects of epidural analgesia on a labor, maternal and neonatal outcomes: a systematic review. Am J Obstet Gynecol 2002;186(suppl. 5):69-77.
13. Smiley R. Znieczulenie zewnątrzoponowe-aktualności. Gin po Dypl 2003,;25:35-43.
14. Lach J, Marciniak R, Marcinkowski Z, [i wsp.]. Ciągłe znieczulenie zewnątrzoponowe w trakcie porodu pojedynczczej żywej ciąży. Ginekol Pol 2003;74:1173-1179.
15. Bakhamees H, Hegazy E. Does epidural increase the incidence of cesarean de-livery or instrumental labor in Saudi populations? Middle East J Anesthesiol 2000;19:693-704.
16. Pakuła D, Fras P, Sosonowski D, Sikora-Szubert A, Kalinka J. Wpływ znieczulenie zawnątrzoponowego na długość drugiego okresu porodu oraz częstość wykonywania cięcia cesarskiego w odniesieniu do czasu rozpoczęcia znieczulenia. Perinatol Neonatol Ginekol 2013; 6(4):229-234.
17. Loewenberg-Weisband Y, Grisaru-Granovsky S, Ioscovich A, Samueloff A, Calderon-Margalit R. Epidural analgesia and severe perineal tears: a literature review and large cohort study. J Matern Fetal Neonatal Med 2014;27(18):1864-1869.

18. Bodner-Adler, B., Bodner, K., Kimberger, O. et al. The effect of epidural analgesia on the occurrence of obstetric lacerations and on the neonatal outcome during spontaneous vaginal delivery. Arch Gynecol Obstet 2002;267(2):81-84.
19. Kearney R, Miller JM, Ashton-Miller JA, DeLancey JO. Obstetrical factors associated with levator ani muscle injury after vaginal birth. Obstet Gynecol 2006;107(1):144-149.
20. Eskandar O, Shet D. Risk factors for 3rd and 4th degree perineal tear. J Obstet Gynaecol 2009;29(2):119-122.
21. Jangö H et al. Modifiable risk factors of obstetric anal sphincter injury in primiparous women: a population–based cohort study. Am J Obstet Gynecol 2014;210(1):59.e1-6
22. Hauck, Yvonne L et al. Risk factors for severe perineal trauma during vaginal childbirth: A Western Australian retrospective cohort study. Women Birth 2015;28(1):16-20.
23. Robinson JN, Norwitz ER, Cohen AP, Lieberman E. Predictors of episiotomy use at first spontaneous vaginal delivery. Obstet Gynecol. 2000;96(2):214-218.
24. Pergialiotis V, Vlachos D, Protopapas A, Pappa K, Vlachos G. Risk factors for severe perineal lacerations during childbirth. Int J Gynaecol Obstet 2014;125(1):6-14.
25. Naidoo TD, J Moodley J. Obstetric perineal injury: risk factors and prevalence in a resource-constrained setting. Trop Doct 2015;45(4):252-254.
26. Newman MG, Lindsay MK, Graves W. The effect of epidural analgesia on rates of episiotomy use and episiotomy extension in an inner-city hospital J Matern Fetal Med 2001;10(2):97-101.
27. Anat Shmueli A, Benziv RG, Hiersch L, Ashwal E, Aviram R, Yogev Y, Aviram A. Episiotomy – risk factors and outcomes. J Matern Fetal Neonatal Med 2017;30(3):251-256.
28. Robinson JN, Norwitz ER, Cohen AP, Lieberman E. Predictors of episiotomy use at first spontaneous vaginal delivery. Obstet Gynecol 2000;96(2):214-218.
29. Segado Jiménez M, Arias Delgado J, Domínguez Hervella F, Casas García ML, López Pérez A, Izquierdo Gutiérrez C. Epidural analgesia in obstetrics:

is there an effect on labor and delivery? Rev Esp Anestesiol Reanim 2011;58(1):11-16.

30. Weigl W, Szymusik I, Borowska-Solonynko A, et al. The influence of epidural analgesia on the course of labor. Ginekol Pol. 2010,81,41-45.
31. Ashwal E, Melamed N, Hiersch L, Wiznitzer A, Yogev Y, Peled Y. The incidence and risk factors for retained placenta after vaginal delivery - a single center experience. J Matern Fetal Neonatal Med 2014;27(18):1897-900.