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Original Article

Comparison of Patient Satisfaction Between General and Spinal Anaesthesia in Emergency Caesarean Deliveries

Arzu Açıkel[1], Tülün Öztürk[1], Aslı Göker[2], Gonca Gül Hayran[1], Gönül Tezcan Keleş[1]
[1]*Department of Anaesthesiology and Reanimation, Celal Bayar University School of Medicine, Manisa, Turkey*
[2]*Department of Obstetrics and Gynecology, Celal Bayar University School of Medicine, Manisa, Turkey*

Abstract

Objective: Obstetric anaesthesia aims to deliver a healthy baby as well as render a comfortable operation for the mother. This study compared general and spinal anaesthesia in terms of the quality of recovery and patient satisfaction in women undergoing emergency caesarean deliveries.

Methods: In total, 100 patients were enrolled in this prospective, single-blind, cross-sectional clinical study. Patients were divided into spinal (n=50) and general (n=50) anaesthesia groups. The recovery score, pain and satisfaction were evaluated by Quality of Recovery Score (QoR-40), Visual Analogue Scale (VAS) and Numeric Rating Scale (NRS) at 24 hours postoperatively.

Results: The total QoR-40 scores were significantly higher and the total operation time was longer in the spinal anaesthesia group (median score: 194.5 vs. 179.0, p<0.001 and mean±SD: 69.0±13.3 vs. 62.7±13.4 minutes, p=0.02, respectively). There was no significant difference in VAS and NRS scores between the groups.

Conclusion: Both spinal anaesthesia and general anaesthesia have advantages and disadvantages in terms of emergency caesarean deliveries. Spinal anaesthesia speeds up the recovery time and enables the mother to return to normal life earlier, while general anaesthesia has a short initiation time and does not affect patient satisfaction.

Keywords: Emergency caesarean, QoR-40, spinal anaesthesia, general anaesthesia, patient satisfaction

Introduction

Emergency caesarean delivery is a situation where it is essential for both the mother and baby to take fast action. General or spinal anaesthesia is preferred because of the short initiation time (1). The type of anaesthesia is determined according to medical indications and contraindications and patient preference. Spinal anaesthesia is more frequently used in recent years because it has lesser mortality and morbidity rates than general anaesthesia (2-6). General anaesthesia is appropriate when spinal anaesthesia is contraindicated or when it is an urgent and emergent case (4, 5, 7, 8).

Emergency operations and female gender are factors that increase anxiety preoperatively (9, 10). Patients admitted for emergency caesarean delivery are neither physically nor psychologically prepared for the operation. The fasting time is not enough. Thus, these patients usually lack the opportunity to choose the mode of anaesthesia.

The Quality of Recovery-40 (QoR-40) scale evaluates the quality of recovery postoperatively, and the Turkish form has been shown to be valid and reliable (11, 12). Studies investigating the quality of recovery after general and spinal anaesthesia in emergency caesarean deliveries are scarce.

The aim of this study was to compare patient satisfaction with the anaesthesia method after emergency caesarean delivery performed under general or spinal anaesthesia using QoR-40.

Address for Correspondences: Arzu Açıkel E-mail: arzukefi@yahoo.com
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Methods

Patients

Turkish-speaking pregnant women over 18 years of age were enrolled in this study. Inclusion criteria were having a primary school or above graduate degree as well as being cooperated and oriented with American Society of Anesthesiologists (ASA) score of I–II. Patients with foetal anomaly, intrauterine exitus, multiple gestations, maternal psychological illness or conception after rape; cases of maternal death; judicial cases and cases who started as spinal block but turned to general anaesthesia, who were participating in another study or who were internalised in the intensive care unit were excluded from the study.

Study protocol

This was a prospective, single-blind (the investigator who evaluated the patients on the postoperative day was blinded to the study), cross-sectional clinical study. Local ethical committee approval (23.10.2013 No:20.478.486-261) was obtained prior to the study, and informed consents were received from all the patients. Intravenous catheters were placed to infuse crystalloid solution followed by antiacid and antiemetic prophylaxis and standard monitorisation. After informing the patient, the mode of anaesthesia was determined by the anaesthetist according to medical indications and contraindications and patient preference.

