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Comparison of The Effects of General and Spinal on Apgar Scores of Babies Born Through Caesarean Section in RSUP Haji Adam Malik Medan from 2018 to 2019

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Abstract.

Background. General anesthesia and spinal anesthesia in cesarean section both have advantages and disadvantages. The scoring system of APGAR is a standardized tool that can inform the condition of newborn infants, which might be influenced by gestational age, medication, resuscitation, cardiorespiratory and neurological conditions of the mother. This study aimed to compare the effect of general and spinal anesthesia usage to the APGAR score of newborn infants at Haji Adam Malik General Hospital Medan.

Methode. This study uses an observational-analytic design with a cross-sectional approach, conducted using secondary data through the medical records of mothers who gave birth through cesarean section and obtained at the Medical Record Installation at the Haji Adam Malik Hospital Medan from 2018 to 2019.

Result. In spinal anesthesia, there are 52 samples for a score of 8-10. Whereas in general anesthesia, there are 52 samples to score 8-10. The APGAR score of 1 minute in infants born through cesarean section under spinal anesthesia had an average of 8.63, with general anesthesia of 8.00 (p=0.001). The 5-minute APGAR score in infants born through cesarean section under spinal anesthesia had an average of 9.85, and with general anesthesia of 8.67 (p=1.000).

Conclusion: The 1-minute APGAR score for infants using spinal anesthesia showed a statistically better effect than the 1-minute APGAR score for infants using general anesthesia.

Keyword: APGAR Score, General or Spinal anesthesia

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Abstrak.

Latar Belakang. *Anestesi umum dan anestesi tulang belakang dalam operasi caesar keduanya memiliki kelebihan dan kekurangan. Sistem penilaian APGAR adalah alat standar yang dapat menginformasikan kondisi bayi yang baru lahir, yang mungkin dipengaruhi oleh usia kehamilan, obat-obatan, resusitasi, kardiorespirasi dan kondisi neurologis ibu. Penelitian ini bertujuan untuk membandingkan efek penggunaan anestesi umum dan tulang belakang dengan skor APGAR bayi yang baru lahir di Rumah Sakit Umum Haji Adam Malik Medan.*

Methode. *Penelitian ini menggunakan desain observasional-analitik dengan pendekatan cross-sectional, dilakukan dengan menggunakan data sekunder melalui rekam medis ibu yang melahirkan melalui operasi caesar dan diperoleh pada Instalasi Rekam Medis di RSUP Haji Adam Malik Medan dari tahun 2018 hingga 2019.*

Hasil. *Dalam anestesi tulang belakang, ada 52 sampel untuk skor 8-10. Sedangkan pada anestesi umum, ada 52 sampel untuk skor 8-10. Skor APGAR 1 menit pada bayi yang lahir melalui operasi caesar di bawah anestesi tulang belakang memiliki rata-rata 8,63, dengan anestesi umum 8,00 (p = 0,001). Skor APGAR 5 menit pada bayi yang lahir melalui operasi caesar di bawah anestesi tulang belakang memiliki rata-rata 9,85, dan dengan anestesi umum 8,67 (p = 1.000).*

Kesimpulan. *Skor APGAR 1 menit untuk bayi yang menggunakan anestesi tulang belakang menunjukkan efek yang lebih baik secara statistik daripada skor APGAR 1 menit untuk bayi yang menggunakan anestesi umum.*

Kata Kunci*: Skor APGAR, Anestesi Umum atau Spinal*

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1 Introduction

Although it is a labor technique that involves major abdominal surgery, Caesarean section is still preferred to birth delivery (vaginal delivery).[1] The rate of births with cesarean section globally has doubled from 16 million births (12%) in 2000 to 29.7 million (21%) in 2015.[2] The choice of anesthesia technique used in cesarean section delivery is general anesthesia or regional anesthesia, which have their advantages and disadvantages.[3] General anesthesia has the advantage of faster work procedures often performed in cases where time is the main factor, decreased incidence of hypotension and cardiovascular instability, airway and ventilation are maintained and controlled.[4] Side effects of general anesthesia techniques include the risk of difficult intubation, maternal lung aspiration, delayed recovery, nausea, and vomiting and are often associated with the incidence of neonatal depression that often requires resuscitation.[5] Spinal anesthesia is usually considered more practical and safer than other techniques such as: general and epidural because it is easy to administer, only requires minimal monitoring; the dose of drug needed to induce spinal anesthesia is 1.5 milliliters, so it does not produce systemic effects in infants, less exposure to depressant drugs decreased risk of maternal pulmonary aspiration and mothers who are awake at the birth of a baby.[6]

