International Journal of Health Sciences and Research
www.ijhsr.org ISSN: 2249-9571

Original Research Article

The Role of Maternal Preoperative Anxiety on Hypotension after Spinal Anaesthesia in Caesarean Delivery

Alma Soxhuku (Isufi)[1], Adriana Misja[1], Vjollca Shpata[2], Agron Delilaj[1], Dritan Xhangolli[1], Hektor Sula[3]

[1]Department of anesthesia and intensive care in University Hospital of Obstetrics and Gynecology "Koço Gliozheni", Tirana.
[2]Faculty of Technical Medical Sciences, University of Medicine in Tirana.
[3]Department of Anesthesia and Intensive care, Faculty of Medicine, University of Medicine in Tirana.

Corresponding Author: Vjollca Shpata

Received: 02/03/2016 *Revised: 23/03/2016* *Accepted: 31/03/2016*

ABSTRACT

Aim: To aim of this study was to find any correlation between preoperative anxiety and arterial pressure changes after spinal anaesthesia for Caesarean delivery.
Methods: A prospective observational study in 164 healthy pregnant women ASA (American Society of Anesthesiologists) physical status 2, that underwent elective caesarian section under spinal an aesthesia, during the 2 years period 2014-2015 in University Hospital of Obstetrics and Gynecology "Koço Gliozheni" in Tirana.
Preoperative anxiety was assessed in the preoperative ward on the day of surgery using verbal analogue scale (VAS) anxiety score.
The main variable under the study was VAS preoperative anxiety score. The dependent variables were the maximum percentage change in systolic blood pressure after spinal anaesthesia with respect to baseline, and the maximal absolute change in systolic blood pressure after anesthesia from baseline.
Results: 79.9% of the patients declared medium and high levels of preoperative anxiety according VAS.
When comparing low, medium, and high preoperative anxiety based upon the VAS score, there was a significant effect on the maximal % change of systolic blood pressure after spinal anaesthesia (one-way ANOVA, $P < 0.001$) and on the maximal absolute change in systolic blood pressure after spinal anaesthesia (one-way ANOVA, $P < 0.001$).
Conclusion: Preoperative anxiety, assessed by a simple subjective VAS score, had a significant effect on hypotension after spinal an aesthesia for Caesarean delivery. Anesthesiologist may contribute on decreasing anxiety in the patients before operation giving psychological support and assurance, also giving adequate information about the procedures and their possible complications.

Key words: Caesarean delivery, spinal an aesthesia, hypotension, preoperative anxiety, VAS.

INTRODUCTION

Spinal an aesthesia is often the preferred choice of an aesthesia for Caesarean delivery, because of the simplicity of technique, rapid onset and dense neural blockade. [(1)] However, hypotension associated with spinal an aesthesia is a common complication during Caesarean delivery. [(2,3)] Maternal hypotension after spinal an aesthesia depends on many factors: maternal positioning, level of anesthesia, dose of local anesthetic, speed of injection, preloading and co-loading, maternal age and weight, neonatal weight. [(4,5)]

Anxiety symptoms in the medical patients are results of uncertainty in medical and surgical treatment. [(6)] Anxiety is

common in surgical patients; it can result from the fear of the surgery or any possible complications, including death due to anesthesia and/or the surgery.

The sympathectomy resulting from the neuraxial blockade after spinal an aesthesia is exaggerated by the physiological changes of pregnancy and puerperium, leading to hypotension in as much as 55%-90% of the mothers receiving spinal an aesthesia for Caesarean delivery. [7] Anxiety causes generalized sympathetic activation. [8] The patients with higher baseline sympathetic activation have been shown to have more marked hypotension after spinal anaesthesia. [9,10]

Te aim of this study was to find any correlation between preoperative anxiety and arterial pressure changes after spinal anaesthesia for Caesarean delivery.

MATERIALS AND METHODS

This study was approved by the Ethics Committee of the University of Medicine, Tirana, Albania. It has been performed in accordance with the ethical standards displayed in the 1964 Declaration of Helsinki and its later amendments. Written informed consent was obtained from all patients. Data were made anonymous for analysis.