Spinal anaesthesia group (Group SA) (n=50): After spinal block with a 25 Gauge (G) (Braun®, U.S.A) Quincke spinal needle between the L3–L4 intervertebral space, spinal anaesthesia was achieved by 10 mg hyperbaric bupivacaine injection. After delivery, sedation was achieved by IV 0.04 mg kg^{-1} midazolam. 10 IU of oxytocin in 500 mL of Ringer's lactate solution were administered.

General anaesthesia group (Group GA) (n=50): Induction of general anaesthesia was provided by IV 2 mg kg^{-1} propofol and 1 mg kg^{-1} succinylcholine. Maintenance of muscle relaxation was facilitated by 0.1 mg kg^{-1} mivacurium. Ventilation was adjusted to keep end-tidal CO_2 at 35 mmHg. In total, 50% of N_2O–O_2 mixture in 0.75 MAC sevoflurane was used to maintain the anaesthesia until the end of the operation.

After delivery, 2 μg kg^{-1} fentanyl and 10 IU of oxytocin in 500 mL of Ringer's lactate solution were administered. At the end of surgery, all patients received 50 mg dexketoprofen (IV). Patients were extubated according to tidal volumes and reactions to verbal commands. Residual neuromuscular block was antagonised by neostigmine and atropine.

Apgar scores of babies in both the groups were recorded at 1st and 5th minutes. GA group patients were discharged to obstetric ward according to Aldrete scoring (Aldrete 9-10), SA group patients were discharged accordind to Bromage scoring (Bromage 1-2).

The routine postoperative analgesic protocol was performed in the obstetric ward. At 24 hours postoperatively, QoR-40, Visual Analogue Scale (VAS) and Numeric Rating Scale (NRS) were applied to the patients by the investigator blinded to the mode of anaesthesia. QoR-40 consists of 40 questions, which evaluate emotional status (ES, 9 questions), physical comfort (PC, 12 questions), Patient support (PS, 7 questions), physical independence (PI, 5 questions) and pain (P, 7 questions). Each question is scored between 1 and 5. The lowest possible score is 40, and the highest possible score is 200. The reliability and validity for Turkish have been shown by Karaman (12). The discomfort due to pain (VAS=0 no pain, VAS=10 the most intense pain) in the last 24 hours, the satisfaction of patient (NRS=1 not satisfied at all, NRS=10 very satisfied) and the relationship with the type of anaesthesia were evaluated.

Statistical analysis

The Number Cruncher Statistical System (NCSS 2007 Kaysville, Utah, USA) was used for statistical analysis. Descriptive (mean, median, standard deviation, frequency, ratio, minimum and maximum values) and quantitative data were compared by Student's t test in case of normal distribution. Otherwise, Mann–Whitney U test was used. Qualitative data were compared by Pearson chi-square test and Fisher–Freeman–Halton exact test. Spearman correlation analysis was used to investigate the relationship between variables. Internal consistency reliability of the QoR-40 questionnaire and the 5 subgroups was tested by Cronbach-α values. A p value less than 0.05 was considered statistically significant.

Results

Of the eligible 376 patients, 100 who met the inclusion criteria and agreed to participate in the study were enrolled.

The median age of the patients was between 18 and 40 years (mean: 28.3±5.7). Most women had graduated from primary school (43%). The majority had no history of previous surgery (70%, n=70), 20% had experienced general anaesthesia and 10% had experienced regional anaesthesia previously.

The indications for caesarean deliveries included repeat caesarean section (25%, n=25), foetal distress (24%, n=24), pre-eclampsia (14%, n=14) placental abnormalities (10%, n=10), oligohydramnios (7%, n=7), cephalo–pelvic disproportion (6%, n=6), breech presentation (4%, n=4), macrosomia (3%, n=3), surmaturity (3%, n=3), meconium staining (3%, n=3) and intrauterine growth retardation (1%, n=1).

The average operation time was 65.9±13.7 minutes (range: 30–100 minutes).

