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The differences of hemoglobin levels in pregnant women patients before and after caesarean section

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ABSTRACT

Caesarean section is a process to remove a fetus or baby through an incision in the abdominal wall and upper uterus because a normal birth process is not possible. The process by Caesarean section requires careful preparation because the result can be bleeding. One of the tests before and after Caesarean section is checking the hemoglobin level. The purpose of this study was to determine the differences in hemoglobin levels before and after Caesarean section. This research is a quantitative analysis. Sampling was conducted in April 2018 at RSIA Fauziah Tulungagung and hemoglobin levels were checked using the Cyanmehemoglobin method at the STIKes Hutama Abdi Husada Tulungagung Pathology Laboratory. The population of this study were all pregnant women who underwent a Caesarean section at RSIA Fauziah Tulungagung using a total sampling technique of 30 samples. The instrument used was a photometer, then the data was processed using SPSS 16 software and analyzed using the Paired T-Test technique. The results of research conducted on 30 samples of Caesarean section patients obtained an average hemoglobin level before Caesarean section 13.13 g / dl and an average hemoglobin level after Caesarean section 12.06 g / dl after the Paired T-Test was obtained. 0.002 <0.05. It can be concluded that there is a significant difference between the hemoglobin levels before and after Caesarean section. Bleeding during Caesarean section causes hemoglobin levels in pregnant women to decrease.

INTRODUCTION

Pregnancy is a physiological phenomenon and is associated with pain, fear, anxiety and even fear of death for the mother. Every pregnant woman hopes to have a smooth labour and deliver a perfect baby. During pregnancy, women must make decisions about the birth process, either through normal birth, or a Caesarean section[1]. Delivery by Caesarean section is indicated for certain medical indications, which are divided into indications for the mother and indications for the baby. Cesarean section should be an alternative to delivery when normal delivery is no longer possible[2].

The World Health Organization recommends that the delivery rate by Caesarean section should not be more than 5-15%. The caesarean section rate in developed countries ranges from 1.5-7%, while for developing countries the proportion of births with SC is around 21.1%. In Indonesia, the incidence of Caesarean section in government hospitals is around 20-25%, while in private hospitals it is around 30-80% of total deliveries. The incidence of Caesarean section in East Java Province in 2009 amounted to 3,401 operations out of 170,000 deliveries or about 20% of all deliveries[3]. The rate of

cesarean delivery at one of the Mother and Child Hospitals in Tulungagung, namely RSIA Fauziah is quite high. In one month, on average, there are 32 patients who undergo Caesarean section.

Before the Caesarean section was performed, there were several laboratory tests, one of which was a hemoglobin (Hb) test[4]. Hemoglobin consists of four globin protein subunits, each of which has one polypeptide chain and one heme group[5]. During pregnancy, there is a decrease in hemoglobin levels due to the increased need for food substances and the change in plasma volume is relatively greater than the increase in hemoglobin mass and red blood cell volume[6]. When pregnant women go into labour by Caesarean section, there is a risk of bleeding. This bleeding can be caused by the large number of blood vessels being cut and open during surgery, uterine atony, and bleeding at the place where the placenta is attached (placental bed)[7]. Therefore, it is necessary to check hemoglobin in order to prevent anaemia caused by a decrease in hemoglobin levels[8]. In Rahmawati's (2015) study, there was a decrease in hemoglobin levels after undergoing Caesarean section with an average reduction difference of 1.0381 g/dl so that it showed a significant difference between hemoglobin levels after and before cesarean section[9].

The hemoglobin examination in this study used the Cyanmethemoglobin method using the Drabkin's solution containing cyanide[10]. This method has a working principle, namely, by using a solution of reagents, hemoglobin derivatives other than verdoglobin in the blood will be converted into hemoglobin cyanide[11]. The Cyanmethemoglobin method is recommended because the standard solution is stable, easy to obtain and almost all hemoglobin is measured except sulfhemoglobin[12]. Cyanmethemoglobin method hemoglobin examination uses a sample of 20 µl, therefore accuracy for pipetting with a small volume is very important[13]. The research was conducted at RSIA Fauziah Tulungagung because the number of Caesarean section deliveries was an average of 32 cases in 1 month.

MATERIALS AND METHODS

This type of research is a quantitative comparative study, which is to determine the differences in hemoglobin levels in patients before the Caesarean section and in patients after Caesarean section in the laboratory room of RSIA Fauziah Tulungagung. Hemoglobin levels were examined at the clinical pathology laboratory of STIKes Hutama Abdi Husada Tulungagung.

The population and samples in this study were all patients who a cesarean delivery process at RSIA Fauziah Tulungagung in April 2018. The sample size of this study was 30 samples.

The sampling technique in this research is total sampling, where the number of samples is the same as the population. The hemoglobin (Hb) examination in this study used the Cyanmethemoglobin method. The sample used was venous blood with the addition of EDTA anticoagulants. The addition of EDTA anticoagulants aims to prevent blood clots by binding to calcium ions and precipitating calcium ions so as to prevent the formation of fibrinogen into fibrin (clot)[14]. The instruments and materials in this study were a spectrophotometer (microlab 300) and Drabkin solution. The content of Drabkin which contains Potassium Cyanide and Potassium Ferricyanide[15]. Drabkin is used to converting hemoglobin to Cyanmeth hemoglobin[16].

