

Preference of Anaesthesia for Caesarean Sections; Spinal or General??

Ajay Batra¹

ABSTRACT

Background: One of the most frequent operative procedures performed in United States is the Caesarean section. Associated risks of maternal mortality and side-effects have been shown to be lower in cases of SA in comparison with the GA. However; still a lot of controversy exists regarding the negative or positive effects of spinal anaesthesia on the post-surgical analgesic effects in mothers undergoing caesarean sections. Hence; we evaluated and compared the adverse effects of SA in comparison with GA during caesarean operations.

Material and methods: The present study was conducted in the department of gynaecology of the institution and included 100 patients who were admitted in the hospital and underwent caesarean section. All the patients were divided broadly into two study groups; Group 1 and Group 2. Group 1 included patients who underwent caesarean section under GA and Group 2 included patients who underwent caesarean section under SA. Post-surgical symptoms were noticed and evaluated based on the questionnaires filled by the patients. Various side-effects after surgery were noted which included various clinical signs and symptoms like nausea, vomiting, headache, pain and other clinical symptoms. SPSS software was used for the assessment of the results.

Results: Before surgery, mean WBCs ($\times 10^9/L$) concentrations in patients undergoing GA and SA was 9.85 and 9.92 respectively. Mean RBCs ($\times 10^9/L$) concentrations were 4.12 and 4.18 in patients undergoing GA and SA respectively before surgery. Non-significant results were obtained while comparing the mean WBC concentration, mean RBC concentration, mean haemoglobin and other haematological parameters in between the two study groups before the surgery. After surgery, mean WBCs ($\times 10^9/L$) concentrations in patients undergoing GA and SA was 12.21 and 10.41 respectively. Statistically significant differences were obtained while comparing the mean WBC concentration in the two study groups when measured after the surgery. Pain and hypotension was the most common side effect prevalent in patients undergoing caesarean sections under both GA and SA.

Conclusion: Milder side-effects are seen in patients undergoing SA and alterations of haematological parameters are associated with GA patients.

Keywords: Anaesthesia, Caesarean, General, Spinal

INTRODUCTION

One of the most frequent operative procedures performed in United States (US) is the Caesarean section reaching a level of more than 25 % of the total surgeries performed in US and more than 20 percent on Germany.^{1,2} Associated risks of maternal mortality and side-effects have been shown to be lower in cases of spinal anaesthesia (SA) in comparison with the general anaesthesia (GA). Therefore, for balancing the pros and cons of the caesarean surgeries in relation to mother and her foetus, spinal anaesthesia should be preferred. Because of some selective advantages provided by SA over epidural anaesthesia, SA is preferred nowadays for performing elective caesarean sections.^{3,4} However; still a lot of controversy exists

regarding the negative or positive effects of spinal anaesthesia on the post-surgical analgesic effects in mothers undergoing caesarean sections.^{5,6} Hence; we evaluated and compared the adverse effects of SA in comparison with GA during caesarean operations.

MATERIAL AND METHODS

The present study was conducted in the department of gynaecology of the institution and included all the patients who were admitted in the hospital and underwent caesarean section from 2012 to 2014. A total of 100 patients were included in the present study. All the patients were divided broadly into two study groups; Group 1 and Group 2. Group 1 included patients who underwent caesarean section under general anaesthesia (GA) and Group 2 included patients who underwent caesarean section under spinal anaesthesia (SA). Division of the patients in the two study groups was subjected to randomized blind trials irrespective of the age and other clinical and demographic details of the patients. Pre-operative assessment of the haematological parameters was done. Access was obtained into the venous blood of the patients by making venipuncture and assessment of haemoglobin concentration, red blood cell count and other haematological parameters was done. Caesarean section was performed in both the groups in GA or SA. Post-surgical symptoms were noticed and evaluated based on the questionnaires filled by the patients. This questionnaire included assessment of various side effects post-surgically in the patients undergoing caesarean section. Various side-effects after surgery were noted which included various clinical signs and symptoms like nausea, vomiting, headache, pain and other clinical symptoms. All the records were noted and were subjected to statistical analysis. SPSS software was used for the assessment of the results. Chi-square test and student t test was used for evaluation of level of significance.