A prospective observational study in 164 healthy pregnant women ASA (American Society of Anesthesiologists) physical status 2, that underwent elective Caesarean delivery under spinal an aesthesia, during the 2 years period 2014-2015 in University Hospital of Obstetrics and Gynecology "Koço Gliozheni" in Tirana.

Exclusion criteria: active labour, chronic hypertension or preeclampsia, other active medical or psychiatric disorders requiring regular medication, and any contraindication for spinal anaesthesia.

Pre-anaesthesia anxiety, or preoperative anxiety was assessed in the preoperative ward on the day of surgery using verbal analogue scale (VAS) anxiety score. [11] Parturients were asked to rank subjective anxiety on a VAS, where 0 was no anxiety at all and 10 the worst anxiety imaginable.

After examination for normal distribution,VAS were transformed into ordinal groups corresponding to high (VAS: 7-10), medium (VAS: 4-6), and low anxiety (VAS: 0-3).

All patients fasted for at least 8 hours before induction of spinal anesthesia. Upon arrival to the operating room, all patients were monitored for basal vital signs (heart rate: HR, systolic and diastolic blood pressures: BPs, and pulse oximetry: SaO_2). Baseline systolic arterial blood pressure was measured by averaging 3 readings taken 1 minute apart using an automated device for non-invasive blood pressure assessment. An 18-G IV catheter was placed in a peripheral vein in the patient's upper limb, and before performing spinal anesthesia, all patients received a preload of 1500 mL lactated Ringer's solution.

After completion of fluid infusions all patients received spinal anesthesia by an anesthesiologist, in sitting position at L3-L4 inter vertebral space, using 26-gauge, pencil point needle. Hyperbaric bupivacaine 12.5 mg mixed with preservative-free fentanyl 10 µg and morphine 200 µg was injected over 30 seconds. Immediately after spinal anesthesia, all patients were positioned in the supine position with left uterine displacement. Concomitantly to the intrathecal injection the patient received 10 mL/kg of lactated Ringer's solution, after that the rate of administration of IV fluids was reduced to keep vein open until the delivery of the infant.

Blood pressure was controlled every minute until delivery and then every five minutes throughout anesthesia. HR and SaO_2 were monitored throughout anesthesia.

Hypotension was considered a decrease in systolic blood pressure > 20% of baseline (prior to drugs being placed in the neuraxis). [12] If, at any time, maternal systolic blood pressure was < 80% baseline, 5 mg bolus Ephedrine followed by 1mg/min infusion if necessary were used.

Statistical analysis

Continuous variables were presented as the mean ± SD (standard deviation). Categorical variables were expressed as actual numbers and percentages (%). The main variable under the study was VAS preoperative anxiety score. VAS anxiety scores were transformed to ordinal groups corresponding to low, medium, and high preoperative anxiety as described above. The dependent variables were the maximum percentage change in systolic blood pressure after spinal anaesthesia with respect to baseline, and the maximal absolute change in systolic blood pressure after anesthesia from baseline. Dependent variables were analysed as continuous data; low, medium, and high preoperative anxiety groups were compared using one-way analysis of variance (one-way ANOVA) and differences between the groups compared using t-test.

Statistical significance was considered at the level of $p \leq 0.05$. All tests were two tailed. SPSS statistical package version 15.0 was used to analyze the data.

RESULTS

164 patients were enrolled in this study. Patient characteristic data are presented in table 1 based on the three groups according to the level of preoperative anxiety using VAS anxiety (VAS: 0–10). 79.9% of the patients declared medium and high levels of preoperative anxiety according VAS. There were no statistically significant differences between the groups. There were differences between high anxiety group and low anxiety regarding maternal weights, p = 0.03, also there were differences between medium anxiety group and low anxiety regarding maternal weights, p = 0.05.

