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ORIGINAL ARTICLE

# Evaluation of satisfaction with general and spinal anesthesia in cesarean section surgery

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**Abstract**

**Objective:** We aimed to investigate the satisfaction of pregnant women scheduled for caesarean section with the anesthesia method applied after being informed about their preferred anesthesia method.

**Methods:** This study was conducted on patients who applied to the anesthesia outpatient clinic of our hospital in June-July-August 2023. A questionnaire was administered to the patients to inquire about their preoperative knowledge and fears about general and spinal anesthesia, and postoperative satisfaction with the type of anesthesia they preferred.

**Results:** Of the patients who underwent elective caesarean section,94.1% underwent regional anesthesia and 5.8% under general anesthesia.When the groups were evaluated in terms of anesthesia experience, there was a statistically significant difference between the groups($p=0.011$). The general anesthesia experience was significantly lower in the SS group compared to the GS and GG groups($p<0.05$).In addition, the experience of spinal anesthesia in the GS group was lower than the other groups and this difference was significantly different from the SS group($p<0.05$). A significant difference was found between the groups when the parameter of the method that the patients would prefer in case of reoperation was analysed($p<0.001$). When the groups were compared for subgroup analysis, "Spinal anesthesia preference" was statistically significantly higher in the SS and GS groups than in the GG group($p<0.05$). According to their new preferences after the information,92.3% of the SS group,77.8% of the GS group and 100% of the GG group stated that they were satisfied with the application.

**Conclusion:** Lack of information and having wrong information due to negative sensations from the environment cause patients to prefer general anesthesia. We think that if pregnant women are given good information in the preoperative period, their preference for spinal anesthesia, which is safer for themselves and their babies, in cesarean section surgeries and their satisfaction as a result of these preferences will increase.

**Keywords:** General anesthesia; spinal anesthesia; cesarean; satisfaction; postspinal headache

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## Introduction

Cesarean section is the most common obstetric surgical operation in Turkey as in the whole world. Cesarean section rates and rates in Turkey are increasing year by year. According to the Ministry of Health Statistics Yearbook 2021 data, 60% of all births in Turkey were performed by cesarean section [1].

In recent years, with the increase in the rate of cesarean section, there have been changes in the anesthesia method applied. Unlike other surgeries, in cesarean section surgeries, the anesthetist should choose the anesthesia method that is safest and comfortable for the mother, least depressant for the newborn and provides suitable working conditions for the surgeon by considering the physiological and anatomical changes that develop in the mother due to pregnancy and evaluating the factors that will affect the adaptation process of the mother in the postoperative period [2,3]. As defined in the American Society of Anesthesiologists (ASA) Guidelines for Obstetric Anesthesia, the choice of anesthesia technique for cesarean section should be based on anesthesia, maternal and fetal risk factors, the desire of the pregnant woman and the preference of the anesthetist [4]. In cesarean section anesthesia, both general and regional anesthesia can be preferred. Although regional anesthesia has been the most preferred method by both surgeons and anesthetists in recent years, especially in obstetric anesthesia, many patients in Turkey still prefer general anesthesia due to fear of regional blocks [5]. In order to increase the preference for regional anesthesia, adequate information should be provided preoperatively. In order for the patient to choose the appropriate method more easily, the anesthetist should definitely explain the anesthetic strategies to be applied and the advantages and disadvantages in detail [6]. Good preoperative information by the anesthetist is directly related to reducing preoperative fears and increasing satisfaction with the chosen anesthesia method intraoperatively and postoperatively.

In this study, we aimed to investigate the anesthesia method preferred by pregnant women undergoing cesarean section, their fears about the methods they preferred, whether their preferences changed after information and their satisfaction with the anesthesia method they preferred after surgery.

## Materials and Methods

This study was performed on patients who applied to the anesthesia outpatient clinic of our hospital in June-July-August 2023 after obtaining the permission of the Clinical Research Ethics Committee of Giresun Training and Research Hospital (no:20.11.2023/02). A questionnaire was administered to the patients in order to question their level of knowledge and fears about general and spinal anesthesia preoperatively and the degree of satisfaction with the type of anesthesia they preferred in the postoperative period.

