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Research Article/Özgün Araştırma

Comparison of anesthesia results in Turkish and immigrant patients who underwent cesarean section

Sezaryen yapılan Türk ve göçmen hastalarda anestezi sonuçlarının karşılaştırılması

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Abstract

Aim: Our study aims to compare anesthesia complications between immigrant and Turkish patients thus better knowledge to clinicians and anesthetists for the management of cesarean operative delivery among different race obstetric populations.

Materials and Methods: Between 06.2018-08.2018, cesarean anesthesia forms were examined retrospectively. Age, gestational week, indication of surgery, anesthesia method applied, complications in mother (hypotension, bradycardia, bleeding, emesis) recorded.

Results: 143 Turkish and 145 immigrant patients were recruited for our study. ASA II score, emergency cesarean (CS) rate, emesis incidence, hypotension rate of patients were statistically higher in immigrant patients than in Turkish patients (p<0.05). There was statically no significant difference found between the two groups of patients on behalf of bradycardia.

Conclusion: We highlight the barriers to emergency cesarean section operations in the un-monitored obstetric population, so it is vital to raise awareness of both obstetricians and anesthesiologists on this issue.

Keywords: Cesarean; Anesthesia; Immigrant.

Öz

Amaç: Çalışmamız göçmen ve Türk hastalar arasındaki anestezi komplikasyonlarını karşılaştırmayı, böylece klinisyenlere ve anestezistlere farklı ırktan obstetrik popülasyonlarda sezaryenle operatif doğum yönetimi konusunda daha fazla bilgi vermeyi amaçlamaktadır.

Gereç ve Yöntem: 06.2018-08.2018 tarihleri arasında sezaryen anestezi formları retrospektif olarak incelenerek çalışma gerçekleştrildi. Yaş, gebelik haftası, ameliyat endikasyonu, uygulanan anestezi yöntemi, annedeki komplikasyonlar (hipotansiyon, bradikardi, kanama, kusma) kaydedildi.

Bulgular: Çalışmamıza 143 Türk ve 145 göçmen hasta alındı. Göçmen hastalarda hastaların ASA II skoru, acil sezaryen (CS) oranı, kusma, hipotansiyon insidansı, Türk hastalara göre istatistiksel olarak daha yüksekti (p<0,05). İki hasta grubu arasında bradikardi adına istatistiksel olarak anlamlı fark bulunmadı.

Sonuç: Takipsiz obstetrik popülasyonda acil sezaryen operasyonlarının önündeki engelleri vurguluyoruz, bu nedenle hem kadın doğum uzmanlarının hem de anestezistlerin bu konudaki farkındalığının artırılması hayati önem taşıyor.

Anahtar Kelimeler: Sezeryan; Anestezi; Göçmen.

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intihal incelemesinden geçirilmiştir.

Introduction

Cesarean birth frequency continues to increase worldwide[1]. Although cesarean section (CS) has become very reliable over the years, is still accompanied by poor perinatal and maternal outcomes compared to vaginal delivery[2]. The overall CS-associated postoperative surgery and anesthesia-related morbidity rate is 35.7%[3].

Although general anesthesia for CS has many advantages, such as cardiovascular stability, better and good control over ventilation, lower incidence of hypotension than regional anesthesia and faster induction in case of emergency; anesthetic drugs that are used during CS, can cross the placental barrier may affect neonatal wellbeing by respiratory depression[4]. It has been reported that during general anesthesia, complications such as difficult intubation, intubation failure, and aspiration of gastric contents may contribute to maternal mortality[5,6].

In spinal anesthesia main disadvantage is maternal hypotension; as it may cause vomiting and nausea in pregnancy and is the main cause of emesis during regional anesthesia and may result in a decreased level of consciousness and vertigo, which occurs less often when the drop in blood pressure is immediately treated[7], fetal acidosis may develop which may lead to fetal bradycardia and cardiovascular collapse in severe cases by a decrease in the uteroplacental blood flow (available at: https://www.nysora.com). It has been hypothesized that along with severity, the duration of hypotension is a major risk factor in maternal and fetal well-being.

An abundant body of research demonstrates that language and cultural barriers negatively affect care for the estimated 9% of the population or more than 21 million people who have limited language proficiency resulting in reduced access, higher hospitalization rates, lack of knowledge about doctors, increased risk of permanent damage, and limited health knowledge from communication difficulties[8]. Although treatment costs were not frequently considered as barriers, access to outpatient clinics remains a major issue with low utilization of hospital services, with daycare treatment.

Our study aims to compare anesthesia complications between immigrant and Turkish patients thus better knowledge to clinicians and anesthetists for the management of cesarean operative delivery among different race obstetric populations. The secondary aim was a better understanding of anesthesia complications in low-income, unmonitored obstetric populations since compared to Turkish patients, immigrant obstetric patients do not have scheduled visits to the hospital periodically throughout their pregnancy.

