

Spinal anesthesia versus general anesthesia in cesarean section

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Abstract:

Background: Caesarean section (CS) is now one of the most commonly performed major operations in women throughout the world. The present study was conducted to compare spinal anesthesia with general anesthesia in cesarean section. **Materials & Methods:** 80 pregnant women were divided into 2 groups of 40 each. Parameters such as haematological, post-surgical symptoms were recorded. Clinical symptoms and side-effects were also noted. **Results:** The mean hemoglobin level in group I was 9.4 and in group II was 9.6, mean platelet count was $2.7 \times 10^9/L$ and $2.4 \times 10^9/L$, mean WBC count in group I was $12.8 \times 10^9/L$ and $10.5 \times 10^9/L$ in group II, mean RBCs was $5.7 \times 10^9/L$ and $5.3 \times 10^9/L$ in group I and II respectively. The difference was significant ($P < 0.05$). Complication was fever in 5 and 7, vomiting in 3 and 5, headache in 4 and 2, hypotension in 3 and 6, pain in 3 and 2 and post-operative infection in 2 and 4 in group I and II respectively. The difference was non-significant ($P > 0.05$). **Conclusion:** The choice of technique should be done considering clinical factors. Both spinal anesthesia and general anesthesia showed variations in hematological parameters.

Key words: Cesarean section, spinal anesthesia, Hypotension

Introduction

Caesarean section (CS) is now one of the most commonly performed major operations in women throughout the world. While regional or general anaesthesia (GA) are both acceptable for caesarean delivery, use of GA has decreased dramatically in the past few decades due to a higher risk of anaesthesia-related maternal mortality.¹ As a consequence, spinal anaesthesia (SA) is now the technique of choice for CS.² Although SA is generally well tolerated, it is still associated with considerable side effects, the most common of which is maternal hypotension, potentially endangering both mother and child. Although both general and spinal anesthesia are used in elective cases of CS, the latter is much preferred, particularly when they need to keep mother awake. Besides, mother aspiration and fetal distress would effectively reduce by spinal technique.³

The two types of regional anesthesia used for cesarean sections are spinal and epidural anesthesia. The advantages of regional anesthesia include reduced complications associated with general anesthesia and promotion of initial bonding between the mother and the baby (because the mother is

awake during the operation).⁴ Recently, spinal anesthesia has been preferred over epidural anesthesia for cesarean section because of its rapid onset, effectiveness, and lower requirement for local anesthetics; however, it is associated with a higher incidence of arterial hypotension. Spinal anesthesia using small amounts of local anesthetics is less likely to cause maternal systemic toxicity or total spinal anesthesia.⁵ The present study was conducted to compare spinal anesthesia with general anesthesia in cesarean section.

Materials & Methods

The present study was conducted among 80 pregnant women with American Society of Anaesthesiologists' (ASA) physical status I or II scheduled for elective cesarean section under spinal anesthesia (SA). All patients were informed regarding the study and their written consent was obtained.

Data such as name, age etc. was recorded. Patients were divided into 2 groups of 40 each. Group I received general anesthesia and group II received spinal anesthesia. Caesarean section was performed in both the groups. Parameters such as

haematological, post-surgical symptoms were recorded. Clinical symptoms and side-effects were also noted. Results were subjected to statistical

analysis. P value less than 0.05 was considered significant.

Results

Table I Post operative hematological parameters in both groups

Parameters	Group I	Group II	P value
Mean haemoglobin (g/dL)	9.4	9.6	0.71
Mean platelet count ($\times 10^9/L$)	2.7	2.4	0.92
Mean WBCs ($\times 10^9/L$)	12.8	10.5	0.12
Mean RBCs ($\times 10^9/L$)	5.7	5.3	0.73

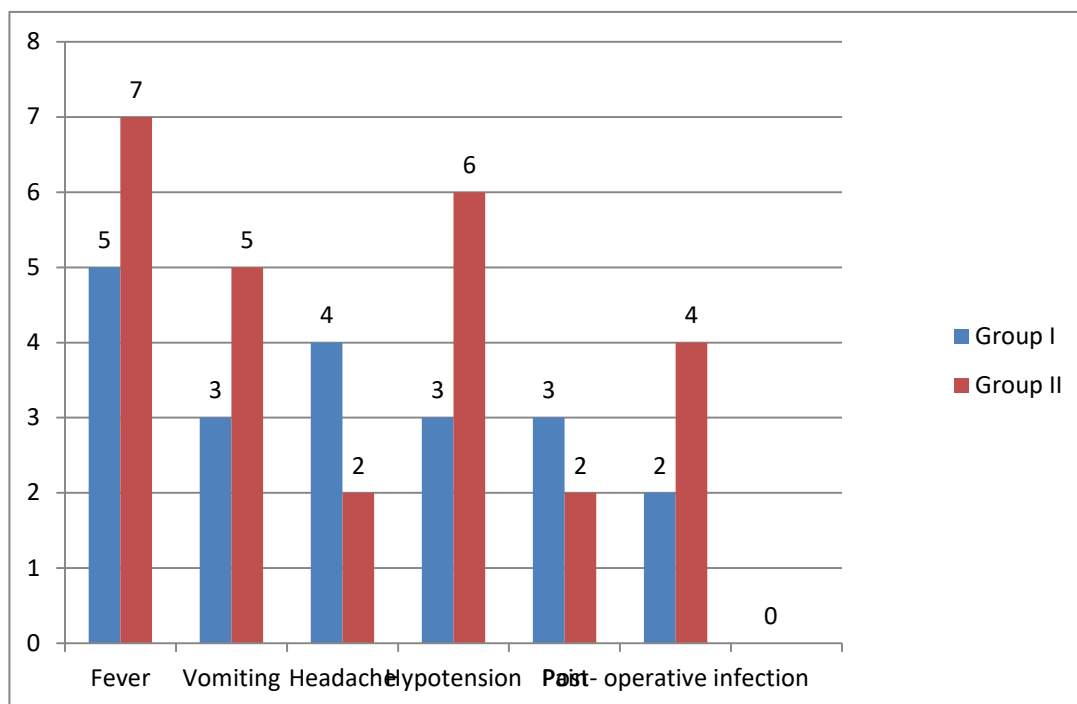
Table I shows that mean hemoglobin level in group I was 9.4 and in group II was 9.6, mean platelet count was $2.7 \times 10^9/L$ and $2.4 \times 10^9/L$, mean WBC count in group I was $12.8 \times 10^9/L$ and $10.5 \times 10^9/L$ in group II, mean RBCs was $5.7 \times 10^9/L$ and $5.3 \times 10^9/L$ in group I and II respectively. The difference was significant ($P < 0.05$).