The patients who came to the outpatient clinic were informed about the study and verbal and written informed consent was obtained from the patients who agreed to participate in the survey. The survey questions were asked by the anesthesia doctor and the answers obtained from the pregnant women were recorded by the same doctor. Pregnant women were informed that if there was a question they did not want to answer, that question would be skipped and they could terminate the questionnaire at any time. Pregnant women who were over 37 weeks of gestation and who were admitted to the anesthesia outpatient clinic in the preoperative period with the decision of cesarean section under elective conditions were included in the survey. Pregnant women who were taken urgently in this 3-month period, pregnant women who had communication problems even if they applied to the outpatient clinic electively, or pregnant women who were mentally unable to answer the questions were excluded from the study.

The first part of the questionnaire included the age and education level of the patients, their previous anesthesia experience, their anesthesia preference and whether they had information about this preference, the reasons for their preference for general or regional anesthesia and their fears. In the second part, after detailed information about anesthesia methods by the anesthesiologist, anesthesia method preferences were questioned.In the second part, their preferences were questioned after detailed information about anesthesia methods by the anesthesiologist. In the last part, the satisfaction of the patients with their postoperative anesthesia preferences (general and regional), their negative experiences, if any, and which method they would prefer if they were operated again were

questioned. The first two parts of the questionnaire were completed by one-to-one interview in the preoperative outpatient clinic room, and the last part of the questionnaire was completed by calling the patient by telephone in the first postoperative week. The results were recorded as 'yes/no'.

No guidance was given to the patients during the questioning. It was made clear to the patients that their preferred anesthesia method would be used unless there was a medical obstacle, such as upper respiratory tract infection, systemic disease or abnormal bleeding profile, but if there was a medical obstacle, the anesthesia method that was best for them and the baby would be chosen.

**Statistical analysis**

IBM-Statistical Package for Social Sciences (IBM-SPSS Inc., Chicago, IL, USA) 22.0 programme was used to analyse the data obtained in the study. The conformity of the data to normal distribution was analysed by "Kolmogorov Smirnov test". Continuous variables were expressed as mean ± standard deviation and categorical variables were expressed as number and percentage. 'One-Way ANOVA test' was applied in the analysis of continuous variables. Chi-square test or Fisher's exact test was used to analyse categorical variables. Statistical significance level was accepted as $p<0.05$.

**Results**

A total of 398 cesarean section operations were performed in the operating theatre of Giresun Gynaecology and Paediatrics Training and Research Hospital in June-July and August 2023. Of these patients, 105 of whom were decided to have a cesarean section under elective conditions, applied to the anesthesia clinic for preoperative evaluation. 3 patients were excluded from the study because they did not want to participate in the survey. A total of 102 patients were administered the study questionnaire.

Pregnant women were divided into groups according to the method they preferred and whether there was a change in their preference after the information. The group who preferred spinal anesthesia and whose preference did not change was named as SS, the group who preferred general anesthesia and whose preference changed towards spinal anesthesia after information was given was named as GS, and the group who preferred general anesthesia and whose preference did not change was named as GG. Pregnant women who preferred spinal anesthesia did not change their preference after information. The SS group consisted of 78 patients, the GS group consisted of 18 patients and the GG group consisted of 6 patients. During this period, 94.1% of the patients who underwent elective cesarean section were operated with regional anesthesia and 5.8% with general anesthesia.

Patients were evaluated according to age groups, educational status, experience of anesthesia in previous delivery, preferred anesthesia method and whether they had information about this method. There was no statistically significant difference between the age and education levels of the patients. When the groups were evaluated in terms of anesthesia experience, there was a statistically significant difference between the groups ($p=0.011$). When the anesthesia experience parameter was compared in subgroups, the general anesthesia experience was statistically significantly lower in the SS group compared to the GS and GG groups ($p<0.05$). In addition, the experience of spinal anesthesia in the GS group was lower than the other groups and this difference was statistically significantly different from the SS group ($p<0.05$) (Table 1). The number of patients who had no information about their preferred method was 13 in the SS group, 6 in the GS group and 2 in the GG group. The sources of information are given in detail in Table 1. In all groups, the source of information was mostly previous anesthesia experiences. The second most common source of information was the information obtained from gynaecologists.