Materials and Methods

Between 01.06.2018-31.08.2018, the anesthesia forms of pregnant women who underwent cesarean section in Istanbul Training and Research Hospital were examined retrospectively after the approval of the Local Human Ethical Commitee (07.02.2020-2170). Name, age, gestational week, indication of surgery, whether emergency or elective, anesthesia method applied. Complications in the mother (hypotension, bradycardia, bleeding, emesis) were recorded.

Inclusion criteria: Pregnant women between 18-45 years old, American Society of Anesthesiologists (ASA) scores I, II patients, patients who received general and spinal anesthesia

Exclusion criteria: patients with known psychiatric illness, a history of taking any antidepressant or antianxiety drugs and having absolute or relative contraindication for either regional or general anesthesia.

In our study 166 Turkish and 153 immigrant patients were included. 21 out of 166 Turkish patients who were emergency and not under our department's provision were excluded. 10 out of 153 immigrant patients who had scheduled visits to our department were excluded. All the patients had intravenous access. Standard monitoring was performed routinely (electrocardiogram monitoring, noninvasive peripheral oxygen saturation, and arterial blood pressure follow-up). 6–8 hour of fasting was expected before all elective CS

patients. As recommended by the American College of Obstetricians and Gynecologists guidelines antibiotic prophylaxis is administered within 1 hour of surgery[9]. Pre-operative hemoglobin and hematocrit values were determined within 1 month in elective CS vs immediately after hospitalization in the emergency CS group of patients.

Indication of general anesthesia over spinal anesthesia includes; immediate threat to the life of the pregnant woman or fetus (placental abruption, umbilical cord prolapse, acute and massive bleeding from placenta previa)

Before the operation, only in elective CS group of patients had a crystalloid solution, for 20 minutes at the rate of 15 ml/kg rapidly before the operation. Afterward, in the sitting position 25-gauge needle from the L3-4 or L4-5 subarachnoid space entered after proper skin cleansing.

0.5% hyperbaric bupivacaine (2.2 ml) was administered into the intervertebral space after observation of cerebral spinal fluid (CSF) flow. Patients were lateralized for 5-10 minutes in a fully supine position with their heads elevated to 30 degrees, for proper positioning.

Bromage scale was used for the determination of motor block level, while the hot/cold test, as a dermatome level, was used for the sensory block level. The operation started after the T4-T5 level sensory block level reached sufficient. When required midazolam is used for sedation for patients after the delivery of the newborn. In both Turkish and immigrant patients, when hypotension occurred following the anesthesia (mean arterial blood pressure falling below 60 mmHg of baseline), ephedrine hydrochloride (10 mg; IV) was administered if hypotension continued. In case of continuation additional 10 mg ephedrine hydrochloride is added to the regimen until the patient stabilizes. In addition to ephedrine a rapid crystalloid infusion was given to all hypotensive patients.

Bradycardia was defined as a falling of heart rate below 50 beats per minute during anesthesia. For patients who developed bradycardia, the issue was resolved by the administration of IV atropine sulfate (0.5 mg).

The study was carried out in consonance with the Declaration of Helsinki. The Ethics Committee approved our study protocol of Istanbul Training and Research Hospital (file number: 2170, date: 07.02.2020). As our study is retrospective, we could not get the informed consent of patients.

Type of the study

The study was planned as a descriptive retrospective study.

The sample size of the study

A total of 288 patients were included to the study that performed between 01.06.2018-31.08.2018.

Data collection tools

All the files of patients' who undergone cesarean section in Istanbul Training and Research Hospital 01.06.2018-31.08.2018 were examined.

Data analysis

IBM SPSS Statistics 25.0 for Mac (SPSS, Chicago, IL, USA) was used for performing statistical analyses. Descriptive statistics were stated as standard deviation, frequency, mean and percentage. Continuous numeric variables and categorical variables like ASA score, hypotension, emesis, bradycardia and emergency or elective c-section rates between Turkish and immigrant patients were performed by using Student's t-test (because of random sampling and seen from the histogram of each of the two groups) and the chi-square test statistical analyses performed. Statistical significance was defined as $p< 0.05$.

Ethics Committee Approval

Ethics committee approval was obtained with the decision of the Ethics Committee for Non-Interventional Procedures of Istanbul Training and Research Hospital, dated 07.02.2020, and numbered 2170. The principles of the Declaration of Helsinki conducted the research.

Results

143 Turkish and 145 immigrant patients were recruited for our study.

Cesarean indications among 143 Turkish patients and 145 immigrant patients were listed in Table 1. In both groups, the main CS delivery indication was previous CS operation followed by cephalopelvic disproportion and fetal compromise.

