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Research Article

Evaluate the predictors of post-caesarean section pain level and Analgesic consumption: Impact of Anesthesia and Patient Demography.

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Background: Pain is a significant health concern worldwide, with chronic pain being a major contributor to disability. It is considered the fifth vital sign, and its impact on quality of life is substantial. Pregnancy is a physiological condition that brings about changes in a woman's body, including hormonal fluctuations that can affect psychological well-being. Cesarean section is a common surgical procedure, with rates varying across countries. The management of pain after cesarean section is crucial for improving patient outcomes. **Objective:**To investigate the level of pain and consumption of analgesics after cesarean section according to the type of anesthesia administered, comparing the effectiveness of different anesthesia types in managing postoperative pain. **Methodology:** This study included patients who underwent cesarean section at the Department of Obstetrics and Gynecology, Dow University Hospital. Patients were divided into groups based on the type of anesthesia administered. Pain levels were assessed using and analgesic consumption was recorded. Data were analyzed using SPSS Version 22 and a p-value of ≤ 0.05 was considered significant. **Results:** It showed that puerperas operated on under spinal anesthesia had significantly lower pain sensation ($p=0.031$) and less need for analgesic consumption in the postoperative period as compared to those operated on under general anesthesia ($p=0.024$). Increased age was associated with lower pain sensation ($p=0.014$) and need for analgesics ($p<0.05$). Higher level of education was associated with greater need for analgesics ($p=0.016$). Living in urban area was associated with greater pain sensation ($p=0.023$) and less need for analgesics ($p<0.17$). **Conclusion** Spinal anesthesia for cessarian section resulted in less pain and less need for analgesics in the postoperative period compared to general anesthesia

Keywords:

Pain management, cesarean section, anesthesia, analgesics, postoperative pain, quality of life

INTRODUCTION:

Pain is a pervasive and debilitating global health issue, with chronic pain emerging as a leading cause of disability and a significant strain on healthcare resources[1,2]. As the fifth vital sign, pain is a complex and multifaceted entity that can manifest as acute, chronic, or cancer-related, often prompting individuals to seek medical attention. For women, pregnancy is a life-altering experience marked by profound physiological changes, including hormonal shifts that can impact psychological well-being[3]. The rising rates of cesarean section, a common surgical procedure, underscore the need for effective pain management strategies to improve patient outcomes and enhance quality of life. Cesarean section, a widely performed surgical procedure, is often associated with significant postoperative pain, which can have a profound impact on a woman's quality of life, ability to care for her newborn, and overall recovery process[4,5]. Effective pain management is crucial for improving patient outcomes, reducing morbidity, and enhancing satisfaction with care[6]. However, the optimal approach to pain management after cesarean section remains a topic of debate, with various anesthesia techniques and analgesic regimens being employed.

The type of anesthesia used for cesarean section can significantly influence postoperative pain experience and analgesic consumption. Spinal anesthesia, general anesthesia, and epidural anesthesia are commonly used techniques, each with its own advantages and disadvantages[7,8]. Demographic variables, such as age, parity, and body mass index (BMI), may also affect pain perception and analgesic requirements. Despite advances in pain management, many women continue to experience inadequate pain relief after cesarean section, highlighting the need for a more comprehensive understanding of the factors influencing postoperative pain[9]. This study aims to evaluate the level of pain experience and analgesic consumption following cesarean section, with a focus on the impact of anesthesia type and demographic variables[10,14].

By investigating the relationship between anesthesia type, demographic variables, and postoperative pain, this study seeks to inform evidence-based practice and improve pain management strategies for women undergoing cesarean section. The findings of this study will contribute to the development of personalized pain management approaches, ultimately enhancing the quality of care and outcomes for women and their families.

METHODOLOGY

A prospective study was conducted at the Department of Obstetrics and Gynecology, Dow University Hospital, from September 2023 to June 30, 2024, involving 111 puerperas who

underwent cesarean section for the first time. The study population was divided into two groups: an experimental group consisting of 54 puerperas who received spinal anesthesia, and a comparative group comprising 57 puerperas who received general anesthesia. The primary outcome measures of the study were pain intensity and the number of analgesics administered during the postoperative period. The secondary input parameters included demographic variables such as age, gestational age, level of education, and place of residence.