RESULTS

Figure 1 shows the haematological parameters of the patients in the two study groups before surgery. Before surgery, mean WBCs ($\times 10^9/L$) concentrations in patients undergoing GA and SA was 9.85 and 9.92 respectively. Mean RBCs ($\times 10^9/L$) concentrations were 4.12 and 4.18 in patients undergoing GA and SA respectively before surgery. Mean Haemoglobin (g/dL) in the patients before surgery was 13.11 and 12.12 in GA and SA respectively. Table 1 highlights p-value for the haematological parameters of the patients in the two study groups before the

¹Associate Professor, Department of General Anesthesia, Narayan Medical College and Hospital, Rohtas

Corresponding author: Ajay Batra, Associate Professor, Department of General Anesthesia, Narayan Medical College and Hospital, Rohtas

How to cite this article: Ajay Batra. Preference of anaesthesia for caesarean sections; spinal or general??. International Journal of Contemporary Medical Research 2016;3(10):2835-2837.

Parameter	p-value
Mean WBCs (x 10 ⁹ /L)	NS
Mean RBCs (x 10 ⁹ /L)	NS
Mean Haemoglobin (g/dL)	NS
Mean Platelet count (x 10 ⁹ /L)	NS

Table-1: p-value for the haematological parameters of the patients in the two study groups before the surgery.

Parameter	p-value
Mean WBCs (x 10 ⁹ /L)	S
Mean RBCs (x 10 ⁹ /L)	NS
Mean Haemoglobin (g/dL)	NS
Mean Platelet count (x 10 ⁹ /L)	NS

Table-2: p-value for the haematological parameters of the patients in the two study groups after surgery

surgery. Non-significant results were obtained while comparing the mean WBC concentration, mean RBC concentration, mean haemoglobin and other haematological parameters in between the two study groups before the surgery. Figure 2 shows the haematological parameters of the patients in the two study groups after surgery. After surgery, mean WBCs (x 10⁹/L) concentrations in patients undergoing GA and SA was 12.21 and 10.41 respectively. Statistically significant differences were obtained while comparing the mean WBC concentration in the two study groups when measured after the surgery (Table 2) (p-value < 0.05). All other haematological parameters showed non-significant alterations. Figure 3 shows the percentage of patients having side-effects post-surgically. Pain and hypotension was the most common side effect prevalent in patients undergoing caesarean sections under both GA and SA.

DISCUSSION

For performing caesarean sections, regional anaesthesia is recommended by the international obstetrics anaesthetic guidelines in comparison with general anaesthesia.⁷ Higher risk of failure of endotracheal intubation and greater chances of aspiration of gastric contents in patients undergoing caesarean sections under GA comparison to SA is one of the prime reasons for such guidance.^{8,9} Although, higher need for neonatal resuscitation is required in patients undergoing GA, data regarding the various outcomes, prognosis and adverse effects regarding the same is very limited.¹⁰ Since, the incidence and frequency of caesarean patients increasing very fast worldwide, special attentions is paid nowadays on the prognosis and outcomes of such procedures. For performing caesarean section, GA or SA both is the procedures of choice. However, both the methods are associated with certain advantages and certain limitations. Some amount of controversy do exist regarding the selection of SA as the method of choice for performing caesarean sections despite the fact that for performing such procedures in today’s scenario, regional anaesthesia is the procedure of choice.^{11,12} Hence; we evaluated and compared the adverse effects of SA in comparison with GA during caesarean operations.

In the present study, we observed that negligible cases in patients undergoing SA showed presence of fever while considerable people in GA group showed fever. This may be due to path of administration in cases of GA. In both the study groups,

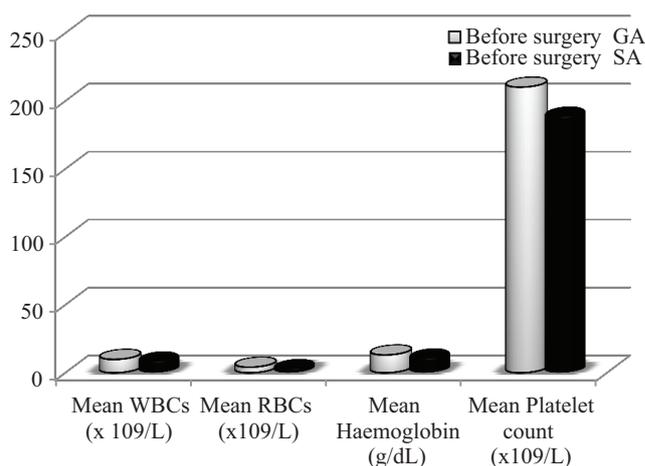


Figure-1: Haematological parameters of the patients in the two study groups before surgery

