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Evaluation of Side Effects of General and Spinal Anesthesia during Caesarean Section

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Abstract **Original Research Article**

Background: In both developed as well as developing countries, now a day, **t**he proportion of women electing for cesarean delivery has increased. In cesarean delivery, application of anesthesia is a must. Several studies compared anesthesia modalities in cesarean section regarding clinical outcomes, complications and side-effects. But in Bangladesh, we have very limited research-based information regarding those issues. ***Aim of the Study:*** The aim of this study was to evaluate of the side effects of general and spinal anesthesia during caesarean section. ***Methods:*** This was a prospective observational study which was conducted in Department of Aneaesthesia, ICU & Pain Medicine, Shaheed Suharawardy Medical College and Hospital, Dhaka, Bangladesh during the period from January 2021 to December 2021. In this study, in total 60 randomly selected patients of caesarean section was the study population. The total study subjects were divided into two groups containing 30 participants in each. In group 1, general anesthesia and in group 2 spinal anesthesia were used during caesarean section. All the demographic as well as clinical data were recorded. As per necessity data were processed, analyzed and disseminated by using MS Excel and SPSS version 23.0 program. ***Results:*** In this study, in analyzing the side effects of the respondents causing general anesthesia we found vomiting, headache and pain as the most frequent side effects which was observed in 27%, 40% and 50% cases respectively. On the other hand, in analyzing the side effects of the respondents causing spinal anesthesia we found headache, pain and hypertension as the most frequent side effects which was observed in 27%, 47% and 37% cases respectively. Besides those, fever and infection were found in some cases in both the groups as the side effects of anesthesia. ***Conclusion:*** In both general as well as spinal anesthesia there are some unavoidable side effects. Although, pain and headache are two common side effect of both the procedures, in using general anesthesia frequency of vomiting and in using spinal anesthesia the frequency of hypertension demand more attention of anesthesiologists.

Keywords: Side effects, Caesarean section, General anesthesia, Spinal anesthesia.

INTRODUCTION

In both developed as well as developing countries, now a day, the proportion of women electing for cesarean delivery has increased. In cesarean delivery, application of anesthesia is a must. In cesarean delivery, wide differences occur between countries, areas or even hospitals and patient characteristics regarding outcomes side effects and complication of anesthesia [1]. Cesarean section is often performed for nonmedical causes leading to an overall over use of this surgical approach. In several studies, it has been reported that, elective primary and replication caesarean section have contributed deeply to the rise in delivery by caesarean section [2]. In the United States, the overall caesarean section rates increased by 14% from the year of 1998 to 2001 as a result of a 13% increase in medically indicated primary caesarean section [3]. Because of this global increase in caesarean deliver rates, more attention is being paid to their outcomes. Spinal, epidural or general anesthesia is considered as the methods of choice for caesarean section delivery.

All anesthesia methods have some advantages and disadvantages. Although regional anesthesia is treated as the primary choice, it is still controversial in some aspects. In a study held in Turkey, only 44.5% of patients were preferentially submitted to regional anesthesia [4], as opposed to an 80% rate in the United States of America [5]. The purpose of using anesthetic is to reduce pain which developed during caesarean section operation. This can be achieved by a general anesthetic, an epidural anesthetic or a spinal anesthetic. There are some situations when these procedures may be used together [6]. General anesthesia is given using a mixture of drugs which are injected into the pregnant mother and gases that mother inhale. It is applied to make the mother insensible in a carefully controlled way. General anesthesia has been considered to be very safe although it's a reduced amount of commonly performed than epidural/spinal anesthetics for the delivery of caesarean section [7]. Spinal anesthetic technics are usually used as an only injection of local anesthetic for an operation where the single injection lasts for 2 to 3 hours' spinal anesthetics are more frequently chosen for the reason that, they block the nerves more completely as well as more promptly than an epidural [8]. The main objective of this study was to evaluate the side effects of general and spinal anesthesia during caesarian section.