The APGAR assessment system is a standardized assessment tool that can describe the condition of a newborn and record the fetal to neonatal transition immediately after delivery. APGAR scores are influenced by gestational age, maternal medication, resuscitation, and cardiorespiratory and

neurological conditions. The APGAR score consists of 5 components: heart rate, breathing, muscle tone, reflex cry, and skin color. Each score is 0, 1, or 2. The score is reported 1 and 5 minutes after birth.[7] The main difference between the APGAR assessment at 1 and 5 minutes is that the APGAR assessment in the first minute of birth shows indications of intrapartum health and neonatal responses to birth trauma [8]. A 5-minute APGAR score from 7 to 10 is interpreted as usual. Scores 4, 5, and 6 are intermediate, and scores 0 to 3 can be correlated with neonatal mortality, but alone is not a marker of an increased risk of neurological dysfunction. The score may result from physiological immaturity, maternal medication, the presence of congenital abnormalities, and other factors.[7]

2 Methods

This study uses an observational analytic study design using a cross-sectional study (cross-sectional study). The study was conducted using secondary data through the medical records of mothers who gave birth through cesarean section and data on medical records of infants born to mothers obtained at the Medical Record Installation at the Haji Adam Malik Hospital in Medan. The population in this study were all mothers who delivered cesarean section and all infants born in Haji Adam Malik Hospital Medan in the 2018-2019 period. The research sample taken is the subject of the selected population and has fulfilled the inclusion and exclusion criteria. The sampling technique in this study is simple random sampling. Inclusion criteria are babies born through cesarean section, available APGAR scores in the medical record, available anesthesia measures used in the medical record, assessment of age at term (gestational age 37-42 days according to First Day of Last Menstruation {HPMT}), and American physical status Society of Anesthesiologist (ASA) of IV. While the exclusion criteria, namely pregnancy growth retardation in utero, intrauterine fetal death / fetal death in the womb, and change of anesthesia technique.

Large samples were determined using the research sample formula,[9] and the minimum large sample used in this study was 47 subjects and an increase of 10% from the number of dropouts. The total number of subjects required was 52 people. Data obtained from this study will be collected and analyzed using a multivariate linear regression test using SPSS software (Statistical Package for Social Sciences). The relationship between general anesthesia and spinal anesthesia with APGAR score of babies born through cesarean section at RSUP HAM Medan was determined using the Mann-Whitney statistical hypothesis test. Out of 184 samples of mothers giving birth through cesarean section at the Haji Adam Malik General Hospital in 2018-2019 using the simple random sampling method, 104 samples were selected that met the inclusion criteria. Tests were conducted to see comparisons between groups depending on the data distribution, so the previous normality test is done with the Kolmogorov-Smirnov normality test because the sample from each APGAR score group is more than 50. The normality test performed shows an abnormal distribution because the P-value in each - each group is less than 0.05. Then further analysis was performed with the Mann-Whitney test to see differences in the median and

mean APGAR scores in the spinal and general anesthesia groups. The medical record data that had been collected is then analyzed to obtain the results of the study.

3 Results

Table 1 shows that the frequency distribution of each type of anesthesia, both spinal and general anesthesia, is 52 (50.0%). The number of samples refers to a simple random sampling technique through the sample formula for correlation research [9].

Table 1 Frequency distribution of types of anesthesia

Types of	Quantity (n)	Percentage (%)
Spinal	52	50.0
General	52	50.0
Total	104	100

Table 2 shows the distribution of 1-minute APGAR score assessment in spinal anesthesia and general anesthesia. In spinal anesthesia, there is one sample for a score of 5-7 and 51 samples for a score of 8-10. Whereas in general anesthesia, there are 14 samples for a score of 5-7 and 38 samples for a score of 8-10.

Table 2 Distribution of 1-minute APGAR score assessment

Types of	1-minute APGAR Score			Total
	0-4	5-7	8-10	
Spinal	0	1	51	52
General	0	14	38	52
Total	0	15	89	104

Table 3 shows the distribution of the 5-minute APGAR score assessment in spinal anesthesia and general anesthesia. In spinal anesthesia, there are 52 samples for a score of 8-10. Whereas in general anesthesia, there are 52 samples to score 8-10.

