

Difference in effects on sleep quality and stress depending on anesthetic methods in women who underwent cesarean section in Korea

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Objective: To find which anesthesia type is better in managing stress and sleep quality of laboring mothers in Korea.

Methodology: We surveyed pregnant women who were healthy, their first labor, under the age of 34, and delivering by elective cesarean section about their stress scale and sleep quality before the operation and 10 days after the operation. Sleep quality and stress scale were assessed by using the Pittsburgh Sleep Quality Index (PSQI) and the Perceived Stress Scale (PSS). Fifty patients for elective cesarean section were divided into two groups; 25 patients had general anesthesia (group G) and 25 patients had spinal anesthesia (group S).

Results: Both pre and postoperative mothers had no significant different scale of sleeping quality and stress regardless of the types of anesthesia (general or spinal) regardless of the time (timing) of cesarean section ($P > 0.05$). Still, mothers had a sleeping problem and stress.

Conclusion: No correlation about sleep quality and stress scale between two anesthetic types was found. However, preoperative and postoperative laboring mothers in both groups had slight sleeping problems and stress. (Rawal Med J 201;41:471-475)

Key words: Cesarean section, general anesthesia, psychological stress, sleep, spinal anesthesia.

INTRODUCTION

Cesarean section rate (CSR) has increased greatly in the last 30 years. In Korea CSR has consistently increased for more than 20 years, followed by a slight decrease after 2000, and a level rate of 36.37% maintained after 2006.¹ Indications for cesarean section (CS) include previous CS, anomalies involving the position of the fetus, fetal distress syndrome, and fetal dystocia. It can be emergency CS involving placental abruption or can be elective. Methods of anesthesia involve general anesthesia, regional anesthesia (epidural anesthesia and spinal anesthesia), and combined spinal-epidural anesthesia.² A study of stress levels utilizing the General Health Questionnaire (GHQ-30) and the Beck Depression Inventory (BDI) comparing mothers who had undergone either a cesarean section or normal vaginal delivery revealed that several of the mothers who had received CS felt loss, asthenia, and anger.³ There are also studies that show that mothers who have undergone CS suffer from lower quality of sleep. Mothers who underwent normal vaginal delivery had an average total sleep time (TST) of 6.5 hours with

14% experiencing wake after sleep onset (WASO), whereas mothers who underwent CS had a TST of 4 hours, and 34% experienced WASO.⁴ Mothers who underwent CS felt more fatigue and experienced insufficient sleep time. The quality of nighttime sleep also apparently differs according to anesthetic method.⁵ In terms of the quality of nighttime sleep in relation to the type of anesthetic method used in mother who underwent CS, mothers who received epidural anesthesia had better sleep quality than mothers who received general anesthesia.⁶

This type of sleep disorder may interfere with breastfeeding. If contact with a child is difficult due to a sleep disorder, the first breastfeeding period may be pushed to a later time.⁷ In addition, there are studies that show that low quality of sleep postpartum may contribute to the development of symptoms of postpartum depression.⁸ Mothers who suffer from postpartum depression show lower levels of responsibility toward their children and tend to ignore responsibilities such as breastfeeding and settling the child.⁹ The purpose of this study was to compare the effects of general and regional

anesthesia during CS on the mothers in terms of quality of sleep and stress levels in Korea.

METHODOLOGY

A total of 50 mothers classified as American Society of Anesthesiologists physical status I were divided into 2 groups; 25 each to receive either general (Group G) or regional anesthesia (Group S) at the Soon Women's Hospital and the Mirae Women's Hospital, Busan, Korea. Exclusion criteria included mothers older than 34 years, mothers expecting multiple children, multiparas, women experiencing premature labor, foreign mothers, mothers who had previously suffered from sleep disorders, patients who had low consciousness or had difficulty in responding to the surveys, patients who received postpartum treatment at other facilities, and patients without guardians or assisting personnel postpartum. The study was approved by the Inje University Busan Paik Hospital's Medical Life Research Ethics Review Committee. Pittsburgh Sleep Quality Index (PSQI) for quality of sleep and the Perceived Stress Scale (PSS) for stress levels were used. A first stage survey was conducted one hour before the CS was performed, and the second stage survey was conducted 10 days (± 1 day) postpartum. The duration of time for a survey was 15 minutes.

