

# A Comparative Study on the Effects of Spinal Versus General Anaesthesia on Apgar Score of the Neonates among Patients Enduring Elective Caesarean Section

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## ABSTRACT

**Objective:** The purpose of this analysis was to do the comparison of the effect of general anesthesia and spinal anesthesia on neonatal Apgar score in patients enduring elective cesarean section.

**Study design:** A Randomized control trial.

**Place and duration:** In the department of Anesthesia, pain and intensive care Divisional Headquarters teaching Hospital Mirpur Hospital for six-months duration from July 2021 to December 2021.

**Methods:** In this study, 120 patients in the cesarean section operating room list were alienated into 2 equal groups. Group I (n = 60) were given spinal anesthesia and in group II (n = 60), general anesthesia was given. There was no significant difference in height, weight and age of patients. Patient information is recorded on the designed performa. Comparisons were made between groups I and II. Apgar scores were assessed 1 and 5 minutes after birth and recorded as proforma.

**Results:** The patients mean age of the group-I was 30.04 ± 4.9 years and 29.81 ± 5.84 years in the group-II. The mean change between the groups was not statistically substantial (p = 0.66). The patients mean weight in the first group was 70.95 ± 10.31 kg and in the second group it was 73.50 ± 11.28 kg. Infants born to women who received spinal anesthesia had a higher Apgar score at 1 minute and 5 minutes compared to females who were given general anesthesia (P <0.001). The highest proportion of patients in the first group exhibited better Apgar score than patients in the second group.

**Conclusion:** Neonates of females who had cesarean section under spinal anesthesia had better APGAR score than under general anesthesia.

**Keywords:** Apgar score, spinal anesthesia, general anesthesia, neonatal

## INTRODUCTION

Regional and general anesthesia as well as epidural or spinal anesthesia techniques can be used for cesarean section<sup>1-2</sup>. The type of anesthesia used affects the outcome of the mother and baby. International guidelines for midwives commend epidural or spinal anesthesia instead of GA for most cesarean sections<sup>3-4</sup>. The main purpose for commending regional blocks is the risk of aspiration and ineffective endotracheal intubation in gravid females under GA<sup>5-6</sup>. There is suggestion GA is related with an augmented necessity for resuscitation in infants<sup>7</sup>. Spinal anesthesia is easier, safer and more cost-effective than other methods such as epidural or general anesthesia<sup>8</sup>. It is easy to do and requires nominal supervision and provides better results for the fetus after cesarean section. Under general anesthesia, most drugs can directly affect the fetus through the placenta or indirectly and affect the physiological and biochemical changes of the mother<sup>9</sup>. Many medications are needed for general anesthesia that systematically affect the child and lead to low Apgar scores<sup>10</sup>. And general anesthesia carries the jeopardy of problematic intubation and can cause maternal lung aspiration, nausea, vomiting and delayed recovery<sup>11</sup>. Maternal mortality recorded in various studies is 10%. 0.75% bupivacaine in 1.5 ml is given to persuade spinal anesthesia, which is improbable to have any effect on the infant systemically. Extra benefits of spinal anesthesia comprise reducing infants' contact to antidepressants, reducing the risk of maternal pulmonary aspiration, and increasing maternal alertness during labor<sup>12</sup>. As with any regional procedure, its disadvantages include excessive block, prolonged anesthesia, the risk of hypotension, and postdural headache. Previous studies have shown that children under general anesthesia have lower Apgar scores than children under spinal anesthesia<sup>12</sup>. This analysis was accomplished to assess the safest anesthesia regimen for elective cesarean section for neonatal outcomes.

## PATIENTS AND METHODS

This study was performed in the department of Anesthesia, intensive care and pain Management at Divisional

Headquarters Teaching Hospital Mirpur for six-months duration from July 2021 to December 2021 with the consent of the competent authority. 120 ASA-I patients will have an elective cesarean section. Patients' informed consent was obtained during the visit before anesthesia.

Inclusion criteria 1. Elective C-section at 36-40 weeks 2. Single pregnancy 3. ASA I 4. Adequate liquor.

Exclusion criteria: 1. The patient denied for the study 2. History of allergy to local anesthesia 3. Emergency conditions 4. Abnormalities in coagulation 5. Infections at the lumbar puncture site 6. Time from skin incision to uterus more than 10 minutes. 7. Time from uterine incision to delivery more than 3 minutes. 8. Premature infants