METHODOLOGY

This was a prospective observational study which was conducted in Department of Aneaesthesia, ICU & Pain Medicine, Shaheed Suharawardy Medical College and Hospital, Dhaka, Bangladesh during the period from January 2021 to December 2021. In this study, in total 60 randomly selected patients of caesarean section was the study population. The total study subjects were divided into two groups containing 30 participants in each. In group 1, general anesthesia and in group 2 spinal anesthesia were used during caesarean section. All participants were selected randomly despite their clinical condition or age. From all the participant's proper written consents were taken before data collection. In accordance with the principles of human research specified in the Helsinki Declaration the whole intervention was conducted [9] and executed in compliance with currently applicable regulations and the provisions of the General Data Protection Regulation (GDPR) [10]. According to the inclusion criteria of this study, patients with indication for anesthesia, height less than 180 cm, weight less than 100 kg, absence of spinal deformities were included as the study subjects. On the other hand, as per the exclusion criteria of this study, cases with contraindications to spinal anesthesia, presence of hemo-dynamically relevant cardiovascular co-morbidities, refusal of pregnant women to sign informed consent, refusal of pregnant women to spinal anesthesia, spinal deformities, patients with known hypersensitivity to the anesthetics, weight >100 kg, height >180 cm, patients with preeclampsia or eclampsia and cases with the presence of fetal or placental abnormalities were excluded. All the demographic and clinical data of the participants were recorded. Collected data were processed, analyzed and disseminated by using MS Excel and SPSS version 23.0 program as per necessity.

RESULTS

In this study, the age range of the participants was 20-40 years. The mean ±SD age of them was 27.45±5.84 years. Among total 60 pregnant mothers, majority (62%) were from ≤30 years and the rest 38% were from >30 years of age. As the laboratory findings in general anesthesia group, the mean ±SD TWBCs (1×109/L), RBCs (1×1012/L), hemoglobin (g/L) and platelets count (1×109/L) were found as 8.75±2.34, 3.71± 0.29, 10.56±2.52 and 205.42±47.28 respectively. On the other hand, the mean ±SD values of those variables were found as 9.06±2.14, 3.66±0.31, 10.48±2.37 and 198.33±39.41 respectively in spinal anesthesia groups. In this intervention, we observed that, in group 1, in majority of cases (83%), general anesthesia was used by the decision of respondents themselves. On the other hand, in group 2, in majority of cases (87%), spinal anesthesia was used by the decision of respective doctors. In this study, in analyzing the side effects of the respondents causing general anesthesia we found vomiting, headache and pain as the most frequent side effects which was observed in 27%, 40% and 50% cases respectively. On the other hand, in analyzing the side effects of the respondents causing spinal anesthesia we found headache, pain and hypertension as the most frequent side effects which was observed in 27%, 47% and 37% cases respectively. Besides those, fever and infection were found in some cases in both the groups as the side effects of anesthesia.

Table 1: Laboratory finding (mean ±SD) among patients of both groups (N=60)

Characteristics	General anesthesia	Spinal anesthesia
TWBCs (1× 10^9/L)	8.75 ± 2.34	9.06 ± 2.14
RBCs (1× 10^{12}/L)	3.71 ± 0.29	3.66 ± 0.31
Hemoglobin (g/L)	10.56 ± 2.52	10.48 ± 2.37
Platelets count (1× 10^9/L)	205.42 ± 47.28	198.33 ± 39.41

Table 2: Decision making for using general or spinal anesthesia (N=60)

Anesthesia	Decision by			
	Doctor (n)	%	Self (n)	%
General anesthesia	5	17%	25	83%
Spinal anesthesia	26	87%	4	13%

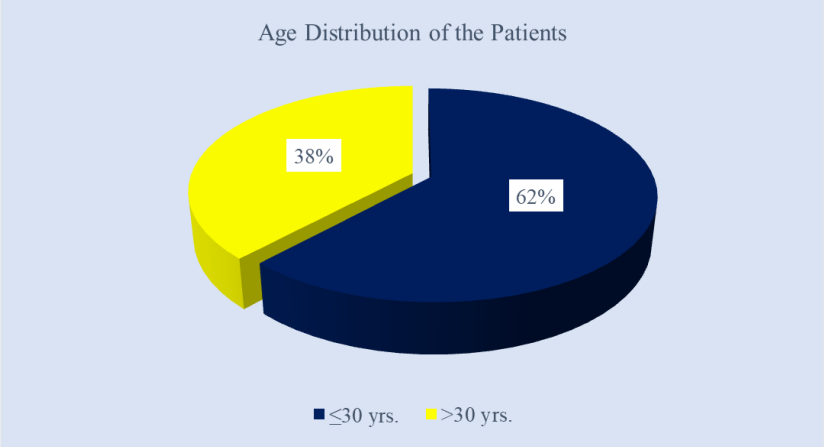

Figure I: Bar chart showed Age distribution of the patients (N=60)

