

## Comparison between the Side Effects of Spinal and General Anesthesia during Caesarean Section in Tripoli-Libya

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### Abstract

**Aim of the study:** The present study was aimed to compare the side effects of general vs spinal anesthesia during caesarean operation.

**Materials and methods:** This study was conducted on 50 randomly selected participants. Of them 25 participants referred as case group A (treated with general anesthesia), and 25 participants were referred as case group B (treated with spinal anesthesia). Blood samples were collected before and after the operation to see the differences in WBCs, RBCs, Hemoglobin concentration and platelets count. Blood pressure and body temperature were also measured after operation. Other parameters were collected from patient's thick report or by direct interviewing questionnaire.

**Results:** The mean age of the participants was  $30.52 \pm 4.608$ , majority of them have their first or second caesarean section. 23/25 (92%) of spinal anesthesia was decided with the doctor while 20/25 (80%) of general anesthesia was chosen the patient's themselves. Local pain and headache were clearly observed in spinal anesthesia while vomiting, fever, ICU admission and infection were very rare when using both types of anesthesia. Marked differences were observed in the hemoglobin concentration, RBCs count, WBCs count and platelets count when using the two techniques of anesthesia before and after operation.

In our study, we observed in 40% of participants suffered from pain and 34% suffered from headache after operation in both groups A and B. No remarkable difference was noted on blood pressure range (but some participants have slightly decrease in BP). All participants have slight changes in WBCs, platelets count, RBCs count and Hemoglobin concentration.

**Conclusion:** Differences were observed in the tested parameters between general and spinal anesthesia, and the decision for types of anesthesia was made according to patient's psychological behavior rather than her medical condition.

**Keywords:** Spinal anesthesia; Side effects; General anesthesia; Hemoglobin; Rbc; Platelets; Wbc

### Introduction

Over the past few decades, there has been a tremendous increase in the number of cesarean deliveries performed by section in most industrialized countries. Wide differences occur between countries, regions or even hospitals within the same region with similar socioeconomic profiles and patient characteristics [1]. This suggests that cesarean section (CS) is probably often performed for non-medical reasons leading to an overall overuse of this surgical obstetric intervention. Indeed, it has been acknowledged that elective primary and repeat CS have contributed heavily to the rise in CS [2]. In the US, for instance, the overall CS rates increased by 14% from 1998 to 2001 as a result of a 13% increase in medically indicated primary CS and a 53% increase in the rate of elective primary CS [3]. Because of this global increase in CS rates, more attention is being paid to their outcomes. Spinal, epidural or general anesthetics (GA) are the

methods of choice for CS delivery. Both methods have advantages and disadvantages. Although regional anesthesia is the primary choice in most countries, it is still controversial in some aspects. There is also a great difference between countries, regions or even hospitals regarding the preference for the method of anesthesia. In a study held at a university hospital in Turkey, only 44.5% of patients were preferentially submitted to regional anesthesia [4], as opposed to an 80% rate in the US [5].

The purpose of the anesthetic is to reduce the pain that developed during caesarean section operation. This can be achieved using a general anesthetic, a spinal anesthetic or an epidural anesthetic. There are times when these techniques may be used together [6].

General anesthesia is given using a combination of drugs that are injected into the mother and gases that mother breathe. It is used to make the mother unconscious in a carefully controlled way. General anesthesia has been shown to be very safe although it's less commonly performed than epidural or spinal anesthetics for caesarean section [7].

Spinal anesthetics are usually used as a single injection of local anesthetic for an operation. The single injection lasts for 2-3 hours. Spinal anesthetics are more commonly chosen for caesarean section, because they block the nerves more completely and more rapidly than an epidural [8]. The aim of this study is to compare the side effects of general vs spinal anesthesia during caesarian operation.

### Patients and Methods

This study was conducted in Tripoli - Libyan, between the period from December 2014 and June 2015. The study covers 50 participants divided into two groups. Group (A) were 25 females with caesarean section who subjected to general anesthesia and Group B were 25 females with caesarean section who subjected to spinal anesthesia. All participants were selected randomly despite their age, clinical condition or nationality.