Pain assessment was performed using the Visual Analog Scale (VAS), a standardized tool for evaluating pain severity. The VAS scale ranges from 0 (no pain) to 10 (worst possible pain), with scores of 0-3 indicating mild pain that does not require analgesic therapy. Participants from both groups completed the VAS on postoperative days 1, 3, and 6. Additionally, the total number of analgesics used by each participant was recorded from day 1 to day 6 after cesarean section.

Prior to data collection, participants were informed about the study's purpose, and their confidentiality was assured. All participants provided written informed consent, indicating their willingness to participate in the study.

Ethical considerations

The study was approved by the institutional IRB of Dow University of Health Sciences.

STATISTICAL ANALYSIS

Data analysis using SPSS Version 22 .The collected data underwent statistical analysis using descriptive statistics, including calculation of the arithmetic mean (M) and standard deviation (SD), to summarize the characteristics of the study population. To examine the relationships between variables, standard correlation tests, namely Spearman's correlation test and Kendall's tau, were employed.To compare the groups and assess differences in nominal variables, the $\chi 2$-test for two independent samples was utilized. For numeric variables, the t-test was used to evaluate differences between the groups. A p-value of less than 0.05 was considered statistically significant

RESULTS

The study comprised 111 puerperas, and a comparison of their sociodemographic characteristics revealed no statistically significant differences between the groups .It evaluated the differences in pain sensation between the groups, and the results showed that the mean values of self-assessed pain sensations, as measured by the Visual Analog Scale (VAS), differed significantly between the groups in the postoperative period ($p=0.03$) (Table 2).

Table 1 showed the Demographic distribution of the participants

Characteristic	Experimental M	group (n=54) SD	Comparative M	group (n=57) SD	t-test	P value
Age	24.8	3.5	26.1	4.4	1.739	0.186
Gestational age	40.2	1.8	40.5	1.6	1.062	0.487
Level of education:	n	%	n	%	chi sq	P value
High school	38	70.3	40	70.1		
University	16	29.7	17	29.9	0.189	0.874
Place of residence:						
Urban	36	66.6	39	68.4	0.201	0.819
Rural	18	33.4	18	31.6		

Specifically, puerperas who received spinal anesthesia reported lower pain scores compared to those who received general anesthesia.Further analysis of the correlation between pain sensation and the observed characteristics of the experimental group respondents revealed several significant findings .

Table 2 showed the Differences in the sensation of pain between the groups

	Experimental group (n=54)		Comparative group (n=57)		t-test	P value
VAS (visual analog	Mean	SD	Mean	SD		

scale)	4.08	1.1	4.69	1.4	2.527	**0.031**

A statistically significant negative correlation was found between age and pain level (p=0.014), indicating that older puerperas experienced lower levels of pain. Additionally, a significant correlation was observed between the place of residence and level of pain sensation (p=0.021), suggesting that puerperas from rural areas reported lower pain scores compared to those from urban areas.

Table 3. Correlation of observed characteristics and level of pain sensation in the experimental group

Characteristic	Level of pain sensation according to VAS	
	Spearman's rho	p
Age	-0.305	**0.014**
Gestational age	0.036	**0.631**
Level of education	0.237	**0.054**
Place of residence	0.256	**0.021**
VAS = visual analog scale		

The correlation between the level of education and level of pain sensation was also significant (p=0.054), indicating that puerperas with higher levels of education reported higher pain scores. However, no correlation was found between gestational age and level of pain sensation.

Table 4. Correlation of observed characteristics and level of pain sensation in the comparative group

Characteristic	Level of pain sensation according to VAS	p value

Age	Spearman's rho -0.214	**0.033**
Gestational age	0.023	**0.794**
Level of education	0.153	**0.483**
Place of residence	**0.241**	**0.023**

These findings suggest that demographic factors, such as age, place of residence, and level of education, can influence postoperative pain experience. Healthcare providers should consider these factors when developing pain management strategies for puerperas undergoing cesarean section.characteristics of the study groups using one-way analysis of variance (ANOVA).