The PQSI is a survey that reviews the quality of sleep for a period of one month.¹⁰ It is composed of 19 questions regarding sleep time, sleep latency, subjective sleep quality, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping medication, daytime dysfunction, and others divided into 7 different areas in order to review the quality of sleep.¹¹ The questions for each of the 7 areas were scored from 0 (No Problems) to 3 (Frequent Problems or 3 or More Occurrences a Week) for a total score of 0-21.¹² A higher score indicates that a patient's quality of sleep is low. Patients can typically be classified into two groups, with bad sleepers scoring 5 points or more and good sleepers scoring fewer than 5 points.¹³

The PSS survey was developed to measure nonspecific stress.¹⁴ The PSS is a tool that considers the overall awareness of an individual's stress levels regarding health or other issues for a period of 1 month. Each item is scored on a scale of 0-4 with the

total score ranging from 0-40 points. A higher score indicates that an individual is experiencing more stress. Four of the 10 questions (Items 4, 5, 7, and 8) review the positive state and the scores for these questions are applied differently from the rest of the negative state analysis questions. Total scores ranging from 0-17 are normal, scores of 18-25 indicate low levels of stress, and scores of 26-40 indicate high levels of stress.¹⁴

Statistical analysis was conducted using SAS 9.3 (SAS Institute Inc., Cary, NC, USA). T-tests were used to compare the numerical data between the two groups. Categorical variables were analyzed via the Chi-square test or Fisher's exact test. P value < 0.05 were considered statistically significant.

RESULTS

The mean total PSQI score for group S prior to the surgery was 6.64 ± 3.07 points, and the mean total score was 7.44 ± 4.28 points post surgery. The corresponding results for group G were 7.44 ± 1.96 points prior to the surgery and 8.56 ± 3.25 points post surgery. Patients in both groups with scores of 5 points and above were classified as bad sleepers. The two groups did not show a significant difference in their results either prior to or after the surgery in all 7 areas of the PSQI. The number of patients with total PSQI scores above 5 points in group S was 18 (73%) prior to the surgery and 16 (64%) after the surgery. In group G, there were 23 patients (92%) with scores above 5 points prior to the surgery and 22 patients (88%) with scores above 5 points after the surgery (Table 1).

Table 1. Comparison of PSQI score between spinal anesthesia group and general anesthesia group.

	Group S (n=25)		Group G (n=25)		P value
	Pre	Post	pre	post	
PSQI total score	6.64 ± 3.07	7.44 ± 4.28	7.44 ± 1.96	8.56 ± 3.25	0.777
Sleep quality	1.28 ± 0.46	1.40 ± 0.65	1.60 ± 0.50	1.32 ± 0.48	0.379
Sleep latency	1.96 ± 1.24	1.20 ± 1.19	2.16 ± 0.94	1.88 ± 0.78	0.147
Sleep duration	0.52 ± 0.82	1.20 ± 1.15	0.60 ± 0.82	1.68 ± 0.95	0.264
Sleep efficiency	0.68 ± 1.03	0.88 ± 1.24	0.96 ± 1.14	1.60 ± 1.26	0.271
Sleep disturbance	1.64 ± 0.57	1.52 ± 0.59	1.48 ± 0.51	1.20 ± 0.41	0.295
Sleep medication	0.16 ± 0.47	0.28 ± 0.79	0.12 ± 0.33	0.64 ± 0.95	0.141
Daytime dysfunction	0.40 ± 0.58	0.96 ± 0.93	0.52 ± 0.51	1.04 ± 0.98	0.895
PSQI total score ≥ 5	18(72%)	16(64%)	23(92%)	22(88%)	0.066
PSQI total score < 5	7(28%)	9(36%)	2(8%)	3(12%)	

Values are presented as means \pm SD or number of patients (percentage). PSQI: Pittsburgh Sleep Quality Index. Group S: spinal anesthesia. Group G: general anesthesia

Table 2. Comparison of PSS score between spinal anesthesia group and general anesthesia group.