Table 1: Maternal characteristics

	Low anxiety	Medium anxiety	High anxiety
Number/%	33/20.1%	63/38.4%	68/41.5%
Age (year)	30.43 ± 4.75	30.41 ± 4.99	30.31 ± 4.93
Weight (kg)	76.00 ± 12.19	80.86 ± 11.01	81.97 ± 13.30
Height (cm)	163.94 ± 5.91	165.0 ± 3.81	165.07 ± 3.93
Gestational age (weeks)	39.07 ± 0.77	39.06 ± 0.79	39.20 ± 0.85
Parity	1.41 ± 0.49	1.61 ± 0.58	1.66 ± 0.70

Data are presented as mean ± SD (standard deviation)

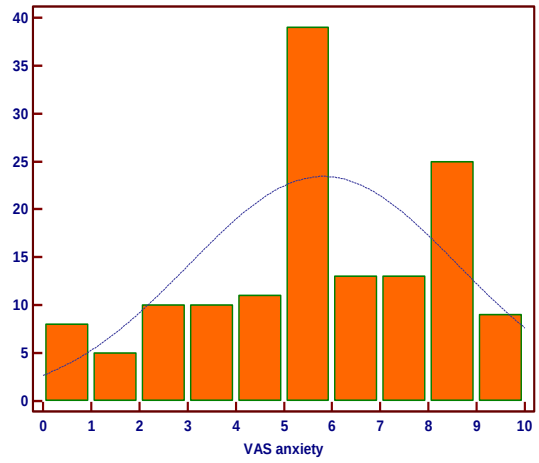

Figure 1: The distribution of the patients according to the VAS score for preoperative anxiety

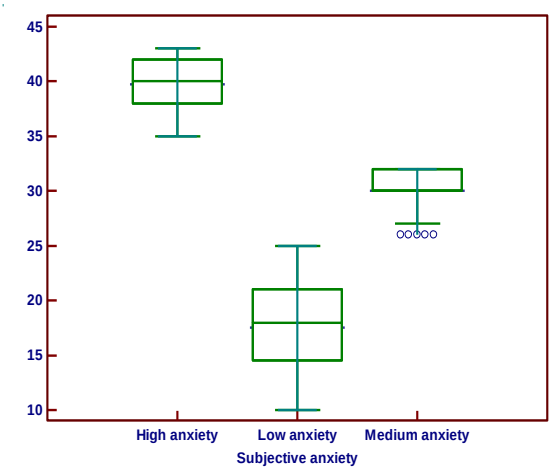

Figure 2: The effect of preoperative subjective anxiety (VAS 0-10) on the maximal % change in systolic blood pressure. Error bars represent 95% CI of the mean

In the figure 1 is presented the distribution of the patients according to the VAS score for preoperative anxiety.

The effect of low, medium, and high preoperative anxiety on the maximal % change and on the maximal absolute change

in systolic blood pressure are represented in Figures 2 and 3.

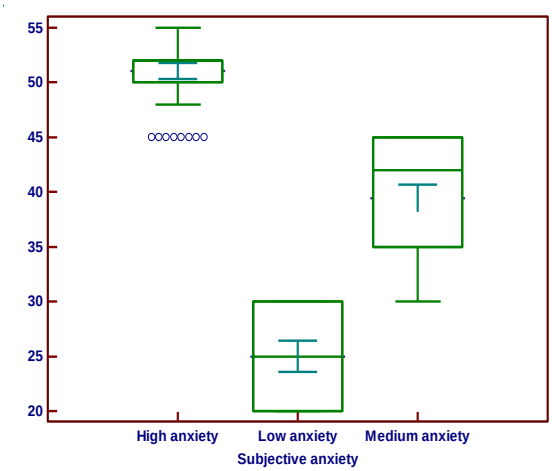

Figure 3: The effect of preoperative subjective anxiety (VAS 0-10) on the maximal absolute change in systolic blood pressure. Error bars represent 95% CI of the mean

When comparing low, medium, and high preoperative anxiety based upon the VAS score, there was a significant effect on the maximal % change of systolic blood pressure after spinal anaesthesia (one-way ANOVA, $P < 0.001$).