In this study, 120 patients in the cesarean section operating room list were alienated into 2 equal groups. Group I (n = 60) were given spinal anesthesia and in group II (n = 60), general anesthesia was given. Patients were reassured upon entering the operating room to decrease their anxiety. In group I, baseline heart rate and blood pressure measurements were recorded after intravenous access and monitoring. Ringer's lactate was used for the initial load and the dose was taken according to the patient's body weight (15 ml / kg). After explanation of the technique and performing all precautions of aseptic techniques, the patient placed in lateral or sitting position. The Interspinous space was defined as L2 / L3 or L3 / L4 and 2% lidocaine was injected into the overlying skin. A 25-gram spinal needle was then inserted amid the interstitial spaces L3 and L4, and 0.75% hyperbaric bupivacaine in 1.5 ml dose was inoculated after observing clear cerebrospinal fluid and confirming its intrathecal position. After removing the needle, a sterile bandage was applied and the patient was placed on his supine position. The heart rate and blood pressure were documented at consistent duration. In the second group of patients, general anesthesia was performed using standard research methods after intravenous access and monitoring. Apgar scores were assessed at 1 and 5 minutes after birth and recorded on proforma. Statistical analysis was performed with SPSS version 22.0. The standard deviation and mean of quantitative variables such as weight, Apgar score and age were recorded. The

comparison of the mean differences amid groups in terms of body weight, Apgar score and age was done with independent t-test.  $P < 0.05$  was taken as significant.

## RESULTS

The patients mean age of the group-I was  $30.04 \pm 4.9$  years and  $29.81 \pm 5.84$  years in the group-II. The mean change between the groups was not statistically substantial ( $p = 0.66$ ). The patients mean weight in the first group was  $70.95 \pm 10.31$  kg and in the second group it was  $73.50 \pm 11.28$  kg. Infants born to women who received spinal anesthesia had a higher Apgar score at 1 minute and 5 minutes compared to females who were given general anesthesia ( $P < 0.001$ ). The highest proportion of patients in the first group exhibited better Apgar score than patients in the second group.

Table 1: Characteristics of the patients

Characteristics	Group-I (spinal anesthesia)	Group-II (General anesthesia)
Males	24(20%)	29(24.2%)
Females	35(29.2%)	32(26.7%)
Mean Age	$30.04 \pm 4.9$ years	$29.81 \pm 5.84$ years
Weight Mean	$70.95 \pm 10.31$ kg	$73.50 \pm 11.28$

The percentage of patients with different Apgar scores at 1 minute and 5 minutes is also shown in Table 2. The percentage of patients in 1<sup>st</sup> group compared to 2<sup>nd</sup> group showed a significant enhancement in higher Apgar score.

Table 2: Mean Apgar score at 1 and 5 minutes

Apgar Score	Group-I (spinal anesthesia)	Group-II (General anesthesia)	P-Value
At 1 mint	$7.97 \pm 0.91$	$7.20 \pm 0.85$	0.69
At 5 Mint	$9.22 \pm 0.41$	$9.83 \pm 0.33$	0.001
Ph	$7.39 \pm 0.12$	$7.18 \pm 0.15$	0.016

Table 3: Comparison of satisfactory condition with respect to Apgar score at five minutes

Apgar Score	Group-I (spinal anesthesia)	Group-II (General anesthesia)
Apgar score $\geq 7$	58(96.7%)	52(86.7%)
Apgar score $< 7$	2((3.3%)	8(13.3%)

## DISCUSSION

Spinal anesthesia may be preferred to general anesthesia in cesarean section because of the earlier commencement of breastfeeding and improved Apgar score<sup>13-14</sup>. Maternal satisfaction with elective cesarean section in epidural was higher than spinal anesthesia. Subsequently general anesthesia is accountable for most low Apgar score babies born by elective cesarean section, so, more spinal anesthesia is recommended during elective cesarean section<sup>15</sup>. Many studies have shown that there is a significant difference between spinal and general anesthesia<sup>16</sup>. The most positive results were obtained with spinal anesthesia. In a prospective randomized study of the effects of anesthesia in infants, Coltat et al. Children Apgar scores whose mothers were given general anesthesia were lesser than those whose mothers were given regional anesthesia<sup>17-18</sup>. Two additional studies in Canada and Khartoum also showed that general anesthesia was related with higher frequency of low Apgar scores per minute. There was no alteration in infant mortality rates under general and regional anesthesia. Wallace et al. Comparison of GA with spinal/epidural for cesarean section in a prospective randomized anesthesia study<sup>19-20</sup>. There was no substantial change amid groups in terms of maternal neonatal complications. A Hood et al retrospective study and Sharowood Smith et al prospective study is consistent with these findings<sup>21-22</sup>. General anesthesia for emergency cesarean section can lead to inferior outcomes for the baby and mother, and regional anesthesia is usually suggested. In this analysis, although Apgar score was not affected by infant gender and maternal age, it was higher in infants of women who

underwent spinal anesthesia<sup>23-24</sup>. Because in addition to the type of anesthesia, many factors affect the Apgar score, such as induction of labor, incision during labor, baby weight, and gestational age. Therefore, more work is needed to deal with the above variables.

## CONCLUSION

Neonate born to women who underwent cesarean section had better Apgar scores on spinal anesthesia compared to general anesthesia.

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