The reasons of the patients who preferred spinal anesthesia are shown in Table 2. Among the patients who could select more than one option, 98.7% stated that they preferred spinal anesthesia because of the negative experiences they had heard about general anesthesia. The most common fear was that the anesthesia might be too much. The reasons of the patients who preferred general anesthesia are shown in Table 3. Again, in patients who could tick more than one option, the highest reasons for preference in both GS and GG groups were negative experiences from the environment, fear of paralysis and fear of postoperative headache.

**Table 1.** Demographic characteristics

| | | SS, (n=78) | GS, (n=18) | GG, (n=6) | p value |
|---|---|---|---|---|---|
| Age | | 30.22±4.45 | 31.06±5.16 | 29.67±5.28 | 0.837 |
| Education level | Primary School | 3(3.8%) | 3(16.7%) | 0(0%) | 0.084 |
| | Middle School | 13(16.7%) | 7(38.9%) | 1(16.7%) | |
| | High School | 28(35.9%) | 3(16.7%) | 3(50%) | |
| | University | 34(43.6%) | 5(27.8%) | 2(33.3%) | |
| Anesthesia experience | None | 13(16.7%)[a] | 3(16.7%)[a] | 1(16.7%)[a] | **0.011** |
| | General | 6(7.7%)[a] | 7(38.9%)[b] | 2(33.3%)[b] | |
| | Spinal | 56(71.8%)[a] | 6(33.3%)[b] | 3(50%)[a,b] | |
| | General+Spinal | 3(3.8%)[a] | 2(11.1%)[a] | 0(0%)[a] | |
| Information on anesthesia method | No information | 13(16.7%) | 6(33.3%) | 2(33.3%) | 0.707 |
| | Due to my previous anesthesia experience | 49(62.8%) | 9(50%) | 3(50%) | |
| | With the advice of my gynaecologist | 11(14.1%) | 1(5.6%) | 1(16.7%) | |
| | With experience recommendation from family or friends | 4(5.1%) | 2(11.1%) | 0(0%) | |
| | TV/internet research | 1(1.3%) | 0(0%) | 0(0%) | |

Variables were expressed as mean ± standard deviation or n (%). One-Way ANOVA test or Chi-square test was applied. Each identical superscript (a, b) indicates a subset of group categories that are not statistically significantly different from each other at the p: 0.05 level.

**Table 2.** Reasons for spinal anesthesia preference

| | SS, (n=78) |
|---|---|
| Due to previous experience | 39(50%) |
| Because of what I have heard about general anesthesia | 77(98.7%) |
| Fear of not waking up from general anesthesia | 64(82.1%) |
| Fear of too much anesthesia | 75(96.2%) |
| The desire to see your baby immediately when it is born | 54(69.2%) |
| The desire to be myself and be able to breastfeed your baby earlier | 69(88.5%) |
| With the advice of the gynaecologist | 70(89.7%) |
| Not wanting to suffer pain | 73(93.6%) |

Variables were expressed as n (%).

**Table 3.** Reasons for general anesthesia preference

| | GS, (n=18) | GG, (n=6) |
|---|---|---|
| Due to previous anesthesia experience | 8(44.4%) | 3(50%) |
| Because of the negative experiences I have heard from the environment about spinal anesthesia | 17(94.4%) | 6(100%) |
| Fear of paralysis after spinal anesthesia | 15(83.3%) | 6(100%) |
| Fear of headache after spinal anesthesia | 17(94.4%) | 6(100%) |
| With the recommendation of the gynaecologist | 16(88.9%) | 6(100%) |
| Due to unwillingness to suffer pain | 14(77.8%) | 5(83.3%) |
| For the reason that I don't want to see anything | 14(77.8%) | 4(66.7%) |

Variables were expressed as n (%).