The data processing in this study used the Paired T-Test (the mean difference test for related samples). Paired T-Test is to test the effectiveness of a treatment on a variable quantity to be determined. The research data is then processed using the Statistical Package for the Social Sciences (SPSS) 16 software.

Hemoglobin examination with Cyanmethemoglobin method

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Put 5 ml of Drabkin's solution into a test tube, suck venous blood (EDTA) with a 0.02 ml (20 μl) pipette, remove excess blood that sticks to the pipette with cleaning paper or tissue, put the blood in a tube containing Drabkin's solution, mixed with the solution by shaking it slowly until the solution is homogeneous and allowed to stand for 10 minutes, it is read using a spectrophotometer as a blank used Drabkin's solution.

RESULTS AND DISCUSSION

RSIA Fauziah is a private type C maternal and child hospital located in Tulungagung Regency, East Java. This hospital provides services in the special health sector for mothers and children supported by specialist doctors and supported by other medical facilities. The distribution of samples by age is as follows :

Table 1. Frequency-based on the age of respondents who performed Caesarean section at RSIA Fauziah Tulungagung in April 2018

Age (Year)	Frequency	Percentage
20 – 35	28	93%
35– 40	2	7%
> 45	0	0%
Total	30	100%

From table 1 above shows the distribution of age respondents, pregnant women who underwent Caesarean section, the highest percentage was 93% in the 20-35 year age group totalling 28 respondents, 7% in the 35-40 year age group amounted to 2 respondents and 0% percentage in < 45 age group totalling 0 respondents. The high number of mothers giving birth by Caesarean section in the age group of 20-35 years is the optimal reproductive age group for mothers to get pregnant and give birth.

Table 2 Hemoglobin levels in pregnant women before and after Caesarean section at RSIA Fauziah Tulungagung

	Kadar Hb pre operasi Caesar (g/dl)	Kadar Hb pasca operasi Caesar (g/dl)
Mean	13,1	12,0
Median	12,7	11,8
Standart deviasi	1,8843	1,6139
Minimum	9,7	9,3
Maksimum	17,5	16,5

At the hemoglobin level before the Caesarean section, the mean value was 13.13 g / dl and the hemoglobin level after Caesarean section was obtained an average value (mean) of 12.06 g / dl. The standard deviation of hemoglobin levels before the cesarean section was 1.8843 and standard deviation of hemoglobin levels after the cesarean section was 1.6139.

Interpretation of the results in this test is that if P value> 0.05 then H_0 is accepted and H_1 is rejected, meaning that there is no significant difference between the two. Conversely, if the P-value <0.05 then H_0 is accepted and H_1 is accepted, meaning that there is a significant difference between the two. From this test, it was obtained a significant result of 2-tailed = 0.002 where P value <0.05, then H_0 was rejected and H_1 was accepted, meaning that there was a significant difference between the hemoglobin level before Caesarean section and hemoglobin after Caesarean section.

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Hemoglobin merupakan senyawa protein yang mengandung unsur non protein yaitu heme yang terdapat pada sel darah merah dan memberi warna darah merah[17]. Hemoglobin merupakan protein yang mengandung zat besi dan berperan membawa oksigen dari paru-paru ke seluruh jaringan tubuh[18]. Konsentrasi hemoglobin rendah merupakan indikator anemia[19]. Untuk mengetahui apakah seseorang itu mengalami anemia atau tidak, dapat diketahui dengan pengukuran kadar Hb. Penurunan kadar Hb dari normal, berarti kekurangan darah. Nilai normal untuk wanita dewasa 12-14 gr/dl, sedangkan laki-laki dewasa 14-16 gr/dl[20].

Pregnant women are prone to decreased hemoglobin levels. During pregnancy, the blood circulation in the mother's body will increase, namely an increase in blood plasma volume and red blood cell volume. The increase in plasma is higher than hemoglobin, causing a lower hemoglobin concentration. Low hemoglobin concentrations in pregnant women below 11 g / dL are considered anaemia in pregnant women[21]. Based on table 2, the average hemoglobin level in pregnant women before undergoing cesarean section at RSIA Fauziah is 13.1 g / dl. This shows that the hemoglobin levels in pregnant women are normal.

Major bleeding is one of the most common causes of death for mothers who undergo a caesarean section. Average less than 500 ml to more than 1000 ml estimates blood loss associated with cesarean section[22]. The bleeding is due to the large number of blood vessels that were cut and opened during a Caesarean sectionr[7]. Blood loss after cesarean section can reduce Hb levels in the blood. Checking hemoglobin levels before and after undergoing a cesarean section plays a role in overcoming the risk of bleeding during delivery and preventing the mother from experiencing anaemia.

CONCLUSIONS

Based on the results of the above research tests, there is a significant difference between the hemoglobin level before the Caesarean section and the hemoglobin results after Caesarean section. The difference is that there is a decrease in hemoglobin levels in the respondents after undergoing a Caesarean section.

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