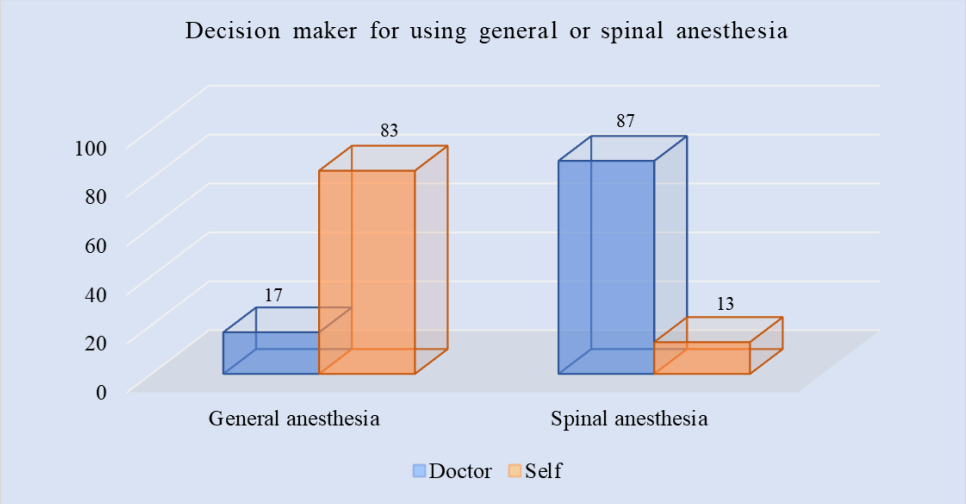

Figure II: Bar chart showed making decision maker for using general or spinal anesthesia (N=60)

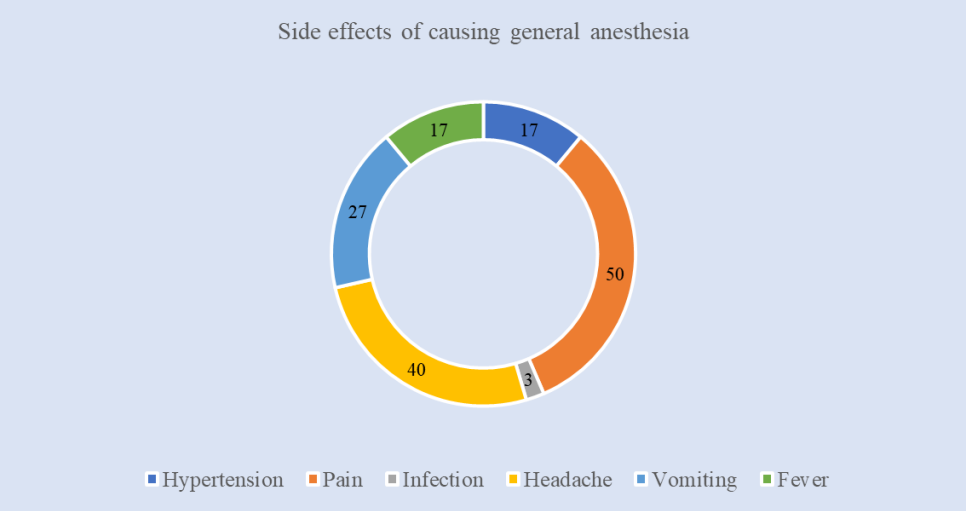

Figure III: Ring chart side effects of the respondents causing general anesthesia (n=30)