There was a significant difference between low medium and high preoperative anxiety groups regarding the mean values of the maximal % change in systolic blood pressure after spinal anesthesia. Mean values of the maximal % change in systolic blood pressure after spinal anesthesia were:

Low anxiety group: 17.54 (95% CI for the mean: 15.99-19.09)

Medium anxiety group: 30.04 (95% CI for the mean: 29.53-30.56)

High anxiety group: 39.72 (95% CI for the mean: 39.19-40.24).

The maximal absolute change in systolic blood pressure after spinal anaesthesia was significantly affected by preoperative anxiety assessed by VAS (one-way ANOVA, $P < 0.001$). There was a significant difference between low medium and high preoperative anxiety groups regarding the mean values of the maximal absolute change in systolic blood pressure after spinal anesthesia. Mean values of the maximal absolute change in systolic blood pressure after spinal anesthesia were:

Low anxiety group: 25.0 (95% CI for the mean: 23.59-26.40)

Medium anxiety group: 39.44 (95% CI for the mean: 38.20-40.68)

High anxiety group: 51.02 (95% CI for the mean: 50.30-51.75).

There were no differences in neonatal outcomes for Apgar score at 1 minute and Apgar score at 5 minute in the three groups.

DISCUSSION

In this study is showed that increased preoperative anxiety in patients undergoing spinal anesthesia for cesarean delivery results in a greater reduction in systolic blood pressure.

Our results support the finding that a simple subjective preoperative anxiety score may predict hypotension after spinal anaesthesia. [13] Preoperative anxiety is associated with an anxiety-mediated increase in baseline sympathetic activation, and as hypotension induced by spinal anaesthesia is mediated by sympatholysis, the higher the baseline sympathetic activation, the more dramatic will be the haemodynamic effect of spinal anaesthesia. [13]

In other studies, it has been reported that patients having high levels of anxiety before the operation, have high levels of anxiety and sleep disorders postoperatively, encounter more medical complications, more analgesic usage and longer hospital stay. [14]

In our study, we have used a subjective test: VAS for the evaluation of preoperative anxiety. VAS is well correlated with other anxiety tests; it is comparable with Amsterdam Preoperative Anxiety and Information Scale, and also with the gold standard test STAI. [15,16]

Badner et al. have reported that anaesthesiologists are inadequate for evaluating patient anxiety and they are actually able to lessen it by simply questioning the patients. [17]

Meeting the patients with the anesthesiologist and the surgeon before the

operation, giving information and ensuring that it is understood by the patient is the duty of anesthetist.

However, while assessing the patient before the anesthesia, the understanding of this information by the patient during preanaesthetic assessment could not always be provided.

But, lessening preoperative patient anxiety could make having better results after the operation and improve anesthetic satisfaction. [18] Giving the patients the information of the procedures can result in decrease of the anxiety. [6,19] The most effective approach in the anxiety patient is giving psychological support and assurance. [20]

Limitations of the study: we have used only VAS anxiety test to evaluate preoperative anxiety of the patients, which is a subjective test, but other objective tests are available. We don't have their availability in our clinical practice. We have not assessed the effect of preoperative anxiety on postoperative pain; therefore other studies should be performed on this subject.

CONCLUSION

In conclusion, we found that preoperative anxiety, assessed by a simple subjective VAS score, had a significant effect on hypotension after spinal anesthesia for cesarean delivery. Anaesthesiologist may contribute on decreasing anxiety in the patients before operation giving psychological support and assurance, also giving adequate information about the procedures and their possible complications.