The Apgar scores at 1 minute were between 6 and 10 [median and interval quartile: 10.0 (10.0–10.0)], while those at 5 minutes were between 8 and 10 [median and interval quartile: 10.0 (10.0–10.0)].

The average VAS score and satisfaction with the anaesthesia type score were 3.5±1.6 and 8.3±1.1, respectively.

There were no significant differences with regard to age, education level, history of caesarean delivery, Apgar scores, satisfaction with the type of anaesthesia, VAS scores and history of anaesthesia between the 2 groups (p>0.05).

The average operation time (totally of anaesthesia and surgery time) of Group SA was significantly longer than that of Group GA (69.0±13.3 vs. 62.7±13.4, p=0.02).

The PC, ES, PS, PI and P scores and total QoR-40 scores were significantly higher in Group SA (p≤0.001 and p<0.001) (Table 1).

There was no significant difference between the total operation time in any type of anaesthesia and scores of subgroups of QoR-40 (p>0.05).

There was no significant relationship between VAS scores and PC, PS and PI scores in the Group SA (r=–0.21, p=0.2; r=–0.24, p=0.1 and r=–0.10, p=0.5, respectively). There was a moderate inverse relationship between VAS scores and ES and P scores in Group SA (r=–0.31, p=0.03 vs. r=–0.34, p=0.02). A moderate inverse relationship was found between VAS scores and total QoR-40 scores in Group SA (r=–0.31, p=0.03).

There was no significant relationship between VAS scores and ES, PS, PI and P scores in Group GA (r=–0.27, p=0.06; r=–0.11, p=0.45; r=–0.15, p=0.31 and r=–0.26, p=0.07, respectively). There was a moderate inverse relationship between VAS scores and PC scores in Group GA (r=–0.37, p=0.008). A moderate inverse relationship was found between VAS scores and total QoR-40 scores in Group GA (r=–0.30, p=0.04).

No significant relationship was found between patient satisfaction and PC, PS and PI scores in Group SA (r=0.14, p=0.3; r=0.22, p=0.1 and r=–0.03, p=0.9, respectively). There was a moderate and inverse relation between patient satisfaction and ES and P scores in Group SA (r=0.30, p=0.04 and r=0.28, p=0.05, respectively). There was a moderate and direct relation between patient satisfaction and total QoR-40 scores in this group (r=0.31, p=0.03).

There was no significant relationship between patient satisfaction and QoR-40 subgroup scores in Group GA (p>0.05).

To determine internal consistency reliability, Cronbach-α values were calculated. The overall Cronbach-α value was found to be 0.92 and varied between 0.61 and 0.93. The highest value was for 'physical independence' and the lowest was for 'pain' (Table 2).

The results of QoR-40 for both groups are presented in Table 3.

Discussion

The results of this study indicated that recovery scores were significantly better in patients undergoing emergency caesarean delivery under spinal anaesthesia than in those undergoing emergency caesarean delivery under general anaesthesia. Moreover, the total recovery scores correlated with VAS scores. Further, satisfaction with the mode of anaesthesia was related to emotional status and pain subgroups of QoR-40 in Group SA. There was no relationship

Table 2. Subgroup scores of QoR-40

	Question number	Median±SD	Min–Max	Cronbach-α
PC	12	55.0±3.9	47–60	0.77
ES	9	42.8±2.5	36–45	0.76
PS	7	33.4±2.7	13–25	0.93
PI	5	21.1±4.0	23–35	0.93
P	7	32.3±1.7	27–35	0.61
Total	40	184.6±11.4	157–199	0.92

PC: physical comfort; ES: emotional status; PS: psychological support; PI: physical independence; P: pain; SD: standard deviation