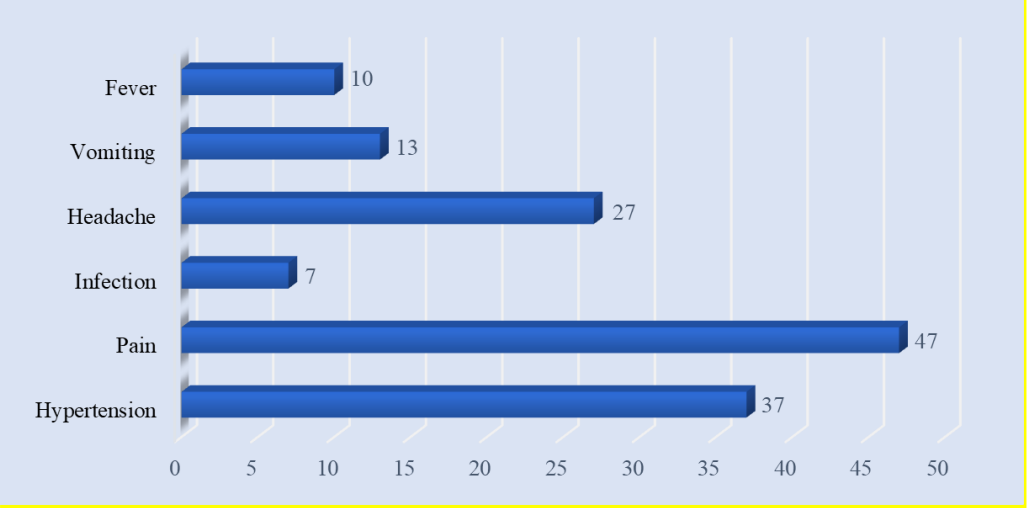

Figure IV: Bar chart showed side effects of the respondents causing spinal anesthesia (n=30)

DISCUSSION

The aim of this study was to evaluate of the side effects of general and spinal anesthesia during caesarean section. In this study, the age range of the participants was 20-40 years. The mean ±SD age of them was 27.45±5.84 years. Among total 60 pregnant mothers, majority (62%) were from ≤30 years and the rest 38% were from >30 years of age. It is normal to feel pressure and pulling through a caesarean section operation. There is a lot of individual variation in patient's size and shape and requirements for local anesthetics. It is not always possible or easy for the anesthetist to put in a spinal. This can also result in the need to have a general anesthetic [11]. In this intervention, we observed that, in group 1, in majority of cases (83%), general anesthesia was used by the decision of respondents themselves. On the other hand, in group 2, in majority of cases (87%), spinal anesthesia was used by the decision of respective doctors. The majority of female with caesarean section who had their first delivery was subjected to general anesthesia while spinal anesthesia was increased after first caesarean section and starts to decrease regularly, because patients believe was: spinal anesthesia might affect their movement or may leads to paralysis. In this study, in analyzing the side effects of the respondents causing general anesthesia we found vomiting, headache and pain as the most frequent side effects which was observed in 27%, 40% and 50% cases respectively. On the other hand, in analyzing the side effects of the respondents causing spinal anesthesia we found headache, pain and hypertension as the most frequent side effects which was observed in 27%, 47% and 37% cases respectively. Besides those, fever and infection were found in some cases in both the groups as the side effects of anesthesia. In a study it was reported that, it is not possible to totally eliminate the risk of infection at the injection site or around the spinal cord [12]. During the procedure, a prolonged drop in maternal blood pressure has the potential to reduce blood flow to the baby. During the spinal anesthetic procedure, the blood pressure is monitored carefully by the anesthetists and treated readily to prevent potential problems for the baby. In this study in some cases, decrease in blood pressure after operation was observed in both groups, although there was no remarkable difference between the mean of SBP and DBP for both groups. In a study they reported that, low back pain (LBP) is common after spinal injection, but is expected to resolve within 2 weeks [13]. In this study, pain was observed in both groups more frequently. A specific type of headache which is also called as post spinal headache can occur after spinal injection. This headache can be mild or even severe and usually resolves spontaneously over 1 to 3 weeks [14]. In another study it was reported that, it is also possible to experience temporary deafness following spinal anesthetics [15]. In our study, white blood count was markedly increased among participants with general anesthesia. Due to its direct introduction to the blood, this might be the general side effects of general anesthesia. Slight increases in white blood count were observed in two groups; several studies on the effects of different anesthetic agents on white blood count (WBCs) stated that, some anesthetic agents increase the WBCs count [16, 17]. On the other hand, red blood cells (RBCs) count was decreased after caesarean section and that result was similar to the result of Ismail *et al.*, [18]. All the findings of this study may be helpful in further similar studies.

Limitation of the Study

This was a single centered study with small sized samples. Moreover, the study was conducted at a very short period of time. That's why; the findings of this study may not reflect the exact scenario of the whole country.

