

# Comparison between the Side Effects of Spinal and General Anaesthesia During Caesarean Section

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## Abstract

**Background:** Caesarean section is one of the most commonly performed operation technique throughout the world. General and spinal anaesthesia are the two anaesthetic techniques used during caesarean section. Studies have recorded various advantages and disadvantages of both of these anaesthetic techniques. Therefore, the present study was designed to compare the adverse effects of general anaesthesia and spinal anaesthesia during caesarean operation. **Subjects and Methods:** This study was carried out in the department of anaesthesia of the District Hospital, Datia from January 2018 to July 2018. Study population was divided broadly into two study groups; Group I contained patients who underwent caesarean section under general anaesthesia and Group II included patients who underwent caesarean section under spinal anaesthesia. Blood samples were collected by vein puncture and assessment of haemoglobin concentration, red blood cell count and other haematological parameters was done and data were recorded. Various side-effects after surgery were noted which included various clinical signs and symptoms like nausea, vomiting, headache, pain and other clinical symptoms. **Results:** There was a significant decrease in RBCs, haemoglobin and platelet count after caesarean section in general anaesthesia group compare to spinal anaesthesia group. Nonetheless, there was an insignificant difference between RBCs ( $p>0.05$ ), haemoglobin ( $p>0.05$ ) and platelet count ( $p>0.05$ ) after surgery between both groups. There was fever after operation in 16% patients of group I general anaesthesia while no patient of group II spinal anaesthesia group had fever. Vomiting was observed in 8% patients of group I while 12% patients of group II. Headache and pain were recorded in 24% and 28% general anaesthesia patients while 44% of spinal anaesthesia patients showed both headache and pain. **Conclusion:** Findings of our study showed that general anaesthesia was associated with increase of WBC count, decrease of RBC count, haemoglobin and platelet count. On the other hand, side effects of spinal anaesthesia like vomiting, pain, headache were greater compare to general anaesthesia. Each technique of anaesthesia has its own advantages and disadvantages. Therefore, we recommend that the clinician should decide the type of anaesthesia technique on the basis of haematological and clinical parameters of the patients.

**Keywords:** General anaesthesia, spinal anaesthesia, caesarean section, adverse effects.

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## Introduction

Caesarean section is one of the most commonly performed operation technique throughout the world.<sup>[1,2]</sup> An incredible increase of caesarean sections have been recorded in last few decades.<sup>[3]</sup> Caesarean section is most likely performed for nonmedical reasons escorting to in general overuse of this surgical technique. Moreover, repeat caesarean section and elective primary caesarean section heavily contributed to the increase number of caesarean section now a day.<sup>[4]</sup> Increase use of caesarean section is globally seeking attention for the outcomes of this surgical procedure. General and spinal anaesthesia are the two anaesthetic techniques used during caesarean section. Studies have recorded various advantages and disadvantages of both of these anaesthetic techniques. Spinal anaesthesia is the anaesthetic technique of choice over general anaesthesia. However, use of either anaesthetic technique during caesarean section varies from country to

country and region to region.<sup>[5,6]</sup>

A combination of drugs injected while gases are breathe in a carefully controlled way to induce the general anaesthesia. However, less commonly used general anaesthesia compare to regional anaesthesia; it is considered a safe technique of anaesthesia.<sup>[7]</sup> A single injection of drug is injected to induce the spinal anaesthesia before caesarean section which rapidly and completely blocks the nerves for up to three hours.<sup>[8]</sup> 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).<sup>[9,10]</sup> Therefore, the present study was designed to compare the adverse effects of general anaesthesia and spinal anaesthesia during caesarean operation.

## Subjects and Methods

This study was carried out in the department of anaesthesia of the District Hospital, Datia from January 2018 to July 2018 and was performed on all the patients who were

admitted in the hospital and underwent caesarean section during that period. In the present study, a total of 100 patients were covered up and divided broadly into two study groups; Group I and Group II. Group I contained patients who underwent caesarean section under general anaesthesia and Group II included patients who underwent caesarean section under spinal anaesthesia. All the contributors were selected randomly despite their age, clinical condition or nationality. Ethical approval was taken from participants who accepted to sign the consent of approval to participate in this study. The proposal of this research was submitted and approved by the ethical committee of the institution. Assessment of the haematological parameters was done prior to the operation. Blood samples were collected by vein puncture and assessment of haemoglobin concentration, red blood cell count and other haematological parameters was done and data were recorded. Caesarean section was performed in both the groups in General anaesthesia or Spinal anaesthesia. Symptoms were observed and evaluated after the operation. This evaluation was based on the questionnaires filled by the patients which also included assessment of various side effects in the patients who underwent caesarean section after the surgery. 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 were used for evaluation of the level of significance.