Table 1. QoR-40 scores according to mode of anaesthesia

QoR-40	Total (n=100)	SA (n=50)	GA (n=50)	
Subgroups	Median (IQ)	Median (IQ)	Median (IQ)	[a]p
PC	56.0 (52.0–58.0)	57.5 (56.0–59.0)	53.5 (50.0–56.0)	<0.001
ES	44.0 (42.0–45.0)	45.0 (42.0–45.0)	42.0 (39.0–44.0)	<0.001
PS	35.0 (33.0–35.0)	35.0 (35.0–35.0)	34.0 (29.0–35.0)	0.01
PI	21.5 (17.0–25.0)	25.0 (22.0–25.0)	18.0(16.0–21.0)	<0.001
P	33.0 (31.0–34.0)	33.5 (33.0–34.0)	32.0 (30.0–33.0)	<0.001
Total	186.0 (175.5–195.0)	194.5 (187.0–197.0)	179.0 (169.0–186.0)	<0.001

PC: physical comfort; ES: emotional status; PS: psychological support; PI: physical independence; P: pain; IQ: interval quartile, [a] Mann–Whitney U test

Table 3. Comparison of the questionnaire in both groups (Median±SD)

	SA (n=50)	GA (n=50)	[a]p
Physical comfort			
Able to breathe easily	4.74±0.69	4.44±0.88	0.07
Able to sleep well	4.58±0.84	3.96±0.86	<0.001
Able to enjoy food	4.60±0.70	3.88±0.70	<0.001
Able to feel rested	4.64±0.66	3.92±0.72	<0.001
Nausea	4.94±0.24	4.70±0.51	0.06
Vomiting	5.00±0.00	4.90±0.36	0.5
Dry-retching	4.98±0.14	4.88±0.33	0.4
Feeling restless	4.70±0.51	4.42±0.64	0.04
Shaking or twitching	4.56±0.50	4.46±0.50	0.4
Shivering	4.54±0.50	4.44±0.50	0.4
Feeling cold	4.64±0.48	4.42±0.54	0.07
Feeling dizzy	4.86±0.35	4.78±0.51	0.7
Emotional status			
Feeling of general well-being	4.64±0.66	4.00±0.81	<0.001
Feeling in control	4.72±0.54	4.02±0.80	<0.001
Feeling comfortable	4.70±0.54	4.06±0.79	<0.001
Having a bad dream	4.94±0.24	4.88±0.83	0.6
Felling anxious	4.98±0.30	4.90±0.14	0.5
Feeling angry	5.00±0.00	4.96±0.20	0.7
Feeling depressed	4.98±0.14	4.98±0.14	1.0
Feeling alone	4.98±0.14	4.98±0.14	1.0
Having difficulty in falling asleep	4.98±0.14	4.90±0.36	0.6
Patient support			
Able to communicate with hospital staff in the hospital	4.82±0.54	4.54±0.39	0.02
Able to communicate with family and friends	4.82±0.44	4.56±0.54	0.03
Getting support from doctors in the hospital	4.82±0.44	4.64±0.56	0.2
Getting support from nurses in the hospital	4.84±0.42	4.64±0.60	0.2
Getting support from family and friends	4.88±0.39	4.70±0.54	0.2
Able to understand the instructions and advice	4.84±0.42	4.64±0.60	0.2
Feeling confused	4.98±0.14	5.00±0.00	0.9
Physical independence			
Having normal speech	4.88±0.33	4.48±0.65	0.004
Able to wash face, brush teeth or shave	4.66±0.63	3.82±0.87	<0.001
Able to look after own appearance	4.64±0.69	3.56±0.91	<0.001
Able to write	4.56±0.79	3.58±0.93	<0.001
Able to return to work or usual home activities	4.58±0.70	3.46±0.97	<0.001
Pain			
Moderate pain	3.96±0.45	3.70±0.51	0.04
Severe pain	4.74±0.48	4.36±0.44	<0.001
Headache	4.76±0.46	4.78±0.48	0.9
Muscle pains	4.86±0.40	4.84±0.42	0.9
Backache	4.86±0.35	4.78±0.46	0.6
Sore throat	4.98±0.14	4.38±0.49	<0.001
Sore mouth	4.98±0.14	4.62±0.49	0.002

SD: standard deviation, [a]Mann–Whitney U test

of satisfaction with anaesthesia type and recovery scores in Group GA.