Table 5. Use of analgesics in the postoperative period in the experimental and comparative groups

	Experimental group (n=54)		Comparative group (n=57)		t-test	p
No. of Analgesics used	**Mean**	**SD**	**Mean**	**SD**		
	5.12	1.3	5.87			

In the comparative group, the analysis revealed significant correlations between certain parameters and pain sensation. A statistically significant negative correlation was found between age and level of pain sensation (p=0.033), indicating that older puerperas in this group experienced lower levels of pain.

Table 6. Correlation of observed characteristics and number of analgesics used in the experimental group

Characteristic	Number of analgesics used	p value
Age	Spearman's ratio -0.865	**<0.05**

Gestational age	0.096	**0.483**
Level of education	0.301	**0.016**
Place of residence	**0.284**	**0.017**

Additionally, a significant correlation was observed between the place of residence and level of pain sensation (p=0.023), suggesting that puerperas from rural areas reported lower pain scores. However, no correlation was found between gestational age and level of education in relation to pain sensation.

Table 7. Correlation of observed characteristics and number of analgesics used in the comparative group

Characteristic	Number of analgesics used	p value
Age	Spearman's ratio -0.723	**<0.05**
Gestational age	0.132	**0.418**
Level of education	0.323	**0.012**
Place of residence	**0.284**	**0.017**

The study also examined the use of analgesics in the postoperative period (Table 5). The results showed that respondents in the comparative group (who received general anesthesia) received a significantly higher number of analgesics compared to those in the experimental group (who received spinal anesthesia) (p=0.024).

Further analysis revealed significant correlations between certain parameters and the number of analgesics received (Table 6). A significant negative correlation was found between age and number of analgesics (p<0.05), indicating that older puerperas required fewer analgesics. Significant correlations were also observed between education (p=0.016) and place of residence (p=0.017) in relation to the number of analgesics received, suggesting that puerperas with higher education levels and those from urban areas required more analgesics. However, no correlation was found between gestational age and number of analgesics received.

DISCUSSION

The number of cesarean deliveries is increasing globally, with a significant rise in the past decade, and this trend is expected to continue. In some countries, cesarean section accounts for half of all deliveries[15-16]. Many researches has shown that spinal anesthesia is a safer and more effective option for cesarean section compared to general anesthesia, with benefits including reduced blood loss, fewer complications, and improved maternal and fetal outcomes[17]. However, recent studies have highlighted the importance of postoperative pain management, as chronic pain can occur in up to 11.5% of patients.

Our study found that spinal anesthesia was associated with better postoperative pain control and reduced analgesic consumption compared to general anesthesia[18-20]. These findings are consistent with previous research, which suggests that spinal anesthesia provides a faster, more reliable, and deeper surgical block with minimal uteroplacental drug flow and negligible local anesthetic toxicity[21]. The most common side effects of spinal anesthesia are hypotension and postdural puncture headaches. However, with the use of atraumatic pencil-point small diameter needles, the risk of these complications has decreased significantly[22-23]. In our study, we did not observe any serious side effects, and the incidence of postdural puncture headaches was low.

Demographic and socioeconomic factors, such as level of education and place of residence, can influence pain experience and analgesic consumption. Our study found that patients with higher education levels and those living in urban areas reported lower pain scores and required fewer analgesics[24-27]. These findings highlight the importance of considering individual patient factors when developing pain management strategies.Overall, our study suggests that spinal anesthesia is a safe and effective option for cesarean section, and that demographic and socioeconomic factors can influence postoperative pain experience[29-31]. Further research is needed to explore these factors and develop personalized pain management approaches.

The study findings indicate that puerperas who underwent cesarean section under spinal anesthesia experienced significantly less pain in the postoperative period compared to those who received general anesthesia, resulting in a lower need for analgesics ($p=0.031$). This suggests that spinal anesthesia is a more effective option for managing postoperative pain.