**Table 4.** Postoperative period

| | | SS, (n=78) | GS, (n=18) | GG, (n=6) | p value |
|---|---|---|---|---|---|
| Negative effect | None | 72(92.3%) | 14(77.8%) | 5(83.3%) | 0.179 |
| | Headache | 2(2.6%)[a] | 1(5.6%)[a] | 0(0%)[a] | |
| | Backache | 1(1.3%)[a] | 1(5.6%)[a] | 0(0%)[a] | |
| | Panic attacks | 2(2.6%)[a] | 0(0%)[a] | 0(0%)[a] | |
| | Pain sensation | 1(1.3%)[a] | 1(5.6%)[a] | 0(0%)[a] | |
| | Shoulder pain | 0(0%)[a] | 1(5.6%)[a] | 0(0%)[a,b] | |
| | Trembling | 0(0%)[a] | 0(0%)[a,b] | 1(16.7%)[b] | |
| Satisfaction | Yes | 72(92.3%) | 14(77.8%) | 6(100%) | 0.123 |
| | No | 6(7.7%) | 4(22.2%) | 0(0%) | |
| Preferred in a new operation | Spinal | 72(92.3%)[a] | 14(77.8%)[a] | 0(0%)[b] | **<0.001** |
| | General | 6(7.7%)[a] | 4(22.2%)[a] | 6(100%)[b] | |

Variables were shown as n (%). Chi-square test was applied. Each same superscript (a, b) indicates a subset of group categories that are not statistically significantly different from each other at the p: 0.05 level.

Postoperative satisfaction and negative experiences, if any, of the patients who underwent surgery under spinal or general anesthesia according to their new preferences after information were evaluated. 92.3% of the SS group, 77.8% of the GS group and 100% of the GG group were satisfied with the procedure. When the reasons of the patients who were not satisfied were questioned, they stated the negative experiences they had. In the SS group, 2 patients reported postspinal headache, 1 patient reported backache, 2 patients reported panic attacks due to the sounds they heard from the environment, and 1 patient reported pain throughout the operation. In the GS group, one patient experienced postspinal headache, backache and shoulder pain, and 1 patient stated that they felt pain throughout the operation. No patient in the GG group had any negative experience. All patients were asked about the method they would prefer if they were operated again. There was a statistically significant difference between the groups when the parameter of the method that the patients would prefer if they were operated again was analysed ($p<0.001$). When the groups were compared for subgroup analysis, "Spinal anesthesia preference" was statistically significantly higher in the SS and GS groups than in the GG group ($p<0.05$) (Table 4).

**Discussion**

Obstetric anesthesia is an in-demand and satisfying subspecialty of anesthesiology. Its widespread acceptability and the use of regional anesthesia for delivery have made obstetric anesthesia an important part of many anesthetic practices [7]. In anaesthesia of non-obstetric patients, only one person's safety and optimal conditions are tried to be ensured, whereas in cesarean section, the safety of the mother and the fetus, which is affected by all kinds of changes occurring in the mother, must also be ensured. This gives cesarean anesthesia a distinct feature [8]. There is no ideal anesthetic method for all expectant mothers. The choice of anesthesia depends on the desire of the expectant mother, obstetric needs and the experience of the anesthetist [9].

General and regional anesthesia techniques are used in cesarean section anesthesia. The preference for regional anesthesia in cesarean section has increased significantly over the years. Gulhaş et al. retrospectively examined 2534 cases who underwent cesarean section between 2009 and 2011 from anesthesia follow-up forms and found that regional anesthesia method was applied to 74% of these patients and general anesthesia method was applied to 26%. In a study by Lai et al. [10] in Taiwan, in which 25.606 cases were evaluated, this rate was found to be 95%. Almost all cesarean sections performed in public hospitals in our city are carried out in our hospital. In our study, 94% of the patients were operated under regional anesthesia and we found that we were compatible with the literature in cesarean section anesthesia.

Although regional anesthesia has been the most preferred method by both surgeons and anesthesiologists in recent years, especially in obstetric anesthesia, many patients in Turkey still prefer general anesthesia because of fear of regional blocks [5]. Although this is the preference of patients, many studies in Turkey have shown that the rate of spinal anaesthesia is higher than general anaesthesia in caesarean section surgeries [11]. The majority of our patients had knowledge about spinal anaesthesia due to previous experience and 78 of 102 patients preferred spinal anaesthesia without any information.