Blood samples were collected by vein puncture prior and after the operation, hemoglobin concentration (Hb), red blood cells (RBCs), white blood cells (WBCs) and platelets (Plts) count were measured using Sysmex Kx21 and data were recorded. Blood pressure and body temperature were measured using sphygmomanometer and thermometer, respectively after the operation. Other data include age, type of anesthesia used, the decision to choose types of anesthesia made by whom?, number of previous caesarean section(s), presence of side effects after operation which includes: pain, headache and vomiting were collected using direct constructed questionnaire and from patient's clinical record.

### Ethical consideration

Ethical approval was submitted from participants who approved to sign consent of approval to participate in this study. The proposal of this research was submitted and approved by the ethical committee of the faculty of Medical Technology-AlMergib Univeristy.

### Results

A total of 50 participants who come for caesarean section were evaluated in this study, 25 with general anesthesia and 25 with spinal anesthesia. The mean age of participants was 30.5 years old with a range between 20-38 years. The mean age of participants with spinal anesthesia was 30.32 while for participants with general anesthesia was 30.72. The majority of caesarean sections with general anesthesia (20/25) were decided by patients themselves, most of them on their first delivery operation, while the majority of caesarean sections with spinal anesthesia (23/25) were decided by Doctors (Figure 1).

Mild side effects were noted on participants with spinal anesthesia which include vomiting, headache, localized pain and hypotension (Figure 2). All participants enrolled in this study had No infection after operation while 2 participants with spinal anesthesia had complications which required ICU admission compared to just one participant having general anesthesia. The complication in all cases due to hypotension (Figure 2).

Slight increases were noted in the mean of WBCs count after operation with marked increases among participants who had general anesthesia. The mean of red blood cells (RBCs) count, Hemoglobin concentration and platelets count were decreased after caesarean section with marked decrease in the mean to participants with general anesthesia (Table 1).

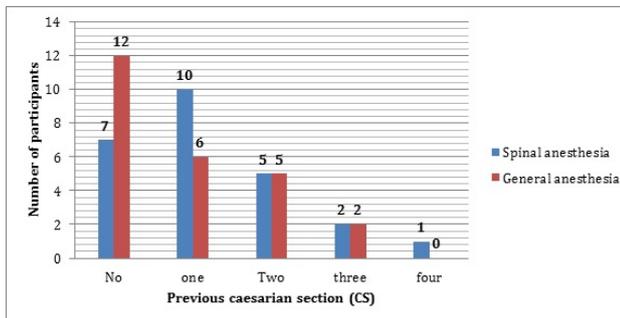
No remarkable difference was noted between the mean of systolic and diastolic blood pressure for both participants with spinal anesthesia and general anesthesia (Table 1).

Significant correlation was noted between the mean of TWBCs after operation and platelets count before operation (P value=0.011 and 0.035, respectively).

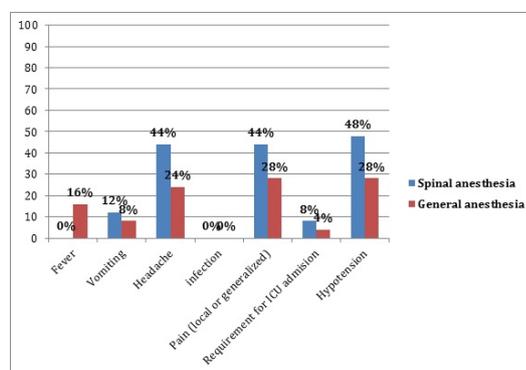
Variable	Before operation (mean ± SD)		P value	After operation (mean ± SD)		P value
	General anesthesia	Spinal anesthesia		General anesthesia	Spinal anesthesia	
TWBCs (× 10 <sup>9</sup> /L)	9.78 ± 2.514	9.86 ± 2.478	0.714	11.676 ± 2.91	10.29 ± 2.464	0.011*
RBCs (× 10 <sup>12</sup> /L)	4.07 ± 0.317	4.11 ± 0.345	0.499	3.71 ± 0.421	3.86 ± 0.306	0.363
Hemoglobin (g/L)	12.33 ± 3.477	11.35 ± 1.792	0.868	10.63 ± 1.63	10.72 ± 1.501	0.674
Platelets count (× 10 <sup>9</sup> /L)	206.08 ± 80.235	185.4 ± 40.234	0.035*	196.28 ± 56.523	174.8 ± 46.377	0.308
Systolic blood pressure (mmHg)	ND	ND	ND	111.88 ± 14.712	110.92 ± 20.093	0.67
Diastolic blood pressure (mmHg)	ND	ND	ND	68.28 ± 10.706	65.6 ± 13.048	0.862