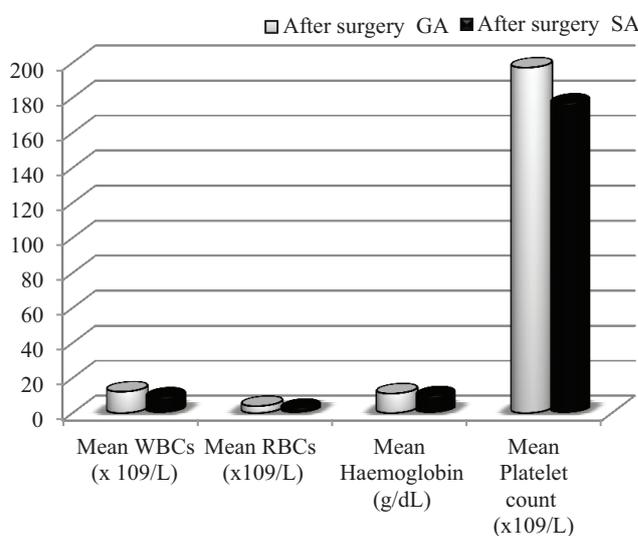


Figure-2: Haematological parameters of the patients in the two study groups after surgery

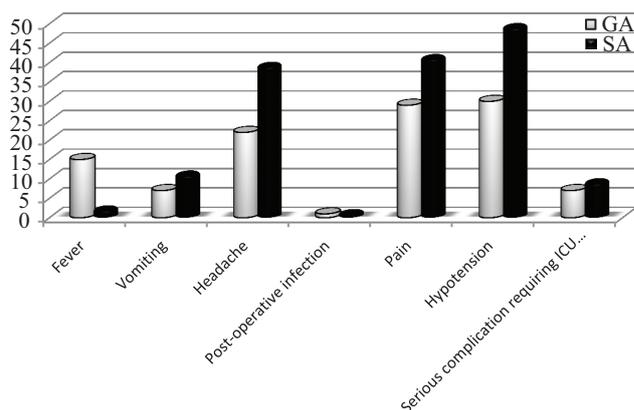


Figure-3: Percentage of patients having side-effects post-surgically

headache was a common finding but was found to be in higher percentage in patients undergoing spinal anaesthesia. Schewe et al investigated the impact of spinal or epidural anaesthesia on post-surgical symptoms of pain. They compared and evaluated over 130 females who underwent elective caesarean surgeries and divided randomly them into two study groups. One group included patients who were given spinal anaesthesia and the other group included patients which were given epidural

anaesthesia. They observed no statistically significant difference in the post-surgical requirements of analgesic in between the two study groups. However, they observed a lower area under the curve of pain for the patients under the spinal anaesthesia group. From the results, they concluded that effect of ropivacaine is similar after both spinal and epidural anaesthesia in patients undergoing elective caesarean section.¹³ Veneziani compared and reviewed the data to evaluate the effect of spinal and epidural anaesthesia in patients undergoing caesarean section. During the caesarean sections, reduction in the mortality rate of the patients undergoing regional anaesthesia is observed to be directly related to the level of anaesthesia. When performed during labour, good results are seen in cases performed under epidural anaesthesia.¹⁴ Kaya et al compared and evaluated the effect of ropivacaine and ropivacaine with sufentanil in patients undergoing controlled epidural analgesia. They evaluated 50 patients who underwent combined spinal-epidural anaesthesia and divided them into two study groups with 25 patients in each group. They didn't observe any significant difference in between two study groups regarding demographic parameters. However, significant difference was observed in between their study groups regarding the motor block and mean pain scores.¹⁵ Stamer et al conducted a questionnaire based survey to assess the type of anaesthetic practice for caesarean cases in US and other European countries. They framed a list of questionnaires and gave it to various clinicians practicing caesarean operations in various obstetric units in over 1000 tertiary care centres and various health care settings. They observed that more than 45 percent of the population replied and filled the questionnaires thereby completing the survey. More than 40 percent of the total hospitals included in their study had a delivery rate of between 500 and 1000. The most frequent type of anaesthesia technique for elective and emergency caesarean sections was found to be GA. From the results, they concluded that for performing caesarean sections, German anaesthesiologists prefer giving GA.¹⁶ Bakri et al compared and evaluated the prognosis and outcomes of SA and GA in patients undergoing caesarean sections. They evaluated 40 patients who were underwent elective caesarean sections and divided them randomly into two study groups. One group included patients who underwent SA while other group included patients who underwent GA. A significantly higher blood loss was noticed in patients undergoing caesarean sections under GA as compared to patients undergoing SA. From the result, they concluded that SA do offers certain advantages in various clinical parameters in comparison with GA in patients undergoing caesarean sections.¹⁷