CONCLUSION & RECOMMENDATION

In both general as well as spinal anesthesia there are some unavoidable side effects. Although, pain and headache are two common side effect of both the procedure in using general anesthesia frequency of

vomiting and in using spinal anesthesia the frequency of hypertension demand more concentration of anesthesiologists. To get more specific findings we would like to recommend for conducting more studies like this in several places with some big size samples.

REFERENCES

1. Loo, C. C., Dahlgren, G., & Irestedt, L. (2000). Neurological complications in obstetric regional anaesthesia. *Int J Obstet Anesth*, 9, 99-124.
2. Kararmaz, A., Kaya, S., Turhanoglu, S., & Ozyilmaz, M. A. (2003). which administration route of fentanyl better enhances the spread of spinal anaesthesia: intravenous, intrathecal or both? *Acta Anaesthesiol Scand*, 47, 1096-1100.
3. Marc, C., & Norris. (2000). Handbook of Obstetric Anesthesia. Lippincott Willims and Wilkins, Philadelphia.
4. Gadsden, J., Hart, S., & Santos, A. C. (2005). Post-cesarean delivery analgesia. *Anesth Analg*, 101, S62-69.
5. Cardoso, M. M., Carvalho, J. C., Amaro, A. R., Prado, A. A., & Cappelli, E. L. (1998). Small doses of intrathecal morphine combined with systemic diclofenac for postoperative pain control after cesarean delivery. *Anesth Analg*, 86, 538-541.
6. Ong, B. Y., Cohen, M. M., & Palahniuk, R. J. (1989). Anesthesia for cesarean section--effects on neonates. *Anesth Analg*, 68, 270-275.
7. Graham, D., & Russell, I. F. (1997). A double-blind assessment of the analgesicsparing effect of intrathecal diamorphine (0.3 mg) with spinal anaesthesia for elective caesarean section. *Int J Obstet Anesth*, 6, 224-230.
8. Russell, R., & Reynolds, F. (1997). Back pain, pregnancy, and childbirth. *BMJ*, 314, 1062-1063.
9. World Medical Association. (2001) . World Medical Association Declaration of Helsinki. Ethical principles for medical research involving human subjects. *Bulletin of the World Health Organization*, 79(4) , 373-374. World Health Organization. https://apps.who.int/iris/handle/10665/268312.
10. Voigt, P., & Axel von dem, B. (2017). "Enforcement and fines under the GDPR." The EU General Data Protection Regulation (GDPR). Springer, Cham, 201-217.
11. Ranasinghe, J. S., Steadman, J., Toyama, T., & Lai, M. (2003). Combined spinal epidural anaesthesia is better than spinal or epidural alone for Caesarean delivery. *Br J Anaesth*, 91, 299-300.
12. Mancuso, A., De Vivo, A., Giacobbe, A., Priola, V., Savasta, L. M., Guzzo, M., ... & Mancuso, A. (2010). General versus spinal anaesthesia for elective caesarean sections: effects on neonatal short-term outcome. A prospective randomised study. *The Journal of Maternal-Fetal & Neonatal Medicine*, *23*(10), 1114-1118.
13. Yegin, A., Ertug, Z., Yilmaz, M., & Erman, M. (2003). The effects of epidural anesthesia and general anesthesia on newborns at cesarean section. *Turk J Med Sci*, 33, 311-314.
14. Solangi, S. A., Siddiqui, S. M., Khaskheli, M. S., & Siddiqui, M. A. (2012). Comparison of the effects of general vs spinal anesthesia on neonatal outcome. *Anaesth Pain Intens Care*, 16, 18-23.
15. Afolabi, B. B., & Lesi, F. E. (2012). Regional versus general anaesthesia for caesarean section. *Cochrane Database Syst Rev*, 10, CD004350.
16. Lemke, K. A., Runyon, C. L., & Horney, B. S. (2002). 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*, 220, 1818-1822.
17. Khalaf, F. H., AL-Zuhairi, A. H., & Al-Mutheffer, E. A. (2014). Clinical and hematological effect of Acepromazine, Midazolam, Ketamine as general anesthesia protocol in rabbits. *International Journal of Science and Nature*, 5, 328-331.
18. Ismail, Z. B., Jawasreh, K., & Ahmad Al-Majali, A. (2010). Effects of xylazineketamine- diazepam anesthesia on blood cell counts and plasma biochemical values in sheep and goats. *Comp Clin Pathol*, 19, 571-574.