Although most studies reported that maternal age did not affect the preference for regional and general anesthesia, in one study [12], the mean age of the subjects included in the study was found to be statistically significantly higher in the regional anesthesia group. No statistically significant difference was found in the mean age and education level of the mothers who participated in our study.

In patients undergoing general anesthesia, the most common preoperative anxiety is the fear of not waking up from anesthesia. In a study conducted by Shevde and Panagopoulos on 800 patients, 39% reported that they had no fear and 35% reported that they were afraid of "not waking up" [13]. Among the fears of our patients related with general anesthesia, fear of excessive narcosis and fear of not waking up were present in accordance with the literature. The reason for preferring spinal anesthesia was due to desire to remain conscious and to see the baby and, breastfeed.

Adequate information should be provided preoperatively to increase the preference for regional anesthesia. The anaesthetist should explain the anaesthesia strategies, advantages and disadvantages to the patient in detail and help the patient to choose the appropriate method [6]. A good preoperative information by the anesthetist is directly related with reducing preoperative fears and increasing intraoperative and postoperative satisfaction with the selected anesthesia method. The preference for general anesthesia was low among our patients. The reasons for the patients' preference for general anesthesia were negative experiences about spinal anesthesia, fear of paralysis and fear of postoperative headache. Our patients who came to the outpatient clinic were informed in detail by the anesthesiologist about the procedure, advantages and disadvantages of anesthesia methods. After the information, 18 of 24 patients who preferred general anesthesia changed their decision to spinal anesthesia. As the reason for the change, they stated that their fears were unfounded and that they had received wrong information.

The most common preoperative fears of patients who underwent regional anesthesia were reported being awake during surgery and experiencing pain during surgery [14]. In our study, when the 6 patients who preferred general anesthesia and whose decisions did not change despite being informed were questioned, they reported that they were 'afraid of being awake and having panic attacks' in accordance with the literature.

In studies conducted in cesarean section cases related with the choice of anesthesia technique, 80-96% of the patients who had previously experienced general and regional anesthesia reported that they were satisfied with regional anesthesia and would prefer it again in the next operation [15]. However, Afolabi et al. [16], who performed a meta-analysis of 29 studies, found that previous anesthesia experience was effective in the decision-making of pregnant women and that the majority of patients were prone to general anesthesia. Kızılkaya et al. compared spinal and general anesthesia methods and found no effect on satisfaction [17]. In our study, 92.3% of the patients who preferred spinal anesthesia and underwent spinal anesthesia and 77.8% of the patients who preferred general anesthesia but underwent spinal anesthesia after being informed reported that they were satisfied with spinal anesthesia and would prefer spinal anesthesia again if they had to undergo surgery again. All 6 patients who received general anesthesia reported that they were satisfied with general anesthesia and would prefer general anesthesia again.

Among the limitations of our study, we thought that it would not be correct to compare both groups in terms of postoperative satisfaction because of the low number of patients receiving general anesthesia. However, we believe that this is a good result for our hospital where regional anesthesia practice is high. Evaluation of the postop pain of the patients according to VAS (Visual Analogue Scale) scoring will be effective in the satisfaction rate. The fact that the pain related to the wound site was not evaluated in our study is our second limitation.

Despite its advantages, spinal anesthesia is not without potential complications. Some complications associated with spinal anesthesia include post dural puncture headache (PDPH), backache, hypotension, urinary retention, infection, bleeding and nerve injury. PDPH is one of the most common complications of spinal anesthesia and its frequency varies between 4% and 40% [18]. Various factors including patient characteristics, needle size, technique and the approach used affect the incidence of PDPH. In our study, the incidence of postop headache was found to be 3% among all patients who underwent spinal anesthesia and this is lower than the PDPH rates we have seen in the literature. We attribute this to the fact that we are a maternity hospital and our anesthetists have high experience in spinal anesthesia. The fact that our needles used were 25 gauge Quincke tipped needles is another important factor.

In conclusion, lack of information and having wrong information due to negative sensations from the environment cause patients to prefer general anesthesia. We think that by determining the preoperative concerns of pregnant women about anesthesia and providing more effective information, pregnant women's preference for spinal anesthesia, which is safer for themselves and their babies in cesarean section operations, can

be increased and their satisfaction can be increased by providing a better experience.

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