CONCLUSION

From the above results, it can be concluded that while on one hand, milder side-effects are seen in patients undergoing SA, alterations of haematological parameters is associated with GA. Hence; a clinician must evaluate all the clinical and haematological parameters in depth to choose the type of anaesthesia.

REFERENCES

1. Gaiser RR. Changes in the provision of anesthesia for the parturient undergoing cesarean section. *Clin Obstet Gynecol.* 2003;46:646-656.
2. Martin JA, Hamilton BE, Sutton PD, et al. Births: final data

- for 2003. *Natl Vital Stat Rep.* 2005;54:1-116.
3. Stamer UM, Wiese R, Stuber F, et al. Change in anaesthetic practice for Caesarean section in Germany. *Acta Anaesthesiol Scand.* 2005; 49:170-176.
4. Stamer U, Schneck H, Grond S, Wulf H. Surveys on the use of regional anaesthesia in obstetrics. *Curr Opin Anaesthesiol.* 1999;12:565-571.
5. Ng K, Parsons J, Cyna AM, Middleton P. Spinal versus epidural anaesthesia for caesarean section. *Cochrane Database Syst Rev* 2004:CD003765.
6. Practice guidelines for obstetrical anesthesia: a report by the American Society of Anesthesiologists Task Force on Obstetrical Anesthesia. *Anesthesiology.* 1999;90:600-611.
7. Riley ET, Cohen SE, Macario A, et al. Spinal versus epidural anesthesia for cesarean section: a comparison of time efficiency, costs, charges, and complications. *Anesth Analg.* 1995;80:709-712.
8. Solangi SA, Siddiqui SM, Khaskheli MS, Siddiqui MA. Comparison of the effects of general vs spinal anesthesia on neonatal outcome. *Anaesth Pain Intens Care.* 2012; 16:18-23.
9. Afolabi BB, Lesi FE. Regional versus general anaesthesia for caesarean section. *Cochrane Database Syst Rev.* 2012; 10:CD004350.
10. Lemke KA, Runyon CL, Horney BS. Effects of preoperative administration of ketoprofen on whole blood platelet aggregation, buccal mucosal bleeding time, and hematologic indices in dogs undergoing elective ovariohysterectomy. *J Am Vet Med Assoc.* 2002;220: 1818-1822.
11. Khalaf FH, AL-Zuhairi AH, Al-Mutheffer EA. Clinical and hematological effect of Acepromazine, Midazolam, Ketamine as general anesthesia protocol in rabbits. *International Journal of Science and Nature.* 2014;5:328-331.
12. Ong BY, Cohen MM, Palahniuk RJ. Anesthesia for caesarean section--effects on neonates. *Anesth Analg.* 1989;68:270-275.
13. Schewe JC, Komusin A, Zinserling J, Nadstawek J, Hoefft A, Hering R. Effects of spinal anaesthesia versus epidural anaesthesia for caesarean section on postoperative analgesic consumption and postoperative pain. *Eur J Anaesthesiol.* 2009;26:52-9.
14. Veneziani A, De Tommaso O. Spinal or epidural anaesthesia for caesarean section? Compared opinions. *Minerva Anesthesiol.* 2001;67(9 Suppl 1):169-74.
15. Kaya T, Büyükkoçak U, Başar H, Sağsöz N. Comparison of epidural ropivacaine 0.2% and ropivacaine 0.2% in combination with sufentanil 0.75 microg mL-1 for postcaesarean analgesia. *Agri.* 2008;20:30-7.
16. Stamer UM, Messerschmidt A, Wulf H. Anaesthesia for caesarean section--a German survey. *Acta Anaesthesiol Scand.* 1998;42:678-84.
17. Bakri MH, Ismail EA, Ghanem G, Shokry M. Spinal versus general anesthesia for Cesarean section in patients with sickle cell anemia. *Korean J Anesthesiol.* 2015;68:469-75.

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 18-08-2016; **Published online:** 30-09-2016