Table 1. Cesarean delivery indications in Turkish and immigrant patients.

	Turkish patients n=143	Immigrant patients n=145
Breech presentation	9	11
Cephalopelvic disproportion	17	16
Fetal compromise	18	16
Multiple gestation	5	6
Previous CS	82	71
Cord prolapsus	1	
Preeclampsia	11	11
Ablatio placenta		5
Premature rupture of membranes		4
Fetal macrosomia		1
Fetal transverse lie		1
Placenta previa		3

CS: Cesarean section

As shown in Table 2, 143 Turkish and 145 immigrant patients were recruited for our study. The mean age of Turkish and immigrant patients was 28.8 and 26.1 years old respectively. Preoperative hematocrit (Hct) values of Turkish and immigrant patients were 33.8 and 33.4 g/dl respectively There was no statistical difference between the patient's age and pre-operative hematocrit values (p>0.2). ASA II score and emergency CS rate of patients were statistically higher in immigrant patients than in Turkish patients (p<0.05). ASA I score and elective CS rate of patients were statistically higher in Turkish patients than in immigrant patients (p<0.05). 11 out of 143 Turkish patients had general anesthesia versus 18 out of 145 immigrant patients. There was no statistically significant difference between the two groups of patients. (p=0.18).

Table 2. Operative data of patients.

	Turkish patients	Immigrant patients	*p*-value*
Number of patients (n)	143	145	
Age (years)	28.8 ± 6.01	26.1 ± 6.44	0.2*
Pre-operative Hct (g/dl)	33.8 ± 3.13	33.4 ± 3.39	0.16*
ASA I (n)	26	6	0.0001**
ASA II (n)	117	139	0.0001**
General Anesthesia (n)	11	18	0.18**
Regional Anesthesia (n)	132	127	0.18**
Emergency CS (n)	66 ±	122	0.0001**
Elective CS (n)	77 ±	23	0.0001**

*: Student T test; **Chi-square test; Hct: Hematocrit; ASA: American Society of Anesthesiologists; CS: Cesarean section

In all patients, the incidence of emesis was not related with the age of patients. 163 patients had emesis and the mean age of patients were 27.2 years old versus 125 patients with no emesis, the mean ages of patients was 27.5 years old (p=0.35).

When analyzing all 288 patients, 60 out of 184 emergency CS patients versus 33 out of 96 patients in elective CS had bradycardia CS (p=0.04). Emergency CS patients had a statistically higher bradycardia rate than elective CS.

When analyzing all 288 patients, 11 out of 32 ASA I patients versus 81out of 246 ASA II patients had bradycardia (p=0.98). There was no statistically significant difference found in ASA I and ASA II patients on behalf of bradycardia.

Sixty-five out of 143 patients had emesis in Turkish patients versus 98 out of 145 patients in immigrant patients. There was a statically significantly higher emesis rate in immigrant patients than Turkish patients (p<0.05).

Ninety-one out of 143 patients had hypotension in the Turkish group versus 108 out of 145 patients in immigrant patients. There was a statically significant difference between immigrant and Turkish patients on behalf of hypotension (p=0.046).

Fifty-three out of 143 patients had bradycardia in the Turkish group versus 40 out of 145 patients in immigrant patients. There

was statically no significant difference between immigrant and Turkish patients on behalf of bradycardia (p=0.091)

Discussion

In both Turkish and immigrant patients, the indications of cesarean delivery remain similar (Table 1). Although guidelines for anesthesia recommend regional anesthesia for a cesarean section because of the higher risk of intraoperative blood loss, aspiration, failed intubation, and awareness of non-regional anesthesia, maternal request for general anesthesia is still high. In our study, although not reaching the level of statistical significance, the general anesthesia ratio was higher in immigrant patients than in Turkish patients (Table 2). Thus, for avoiding both fetal and maternal complications, the preferred anesthetic technique has now regional anesthesia as recent rates of CS using general anesthesia decreasing[10,11]. As for obstetric reasons, immigrant patients have more likely to have emergency operations thus complications of general anesthesia are more likely to occur.

One of the most important etiological factors for intraoperative nausea and vomiting is hypotension occurring during regional anesthesia. We found a higher incidence of emesis in immigrant patients (Figure 1) since the rate of emergency surgery and hypotension (Figure 2) were significantly higher in immigrant patients (Table 2), which may cause full stomach and inadequate fasting time that aggregates nausea and vomiting. In a recent study, intra-operative nausea was observed less frequently with advanced maternal age, which they attributed to decreased estrogen levels[12], we could not examine this correlation in our study, since both emesis and no emesis patients groups had similar age distribution.