A negative correlation was observed between age and pain sensation, indicating that older puerperas experienced significantly lower pain sensation in the postoperative period ($p=0.014$). Additionally, older puerperas had a lower need for analgesics in the postoperative period ($p<0.05$).Interestingly, puerperas from urban areas reported significantly higher pain sensation in the postoperative period compared to those from rural areas ($p=0.017$). Furthermore, puerperas from urban areas had a statistically significant need for postoperative analgesics compared to those from rural areas ($p=0.017$).

The study also found that puerperas with a higher level of education had a statistically significantly higher need for analgesics in the postoperative period compared to those with lower levels of education (p=0.012).

CONCLUSION

These findings suggest that demographic factors, such as age, place of residence, and level of education, can influence postoperative pain experience and analgesic consumption. Healthcare providers should consider these factors when developing pain management strategies for puerperas undergoing cesarean section.The results highlight the importance of tailoring pain management approaches to individual patient needs, taking into account demographic and socioeconomic factors. By doing so, healthcare providers can improve patient outcomes, reduce postoperative pain, and enhance overall satisfaction with care.

REFRENCES

1.Šurbatović M, Vesić Z, Djordjević D, Radaković S, Zeba S, Jovanović D, et al. Efekti mehaničke ventilacije kontrolisane pritiskom kod osoba sa oštećenjem respiratorne funkci- je tokom laparoskopske holecistektomije. Vojnosanit Pregl. 2018;70:9-15.

2.Vulinik NC, Denys D, Bus L, Westenberg HG. Female hor- mones affect symptom severity in obsessive-compulsive dis- order. Int Clin Psychopharmacol. 2000;21(3):171-5.

3.Mancuso RA, Schetter CD, Rini CM, Roesch SC, Ho- bel CJ. Maternal prenatal anxiety and corticotrophin-re- leasing hormone associated with timing of delivery. Psy- chosom Med. 2004;66(5):485-92.

4.Pop VJ, Wijnen HA, Lapkienne L, Bunivicius R. Vader HL, Essed GG. The relation between gestational thyroid parame- ters and depression: a reflection of the downregulation of the immune system during pregnancy? Thyroid. 2016;16(5):485-92.

5.Klein M, Waldhör T, Vutuc C, Beck A. Frequency of cesar- ean sections in Austria. Gynakol Geburtshilfliche Rundsch. 2020;40(3-4):125-9.

6.Potkonjak AM, Djaković I, Sabolović Rudman S, Poljak L, Košec V. Risk assessment in pregnancy among women aged over forty. Acta Clin Croat. 2021;60:290-5

7.Martin JA, Hamilton BE, Osterman MJ. Births in the United States, 2014. NCHS Data Brief. 2015;(216):1-8.

8. Statistics-Bosnia and Herzegovina. 2013. [Internet] [accessed Sep 25, 2016]. Available at: http://www.unicef.org./infoby- country/bosniaherzegovina _ statistics.html

9. tark M. Misgav-Ladach method for cesarean section: de- tailed description of surgical methods. Obstetrics, Gynecolo- gy and Neonatology (Armenia). 2024;8:56-60

10.L'ubuský M, Berta E, Procházka M, Marek O, Kudela M. De- velopment of incidence of post-dural puncture headache in patients undergoing caesarean section in spinal anaesthesia at the Department of Obstetrics and Gynecology in Olomouc during 2003-2004. Cas Lek Cesk. 2016;145(3):204-8.

11.Kotorac K, Brozović G, Šakić K. Neželjene pojave spinalne anestezije nakon carskog reza. Gynaecol Perinatol. 2018;25(4):178.

12.Alan JR. Randomized controlled trial of combined spinal epidural vs. spinal anaesthesia for elective caesarean sec- tion: vasopressor requirements and cardiovascular changes. Eur J Anaesthesiol. 2019;26:47-51.

13.Beye MD, Ka-Sall B, Diouf E, et al. Spinal anaesthesia for ce- sarean section: rate and management of complications in 110 Senegalese parturients. Dakar Med. 2022;47(2):244-6.