Table II Assessment of complications

Complications	Group I	Group II	P value
Fever	5	7	0.09
Vomiting	3	5	
Headache	4	2	
Hypotension	3	6	
Pain	3	2	
Post- operative infection	2	4	

Table II, graph I shows that complication was fever in 5 and 7, vomiting in 3 and 5, headache in 4 and 2, hypotension in 3 and 6, pain in 3 and 2 and post- operative infection in 2 and 4 in group I and II respectively. The difference was non- significant ($P > 0.05$).

Graph I Assessment of complications



Discussion

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.⁶ Evidence for maternal death in CS, especially due to excessive bleeding is rare and general anesthesia is not often considered in this regard. This is because of muscle relaxation and much less labor induction against spinal method.⁷ Moreover, inhaled halogen contents in general anesthesia may induce more bleeding via suppression in uterine wall contraction and mother's consciousness.⁸ Studies show a dilemma about labor bleeding and its causes when compare general and spinal anesthesia although the majority of authors determine more bleeding in general technique.^{9,10} The present study was conducted to compare spinal anesthesia with general anesthesia in cesarean section.

We found that mean hemoglobin level in group I was 9.4 and in group II was 9.6, mean platelet count was $2.7 \times 10^9/L$ and $2.4 \times 10^9/L$, mean WBC count in group I was $12.8 \times 10^9/L$ and $10.5 \times 10^9/L$ in group II, mean RBCs was $5.7 \times 10^9/L$ and $5.3 \times 10^9/L$ in group I and II respectively. Veneziani et al¹¹ found that all the elective CS with 38-40 weeks gestational age enrolled via easy sampling before being divided

into two groups of general and spinal anesthesia. Patients' hemoglobin and HCT in addition to blood pressure were the major factors which were checked and compared between the groups. HB fell significantly more in patients with general anesthesia, especially at the range of 1-2 g/dl after 6 and 24 hours of CS. Around 91% of GA and more than 50% of SA had middle changes in HB and HCT. These changes were significantly different between GA and SA. The two groups were simply similar according to greater changes including 2-3 g/dl in HB or 6-9 in HCT and contain a minor part of the patients.

We observed that complication was fever in 5 and 7, vomiting in 3 and 5, headache in 4 and 2, hypotension in 3 and 6, pain in 3 and 2 and post-operative infection in 2 and 4 in group I and II respectively. Ajay¹² in his study found that 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 hemoglobin and other hematological 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.

Sung et al¹³ compared maternal and fetal outcomes between general and spinal anesthesia for cesarean section based on perioperative hemodynamic parameters (pre- and postoperative systolic blood pressure, heart rate), mean difference of hematocrit and estimated blood loss, and neonatal Apgar scores at 1 and 5 min. Postoperative hemodynamic parameters were significantly higher in the general group than the spinal group (systolic blood pressure: 136.8 ± 16.7 vs. 119.3 ± 12.7 mmHg, heart rate: 93.2 ± 16.8 vs. 71.0 ± 12.7 beats/min, respectively, $P < 0.001$). The mean difference between the pre- and postoperative hematocrit was also significantly greater in the general than spinal group ($4.8 \pm 3.4\%$ vs. $2.3 \pm 3.9\%$, respectively, $P < 0.001$). The estimated blood loss was significantly lower in the spinal than general group (819.9 ± 81.9 vs. 856.7 ± 117.9 ml, $P < 0.001$). There was a significantly larger proportion of newborns with 5-min Apgar scores < 7 in the general than spinal group ($6/141$ [4.3%] vs. $0/146$ [0%], respectively, $P = 0.012$).

Conclusion

Authors suggested that the choice of technique should be done considering clinical factors. Both spinal anesthesia and general anesthesia showed variations in hematological parameters.

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