Studies have shown that the level of anxiety is high in women and in patients who have undergo emergency surgery (9, 10). Emergency caesarean delivery is an immediate decision; psychological or preoperative preparation is not sufficient in such cases and it is associated with a risk of foetal–maternal mortality and morbidity. Thus, it stresses the mother. Preoperative anxiety may increase if the mode of anaesthesia applied is different from the patient's anticipation. General or spinal anaesthesia is preferred to decrease the delay time in emergency caesarean deliveries (1, 13, 14). General anaesthesia has more risks than regional anaesthesia; however, it is preferred in urgent or emergency caesarean deliveries or when spinal anaesthesia is contraindicated (7, 8, 15). However, spinal anaesthesia is recently being preferred in emergency caesarean deliveries because it decreases the gastric aspiration risk and has better outcomes in terms of mortality and morbidity (2-4). The patient has to be supported psychologically because she will be awake. A study from India showed that preoperative contact did not decrease anxiety; however, intraoperative psychological support, showing the baby to her mother and early breastfeeding were related to patient satisfaction in patients undergoing caesarean delivery under spinal anaesthesia (16). Another analysis including 1793 patients in 22 studies showed that when women were asked which mode of anaesthesia they would prefer in subsequent surgery, those who received general anaesthesia stated that they would prefer general anaesthesia again (17).

A study from England evaluated anxiety levels and recovery scores and showed that anxiety levels were high in women preoperatively and dropped significantly postoperatively (9). The same study concluded that preoperative anxiety had no effect on recovery scores, but postoperative anxiety levels were correlated with recovery scores. In this study, we enrolled patients undergoing emergency caesarean delivery and excluded the ones likely to have health problems to avoid postoperative anxiety that may affect recovery scores.

Gower et al. (18) showed that when QoR-40 was applied by the researcher, it took less time and the results were more accurate. In our study, the investigator applied the questionnaire. The Turkish version of QoR-40 has been tested for validity and reliability (12). Cronbach-α values were suitable for our study group. Total and subgroup scores of QoR-40 were better in Group SA. Similar to our results, Catro-Alves et al. (19) found that in patients who had undergone abdominal hysterectomy, regional anaesthesia had better recovery scores. The same study showed that opioid agents was applied less commonly in the regional anaesthesia group postoperatively and this was related to better recovery scores (19). We did not find a significant difference in VAS scores between the Group GA and Group SA, but when pain increased in Group GA, physical comfort and total recovery scores decreased. When pain increased in Group SA, emotional status, pain and total scores decreased. These results show that pain management in the postoperative period will have a positive impact on recovery. When comparing the pain subgroups of moderate pain, severe pain, sore throat and sore mouth in QoR-40, spinal anaesthesia seemed to improve postoperative pain control. The results of our study showed that Group SA had a significantly longer operation time, but there was no relation between recovery scores and operation time. This may be attributed to the short duration of caesarean deliveries; recovery scores may be influence by the operation time in surgical operations with long operation times. In emergency caesarean deliveries, mortality and morbidity of the mother and baby are important issues; therefore, even though recovery scores may be better in case of spinal anaesthesia, it may be second choice in urgent and emergency cases. Thus the decision of the mode of anaesthesia needs to be taken after discussion between the obstetrician and anaesthesiologist.

One of the limitations of this study was the absence of a scale evaluating satisfaction with the mode of anaesthesia and the presence of multiple factors affecting satisfaction. We evaluated only pain and quality of recovery in our study. Perioperative experiences and previous surgeries may affect the satisfaction state. Another limitation was that emergency caesarean delivery comprises a wide range of indications. There was no randomisation because the method of anaesthesia was chosen according to the medical state of the mother and baby. Standard criteria were used for choosing the most appropriate method.

Conclusion

Spinal anaesthesia is the first choice of anaesthesia even in selected emergency caesarean deliveries because it speeds up the recovery process postoperatively. General anaesthesia may be preferred in urgent and emergency cases to decrease the initiation time of surgery. All patients should be questioned quickly by the obstetrician and anaesthesiologist and the mode of anaesthesia should be chosen accordingly.

Ethics Committee Approval: Ethics committee approval was received for this study from the ethics committee of Celal Bayar University School of Medicine (23.10.2013, No:20.478.486-261).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

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