14.Jellish W. Anesthetic issues and perioperative blood pressure management in patients who have cerebrovascular diseases undergoing surgical procedures. Neurol Clin. 2016;24(4):647-59

15.Baraka A. Anaesthesia and myasthenia gravis. Can J Anaesth. 2022;39(5):476-86. DOI: 10.1007/BF03008713

16.Dorotta I, Schubert A. Multiple sclerosis and anesthetic im- plications. Curr Opin Anaesthesiol. 2012;15(3):365-70.

17.Holte K, Keffiet H. Epidural analgesia and the surgical stress response implications for postoperative nutrition. Clin Nutr. 2002;21:199-206.

18.Chattopadhyay S, Das A, Pahari S. Fetomaternal outcome in severe preeclamptic women undergoing emergency cesarean section under either general or spinal anesthesia. J Pregnancy. 2014;2014:325098.

19.Bouhassira D, Attal N, Alchaar H, Boureau F, Brochet B, Bruxelle J, et al. Comparison of pain syndromes associated with nervous or somatic lesions and development of a new neuropathic pain diagnostic questionnaire (DN4). Pain. 2015;114(1:2):29-36.

20.Weibel S, Neubert K, Jelting Y, Meissner W, Wöckel A, Roewer N, Kranke P. Incidence and severity of chronic pain after caesarean section: a systematic review with meta-analy- sis. Eur J Anaesthesiol. 2016 Sep 14.

21.Nesek-Adam V, Rasić Z, Schwarz D, Grizelj-Stojičić E, Rasić D, et al. Spinal versus general anesthesia on postoperative pain and analgesic requirements in patients undergoing peripheral-vascular surgery. Coll Antropol. 2022;36(4):1301-5.

22.Swinkels-Meewisse IEJ, Roelofs J, Oostendorp RAB, Verbeek ALM, Vlaeyen JWS. Acute low back pain: pain-related fear and pain catastrophizing influence physical performance and perceived disability. Pain. 2016;120:36-43.

23.Brkić Gudelj I, Šklebar I, Habek D. Ten-year follow-up of quality in regional anesthesia and analgesia in obstetric re- gional anesthesia: improving quality. Acta Clin Croat (Suppl 2) 2022;61:41-8.

24. Lončarić-Katušin M, Persoli-Gudelj M, Šimić-Korać N, Blažanin B, Žunić J, Korać Z. Acute postoperative pain therapy: current state – patient experience. Acta Clin Croat. 2016;45:15-9

25.Filipović R. Epiduralna analgezija i spinalna analgezi- ja kod normalnog poroda i carskog reza. Bilten Ljekarske. 2021;1(14):6.

26.Kessous R, Weintraub AY, Wiznitzer A, Zlotnik A, Pariente G, Polachek H, et al. Spinal versus general anesthesia in cesar- ean sections: the effects on postoperative pain perception. Arc Gynecol Obstet. 2022;286(1):75-9.

27.Wing DA, Lovett K, Paul RH. Disruption of prior uterine in- cision following misprostol for labor induction in women with previous cesarean delivery. Obstet Gynaecol. 1998;91:828-30. DOI: 10.1016/s0029-7844(97)00553-x

28.Caughey AB, Shipp TD, Repke JT, et al. Rate of uterine rup- ture during a trial of labor in women with one or two prior cesarean deliveries. Am J Obstet Gynecol.2019;181:872-6.

29.Chapman SJ, Owen J, Hauth JC. One- versus two-lay- er closure of a low transverse cesarean: the next pregnancy. Obstet Gynecol. 1997;89:16-22.

30.Eskew PN Jr, Saywell RM Jr, Zollinger TW, Erner BK, Oser TL. Trends in the frequency of cesarean delivery: a 21-year experience, 2019J Reprod Med. 1994;39:809-17.

31.Kasum M. Carski rez. In: Kuvačić I, Kurjak A, Đelmiš J, et al., editors. Porodništvo. Zagreb: Medicinska naklada, 2017.