Table 3 Distribution of 5-minute APGAR score assessment

Types of	5-minute APGAR Score			Total
	0-4	5-7	8-10	
Spinal	0	0	52	52
General	0	0	52	52
Total	0	0	104	104

Table 4 shows the distribution of the 10-minute APGAR score assessment in spinal anesthesia and general anesthesia. In spinal anesthesia, there are 52 samples for a score of 8-10. Whereas in general anesthesia, there are 52 samples to score 8-10.

Table 4 Distribution of 10-minute APGAR score assessment

Types of	10-minute APGAR Score			Total
	0-4	5-7	8-10	
Spinal	0	0	52	52
General	0	0	52	52
Total	0	0	104	104

Table 5 shows that the APGAR score of 1 minute in infants born through cesarean section under spinal anesthesia had an average of 8.63, with general anesthesia of 8.00. For data analysis, using the Mann-Whitney test obtained a p-value of 0.001. The p-value is less than 0.05, which means that there are significant differences between the two groups or significant.

Table 5 Comparison of 1-minute APGAR Score in the Spinal and General Group

Types of	Mean	Median	Range	N	*P-value*
Spinal	8.63	9.00	3	52	
General	8.00	8.00	2	52	0.001
Total	8.32	8.00	3	104	

Table 6 shows that the 5-minute APGAR score in infants born through cesarean section under spinal anesthesia had an average of 9.85, and with general anesthesia of 8.67. For data analysis using the Mann-Whitney test and a p-value of 1.000 was obtained. The p-value is more significant than 0.05, which means that it has no significant differences.

Table 6 Comparison of the 5-minute APGAR Score in the Spinal and General Group

Types of	Mean	Median	Range	N	*P-value*
Spinal	9.85	10.00	1	52	
General	8.67	9.00	2	52	1.000
Total	9.26	9.00	2	104	

Table 7 shows that the APGAR score of 10 minutes in infants born through cesarean section under spinal anesthesia had an average of 9.98 and general anesthesia of 9.37. For data analysis using the Mann-Whitney test and a p-value of 1.000 was obtained.The p-value is more significant than 0.05, which means that it has no significant differences.

Table 7 Comparison of the 10-minute APGAR Score in the Spinal and General Group

Types of	Mean	Median	Range	N	*P-value*
Spinal	9.98	10.00	1	52	
General	9.37	9.00	1	52	1.000
Total	9.67	10.00	1	104	

4 Discussion

The previous studies conducted by Flora Lasmaria at Hasan Sadikin Hospital in Bandung published in 2014, which states that there was a significant difference in the first minute APGAR

score, where the APGAR value of babies 1 minute was higher on spinal anesthesia compared with general anesthesia.[10] This case is also found in a study conducted by Mai Wedad Abdallah at Kasr El Aini Hospital in Cairo published in 2014 states that significant differences were recorded in the APGAR 1 minute score, where the reading of the spinal anesthesia score was higher than that of general anesthesia.[11] This case was also stated in a study by Ipek Saadet Edipoglu at the Istanbul Turkey Training and Research Hospital published in 2018, which stated that the APGAR score of 1 minute under general anesthesia was lower than regional anesthesia.[12]

The previous studies conducted by Flora Lasmaria at Hasan Sadikin Hospital in Bandung published in 2014. There were no significant differences in the fifth minute of both spinal and general anesthesia.[10] This case was also stated in a study by Ipek Saadet Edipoglu at the Istanbul Turkey Training and Research Hospital published in 2018, which states that the 5-minute APGAR score on spinal anesthesia did not significantly differ with general anesthesia.[12] The data in Table 7 shows similarities to previous studies, namely an international survey conducted by Hana Harazimin the Czech Republic and Slovakia published in 2015, which revealed no significant difference in the APGAR score at 10 minutes in either the general anesthesia group or spinal anesthesia.[13]

5 Conclusions

There were significant differences between the 1-minute APGAR score of babies born through a cesarean section on the use of general anesthesia and spinal anesthesia. Then, there was no significant difference between the APGAR score of 5 minutes and 10 minutes in infants born through a cesarean section to the use of general anesthesia and spinal anesthesia. Furthermore, the 1-minute APGAR score for infants using spinal anesthesia showed a statistically better effect than the 1-minute APGAR score for infants using general anesthesia.

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