In a study by Balki et al.[13] optimizing the use of i.v. and neuraxial opioids, cautious administration of uterotonic agents, minimizing surgical stimulus, improving the quality of block, and controlling hypotension, emesis can be prevented despite that prophylactic antiemetic usage during cesarean sections advocated by some clinicians. Thus in our clinic, we do not use prophylactic antiemetics. We reserved antiemetics (metoclopramide 20 mg) for the treatment of vomiting and nausea not responding to routine approaches.

Maternal hypotension is common with labor epidural anesthesia procedures, complicating 5-17% of cases[14]. If maternal hypotension is uncorrected during regional anesthesia, decreased uteroplacental perfusion can cause during labor bleeding complication[15]. During spinal anesthesia, there are a certain number of proven risk factors for the development of hypotension. We found hypotension was statistically significantly higher in immigrant patients (Figure 2). One of the reasons for this situation was the high rates of emergency CS rate in immigrant patients. Lack of receiving standard 1000-mL crystalloid intravenous fluid bolus immediately before the operation to achieve adequate volume preloading before regional anesthesia placement in immigrant patients with no proper appointment for CS may cause the problem.

Sun and Huang conclude that hypotension after regional anesthesia is affected by effective circulating blood volume and preoperative sympathetic activity[16]. Since Turkish and immigrant patient groups had the same mean Hct values, we conclude that sympathetic activity is more effective in the etiopathogenesis of maternal hypotension.

It is important to be able to discover and predict maternal hypotension during CS, highlighted by Olang et al. who conclude that the impact of maternal hypotension that occurred less than two minutes, affects the incidence of neonatal acidemia and five-minute Apgar scores of neonates minimally[17].

Pereira et al. found in their study that factors associated with hypotension were age, type of anesthesia, and patient gender[18]. When compared to patients younger than 41 years of age, the probability of an individual developing hypotension was found 1.51 times higher at ages between 41 and 60 years and 2.80 times higher in the age group >61 years. As shown in Table 2, even though the immigrant patients' ages were slightly lower

than Turkish patients, there was no statistically significant difference between the groups.

Contrary to our results (higher ASA II and equal rate of bradycardia in immigrant patients) (Figure 3), Pereira et al. found in their study that, the probability of developing sinus bradycardia was greater in ASA I patients compared to higher ASA score (ASA II, III, and IV) patients, they conclude that, these findings most likely because, in younger patients, vagal tonus is more pronounced[18]. They found in their study that, emergency or urgent CS patients had a less frequent bradycardia rate than routine anesthesia patients. These data differ from those reported in the literature, as well from our study, as we found a higher rate of bradycardia in the emergency CS group, we conclude that sinus bradycardia is more frequent in patients undergoing urgent and emergency CS anesthesia that might have pre-existent, inadequately treated or non-diagnosed underlying diseases.

As we mentioned above communication issues are the major problem in immigrant pregnancies. Karaca et al. attribute this issue with them not to benefit effectively benefit from the healthcare system.[19] This problem is not only for immigrants but also for health professionals. In their study, the immigrant patient who underwent emergency cesarean section is 596 (12.2%). Failure to communicate is one of the relative contraindications of spinal anesthesia. Since an interpreter is available 24 hours a day in goverment hospitals there was less difficulty in communicating with patients. Again, spinalwas the most commonly performed anesthesia method in these patients.

It was independent of the presence of any known risk factors or usual clinical indications, suggesting that cultural background influences the mode of delivery and/or anesthesia overcoming the expected standard of care and outcomes in public health services.

In immigrant patients with inadequate preparation for CS, major complications in cesarean anesthesia such as hypotension, emesis, and/or bradycardia, arise; the ASA score and age of patients have either no or little value since the obstetric population is relatively young age. Thus, training, tools, and resources to support potential referrers in detecting to help increase the proportion of referrals to obstetric & gynecology clinics might help in managing those patients.

Conclusion

In our study, we highlight obstacles associated with emergency CS operations since the number of immigrant pregnancies is equal if not higher than Turkish pregnancies in our country thus it is vital to increase the awareness of both obstetricians and anesthetists on this issue.

Ethics Committee Approval

Ethics committee approval was obtained with the decision of the Ethics Committee for Non-Interventional Procedures of Istanbul Training and Research Hospital, dated 07.02.2020, and numbered 2170. The principles of the Declaration of Helsinki conducted the research.

Informed Consent

Data concerning the study were collected with the permission of the Istanbul Training and Research Hospital.

Author Contribution

All of the authors contributed at every stage of the study

Conflict of Interests

There is no conflict of interest to declare.

Financial Disclosure

No person/organization is supporting this study financially.

Statements

These research results have yet to be presented anywhere previously. Data related to the study is available on request.

Peer-review

Externally peer-reviewed.

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