## Results

The results of present study included various haematological parameters of hundred patients which were divided under two groups; group I consisted the patients of caesarean section with general anaesthesia while group II included caesarean section patients with spinal anaesthesia. All the patients belong to between 21 to 44 years age group. The mean age of group I patients was  $29.6 \pm 6.2$  years while group II patients was  $30.2 \pm 5.4$  years. The patients of group I (38/ 50) decided the general anaesthesia themselves as most of them were going for caesarean section first time. On the other hand, doctors decided most of the spinal anaesthesia patients (44/ 50).

[Table 1] show that there was an insignificant difference between the TWBCs, RBCs, Haemoglobin and Platelets count in both groups before surgery. Further, an insignificant different was observed between systolic blood pressure ( $p>0.05$ ) and diastolic blood pressure ( $p>0.05$ ) of both groups. On the other hand, results after caesarean section showed that there was a significant increase in leucocytes count of general anaesthesia patients ( $p<0.05$ ) compare to spinal anaesthesia patients after surgery. There was a significant decrease in RBCs, haemoglobin and platelet count after caesarean section in general anaesthesia group compare to spinal anaesthesia group. Nonetheless,

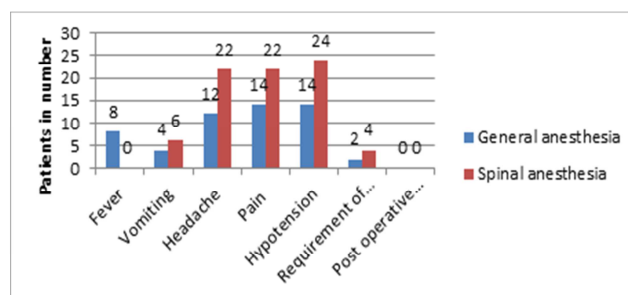
there was an insignificant difference between RBCs ( $p>0.05$ ), haemoglobin ( $p>0.05$ ) and platelet count ( $p>0.05$ ) after surgery between both groups. Pre and post-operative systolic blood pressure and diastolic blood pressure showed an insignificant difference between group I general anaesthesia patients and group II spinal anaesthesia patients. [Table 2]

**Table 1: Difference between haematological variables among spinal and general anaesthesia patients before caesarean section.**

Variable	Before surgery	Before surgery	P value
	General anaesthesia	Spinal anaesthesia	
TWBCs ( $\times 10^9/L$ )	$9.74 \pm 2.24$	$9.8 \pm 2.5$	$>0.05$
RBCs ( $\times 10^{12}/L$ )	$4.12 \pm 0.41$	$4.09 \pm 0.38$	$>0.05$
Haemoglobin (g/L)	$11.8 \pm 2.6$	$11.35 \pm 1.792$	$>0.05$
Platelets count ( $\times 10^9/L$ )	$205.12 \pm 58.32$	$198.4 \pm 52.4$	$>0.05$
Systolic blood pressure	$124.2 \pm 10.12$	$126.4 \pm 18.3$	$>0.05$
Diastolic blood pressure	$84.22 \pm 9.4$	$85.6 \pm 10.9$	$>0.05$

**Table 2: Difference between haematological variables among spinal and general anaesthesia patients before caesarean section.**

Variable	After surgery	After surgery	P value
	General anaesthesia	Spinal anaesthesia	
TWBCs ( $\times 10^9/L$ )	$11.76 \pm 2.86$	$10.32 \pm 2.52$	$<0.05^*$
RBCs ( $\times 10^{12}/L$ )	$3.8 \pm 0.44$	$3.92 \pm 0.37$	$>0.05$
Haemoglobin (g/L)	$10.24 \pm 1.64$	$10.82 \pm 1.7$	$>0.05$
Platelets count ( $\times 10^9/L$ )	$194.28 \pm 59.45$	$196.4 \pm 52.7$	$>0.05$
Systolic blood pressure	$111.88 \pm 14.72$	$110.92 \pm 16.9$	$>0.05$
Diastolic blood pressure	$78.4 \pm 11.3$	$80.8 \pm 10.6$	$>0.05$



**Figure 1: Side effects of anaesthesia in both groups.**

[Figure 1] shows that there was fever after operation in 16% patients of group I general anaesthesia while no patient of group II spinal anaesthesia group had fever. Vomiting was observed in 8% patients of group I while 12% patients of group II. Headache and pain were recorded in 24% and 28% general anaesthesia patients while 44% of spinal anaesthesia patients showed both headache and pain. ICU was required for 8% patients and 4% patients of group II and group I

respectively. Postoperative infection was not observed in any patients of either group.