	Group S (n=25)		Group G (n=25)		P value
	pre	post	pre	post	
PSS total score	17.12 ± 5.58	17.84 ± 5.45	16.56 ± 2.97	16.24 ± 4.09	0.540
Normal(0-17)	16(64%)	12(48%)	16(64%)	16(64%)	0.393
Mild(18-25)	6(24%)	12(48%)	9(36%)	9(36%)	
Severe(26-40)	3(12%)	1(4%)	0(0%)	0(0%)	

Values are presented as means ± SD or number of patients (percentage). PSS: Perceived Stress Scale. Group S: spinal anesthesia. Group G: general anesthesia

Comparison of the PSS results of the two groups revealed that both groups showed an average of 17 points, meaning that the results leaned toward low levels of stress but were classified as normal. There was no significant difference between the two groups in the various PSS question areas either prior to or after the surgery. However, there was one patient in group S who showed severe levels of stress (Table 2).

DISCUSSION

There was no significant difference between the two groups in regard to quality of sleep and levels of stress either prior to or after the surgery. However, disregarding the anesthetic method that was received, patients showed poor sleep quality and low levels of stress both prior to and after performance of CS. It is known that increases in stress levels and deterioration of the quality of sleep for the mother have detrimental effects on both the mother and the newborn.⁷⁻⁹

Sleeping disorders or poor sleep during pregnancy are common conditions which was caused by increased progesterone levels and it reduces deep sleep (slow-wave sleep).¹⁵ Furthermore, during the later stages of pregnancy, as the fetus grows and begins compressing the chest, pregnant women could experience difficulty having comfortable sleep. Even for postpartum women, they also have the same sleeping disorders. The most reasons for sleep disturbances are related to pain from uterine contractions, cesarean section wounds, and breast distension.¹⁶

The results of this research, which show that there is no overall difference in quality of sleep according to the method of anesthesia used, are consistent with

existing research results. Webster et al⁶ concluded that there was no difference between sleep and comfort according to the method of anesthesia in a comparative study on mothers who underwent cesarean section with either general or epidural anesthesia. General anesthesia for CS has been shown higher maternal morbidity and mortality than regional anesthetic techniques.¹² Therefore, regional anesthesia is now used more often in elective caesarean section.

Studies have shown that patients have a preference for spinal anesthesia over epidural anesthesia.¹⁷ The reason for this is that spinal anesthesia is easy to perform, is relatively safe, and is inexpensive. Furthermore, anesthetic effects appear more quickly and have a lower rate of failure. This is the primary reason for which spinal anesthesia was selected rather than epidural anesthesia in the current study.

The anxiety felt by a patient prior to surgery is a complex and subjective sense that is influenced by the patient's characteristics, tendencies, stress levels, and understanding of her own state or surgical procedures. Anxiety regarding general anesthesia is related to side effects after the anesthesia, lack of information on general anesthesia, loss of consciousness due to anesthesia, and the uncertainty of regaining consciousness afterward.¹⁸ In studies conducted on mothers who underwent cesarean sections with regional anesthesia, patients feared that they would be conscious during the surgery and it be an uncomfortable and frightening experience and they also worried that equipment would be left within their bodies. Patients also felt anxiety due to the uncomfortable environment.¹⁹

These findings are considered the primary reason for why the PSS total score and severity is higher in patients undergoing spinal anesthesia compared to those undergoing general anesthesia in the current study. In addition, the low stress levels recorded before and after surgery in both groups are consistent with the findings of previous studies.²⁰ However, there is also previous research that shows that general anesthesia induces a higher maternal stress response than epidural anesthesia.²¹ The reason for the difference in research results could be a result of survey methods and different research periods.

The limitations of this study are as follows: first, this research was conducted on patients at a selected region in two different hospitals and may be limited in generalizability due to the low number of participants. The sample of participants was composed of women who could easily be accessed by the researchers, and thus may have been influenced by sample selection. As such, the sample size of this research may not be an accurate representation of the larger population. Second, the PSQI and PSS surveys are normally used to review the quality of sleep and stress levels for a period of one month, but in the current study, they were conducted in a much shorter period of 10 days due to the duration of postpartum treatment. Furthermore, most mothers suffer from anxiety before birth, which may mean that certain complex questions presented within the surveys were difficult to answer objectively. There was also no consideration of the correlation between quality of sleep and stress levels with various day-to-day factors such as quality of life, level of fatigue, and functional disability levels. As such, the credibility of this research can be increased by more objective research through methods such as sleep diversification tests and sleep logs as well as longer research periods involving stress measurement practices during pregnancy and birth.

CONCLUSION

There was no evidence that general or spinal anesthesia received during cesarean sections had an effect on quality of sleep or stress levels.

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