\*Correlation is significant at the 0.05 level (2-tailed); \*\*ND: Not Done

**Table 1:** Difference in the mean ±SD between participants subjected to spinal and general anesthesia before and after the caesarean section.



**Figure 1:** Number of participants who had previous caesarian section (Chi square = 23.4, P value = 0.285).



**Figure 2:** Side effects associated with the two types of anesthesia (general and spinal anesthesia).

## Discussion

The majority of general anesthesia was decided by the patient's themselves. It is normal to feel pressure and pulling during a caesarean section operation. There is a lot of individual variation in people's size and shape and requirements for local anesthetic. It is not always possible for the anesthetist to put in a spinal. This can also result in the need to have a general anesthetic [9]. The majority of females with caesarean section who had their first delivery operation was subjected to general anesthesia while spinal anesthesia was increased after first CS and starts to decrease regularly, this might be due to that on first caesarean the patient's believe spinal anesthesia might affects their movement or may leads to paralysis.

All participants with spinal anesthesia have no fever while few of general anesthesia participants have fever, this might be due to unclean caesarean rather than due to the mode of administration of anesthesia. Infections are extremely rare, so rare that it is not possible to give an accurate incidence. All of the spinal needles, catheters, local anesthetics, intravenous drips, syringe, tubing and fluids are sterile and for single use only. The anesthetist uses a sterile technique to insert the spinal. However, it is not possible to totally eliminate the risk of infection at the injection site or around the spinal cord (causing meningitis or an abscess) [10].

A prolonged drop in maternal blood pressure has the potential to reduce blood flow to the baby. During the spinal anesthetic the blood pressure is monitored carefully by the anesthetist and treated readily to prevent potential problems for the baby. In this study decrease in blood pressure after operation was observed in some cases in both groups A and B, although there was no remarkable difference between the mean of systolic and diastolic blood pressure for both groups.

Low back pain is common after spinal injection, but is expected to resolve within 2 weeks [11]. In this study, pain was observed in both groups.

A specific type of headache, called a post spinal headache, can occur after spinal injection. This headache can be mild or severe and usually resolves spontaneously over 1-3 weeks [12]. In this study, headache was observed in both groups A (general anesthesia) and B (spinal anesthesia), but increased in group B. This result proves that patients receiving general anesthesia are much easier to suffer headache than the patients receiving spinal anesthesia. It is also important to understand that there are many other causes of headache that are more common. It is also possible to experience temporary deafness following spinal anesthetic [13]. In some patients in our study, they had it.

White blood count (WBCs) was markedly increased among participants with general anesthesia. This might be due to the general side effects of general anesthesia due to its direct introduction to the blood. Slight increases in WBCs count was observed in two groups, several studies on the effects of different anesthetic agents on WBCs count stated that some anesthetic agents increase the WBCs count [14-16].

Red blood cells (RBCs) count was decreased after caesarean section; this result is similar to the result of Ismail et al [16]. Marked decrease in the mean of RBCs count was noted in participants with general anesthesia, this also might be due to the effects of direct introduction of anesthetic agents to the blood.

## Conclusion

Although it seems to be safer, spinal anesthesia has mild side effects such as vomiting, head ache and local pain. In contrast general anesthesia may affect hematological parameters by increasing the WBCs count and decreasing hemoglobin concentration, RBCs count and platelets count. So it is highly recommended to leave the decision of type of anesthesia to the doctor upon patients' clinical condition.

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