## Discussion

Studies suggested that spinal anaesthesia should be preferred instead of general anaesthesia for the caesarean sections.<sup>[11,12]</sup> Moreover, the risk of aspiration of gastric contents and failure of endotracheal intubation have been found associated with general anaesthesia compare to spinal anaesthesia.<sup>[11-13]</sup> There are few controversy also has been found associated with spinal anaesthesia. However, both of these anaesthesia techniques have their own advantages as well as disadvantages.<sup>[14,15]</sup> In this study general anaesthesia was given to the patients who were first time going for caesarean section. Further, general anaesthesia may be used in the patients in whom it is difficult to induce spinal anaesthesia.<sup>[16]</sup> Most of the first time caesarean section patients received general anaesthesia instead of spinal anaesthesia. However, patients of second or further caesarean section preferred spinal anaesthesia. This may be due to false believes in patients of first time caesarean section that spinal anaesthesia may cause the paralysis in them.<sup>[10]</sup>

Results of our study showed that there was a significant increase in total leucocytes count of general anaesthesia group compare to spinal anaesthesia group. These findings are similar to the findings of the previous study of Khalaf HF et al,<sup>[15]</sup> and Ismail ZB et al,<sup>[17]</sup> as they observed significant increase of total WBC count in general anaesthesia patients in comparison of spinal anaesthesia patients.

This increase of WBCs may be due to direct introduction of general anaesthesia agent to the blood counter increase of WBC. It is considered as one of the commonest side effects of general anaesthesia.<sup>[14]</sup> Further, studies suggest that different anaesthetic agents have different effects on total leucocytes count.<sup>[15,17]</sup>

Red blood cells count and haemoglobin was found significantly decreased after caesarean section in general anaesthesia patients. However, there was an insignificant difference in post-operative RBCs and haemoglobin of both groups. These findings are very similar with the results of the previous study Ismail ZB et al,<sup>[17]</sup> as they recorded significant decrease of RBCs and haemoglobin in general anaesthesia patients. This decrease of RBCs and haemoglobin in general anaesthesia group may be due direct introduction of general anaesthetic agent in blood.

In the current study we have recorded that fever after caesarean section in 8 patients of general anaesthesia while no patient of spinal anaesthesia group made complaint of fever. Further, there was no significant difference between the post-operative pain and vomiting of both groups. These findings are consistent with the previous study of Schewe JC et al,<sup>[18]</sup> as they recorded an insignificant difference in post-operative pain and vomiting between general anaesthesia group and spinal anaesthesia group.

This high incident of fever in general anaesthesia group compare to no fever in spinal anaesthesia group might be due to path of general anaesthesia administration. Though, infections are rare during anaesthetic process. These incidences of infection may be due to contamination during the caesarean section as sterile apparatus are used for anaesthetic procedure and they are of single use. Nevertheless, risk of infection cannot be eliminated totally as most common location of infections is spinal cord and injection site.<sup>[19]</sup>

Headache and pain were recorded in both group patients in the present study. However, incident of pain and headache was more common in spinal anaesthesia group compare to general anaesthesia group. These results are in agreement with the findings of previous study of Schewe JC et al,<sup>[18]</sup> and Solang SA et al,<sup>[12]</sup> recorded similar significant difference in post-operative pain and headache in both anaesthetic groups. This high incidence of pain and headache in spinal anaesthesia group might be due to spinal injection induce pain in head which may be resolve within a week.<sup>[12]</sup> Further, studies suggest that pain and headache are commonly associated with spinal anaesthesia compare to general anaesthesia. Moreover, these pain and headache in spinal anaesthesia patients may sometimes lead to temporary deafness.<sup>[13]</sup>

Long term decrease of blood pressure during caesarean section might be a potential threat for the baby as well as mother.<sup>[20]</sup> There was an insignificant decrease of blood pressure recorded in both groups and the difference of systolic blood pressure and diastolic blood pressure between both groups was none significant.

## Conclusion

Findings of our study showed that general anaesthesia was associated with increase of WBC count, decrease of RBC count, haemoglobin and platelet count. On the other hand, side effects of spinal anaesthesia like vomiting, pain, headache were greater compare to general anaesthesia. Each technique of anaesthesia has its own advantages and disadvantages. Therefore, we recommend that the clinician should decide the type of anaesthesia technique on the basis of haematological and clinical parameters of the patients.

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