REFERENCES

1. G. Edward Morgan, Maged S Mikhail, Michael J Murray. Maternal and fetal Physiology and anesthesia. Clinical anesthesiology. Lange Medical Books/ McGraw-Hill, 2006. 4th ed: 874-890.
2. Clark RB, Thompson DS, Thompson CH. Prevention of spinal hypotension associated with cesarean section. Anesthesiology 1976; 45:670–674.
3. Macarthur A, Riley ET. Obstetric anesthesia controversies: vasopressore of choice for post spinal hypotension during cesarean delivery. Int Anesthesiol Clin 2007; 45:115–32.
4. Rocke DA, Rout CC. Volume preloading spinal hypotension and caesarean section. Br J Anaesth 1995; 75:257-297.
5. Rout CC, Rocke DA. Prevention of hypotension following spinal anesthesia for cesarean section. Int Anesthesiol Clin 1994; 32:117-35.
6. Jlala Ha, French JL, Foxall GL, Hardman JG, Bed forth NM. Effect of preoperative multimedia information on perioperative anxiety in patients undergoing procedures under regional an aesthesia. Br J Anaesth 2010; 104: 369-374.
7. Mercier FJ, Bonnet MP, De la Dorie A, Moufouki M, Banu F, Hanaf A, Edouard D, Roger-Christoph S. Spinal an aesthesia for caesarean section: fluid loading, vasopressors and hypotension. Ann Fr Anesth Reanim. 2007; 26:688–693.
8. Roth W, Dobrenz S, Dietal A, et al. Sympathetic activation in broadly defined generalized activation anxiety disorder. J Psychiatr Res 2008; 42: 205–12.
9. Hanss R, Bein B, Ledowski T, et al. Heart rate variability predicts severe hypotension after spinal anesthesia for elective Caesarean delivery. Anesthesiology 2005; 102: 1086–93.
10. Hanss R, Ohnesorge H, Kaufmann M, et al. Changes in heart rate variability may reflect sympatholysis during spinal anaesthesia. Acta Anaesthesiol Scand 2007; 51: 1297–304.
11. Kindler CH, Harms C, Amsler F, Ihde-Scholl T, Scheidegger D. The visual analog scale allows effective measurement of preoperative anxiety and detection of patients' anesthetic concerns. Anesth Analg 2000; 90: 706–12.
12. Hall PA, Bennett A, Wilkes MP, Lewis M. Spinal an aesthesia for caesarean section: comparison of infusions of phenylephrine and ephedrine. Br J Anaesth 1994; 73:471–4.

13. S. Orbach-Zinger, Y. Ginosar, J. Elliston, C. Fadon, M. Abu-Lil, A. Raz, Y. Goshen-Gottstein and L. A. Eidelman. Influence of preoperative anxiety on hypotension after spinal anaesthesia in women undergoing Caesarean delivery. British Journal of Anaesthesia. BJA Advance Access published September 10, 2012. doi:10.1093/bja/aes313.
14. Granot M, Ferber SG. The roles of pain catastrophizing and anxiety in the prediction of postoperative pain intensity: a prospective study. Clin J Pain 2005; 21: 439-445.
15. Hicks JA, Jenkins JG. The measurement of preoperative anxiety. J R Soc Med 1988; 81:517-519.
16. Boker A, Brownell L, Donen N. The Amsterdam preoperative anxiety and information scale provides a simple and reliable measure of preoperative anxiety. Can J Anaesth 2002; 49:792-798.
17. Badner NH, Nielson WR, Munk S, Kwiatkowska C, Gelb AW. Preoperative anxiety: detection and contributing factors. Can J Anaesth 1990; 37:444-447.
18. Lee A, Gin T. Educating patients about an aesthesia: effect of various modes on patient's knowledge, anxiety and satisfaction. Curr Opin Anaesthesiol 2005; 18:205-208.
19. Doering S, Katzlberger F, Rumpold G, Roessler S, Hofstoetter B, Schatz DS, Behensky H, Krismer M, Luz G, Innerhofer P, et al. Videotape preparation of patients before hip replacement surgery reduces stress. Psychosom Med 2000; 62:365-373.
20. G. Edward Morgan, Maged S Mikhail, Michael J Murray. Obstetric anesthesia. Clinical anesthesiology. Lange Medical Books/McGraw-Hill, 2006. 4th ed: 890-922.

How to cite this article: Soxhuku (Isufi) A, Misja A, Shpata V et al. The role of maternal preoperative anxiety on hypotension after spinal anaesthesia in caesarean delivery. Int J Health Sci Res. 2016; 6(4):118-123.

****