THE EFFECT OF HEMOGLOBIN LEVELS AND PREGNANT WOMEN’S WEIGHT ON POSTPARTUM HEMORRHAGE IN TUBAN DISTRICT

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ABSTRACT

Background: In Tuban District, the highest maternal mortality was due to hemorrhage and preeclampsia. In 2006, the number of maternal deaths in Tuban Regency was 11 cases with details of 3 people during pregnancy, 2 people at during childbirth, and 6 people at postpartum period.

Objective: The objective was to analyze the effect of hemoglobin levels and pregnant women’s weight on postpartum hemorrhage in Tuban District in 2017.

Method: The type of this research was analytic observational research with cross sectional study approach. The samples were taken using random sampling technique with 74 patients.

Result: There were influence of hemoglobin levels and pregnant women's weight to the amount of blood at childbirth at Tuban Public Health Center in year 2017. R value equal to 0.572, it meant closeness relation between independent variable and dependent variable in medium category.

Conclusion: Hemoglobin levels and body weight in pregnant women significantly influenced on postpartum hemorrhage. Weight gain and hemoglobin levels during pregnancy might trigger a postpartum hemorrhage.

Keywords: hemoglobin, body weight, postpartum hemorrhage
1.0 INTRODUCTION

Maternal death was one of the most frequently debated issues. Maternal Mortality Rate (MMR) became one aspect in determining the progress of nation's health. Maternal deaths according to the limits of The Tenth Revision of the International Classification of Diseases (ICD-10) were female deaths occurring at the time of pregnancy or within 42 days of postpartum, independent from duration and location of pregnancy, might be caused by anything related to pregnancy or which aggravated the pregnancy and its treatment, but not deaths caused by accident or accident.

A lot of maternal deaths were caused by hemorrhage, either during pregnancy, during childbirth, or postpartum. Two thirds of all postpartum hemorrhage cases were experienced by mothers without previously known risk factors. Postpartum hemorrhage usually occurs suddenly and the patient can die in less than an hour if not treated promptly. Maternal mortality, directly or indirectly, is very influential on the quality of infant growth during perinatal period, even until childhood and school age. Maternal mortality can affect the quality and survival of infants and children in the future.

Currently, Indonesia still faces the problem of high Maternal Mortality Rate (MMR). MMR in East Java tended to decline in the last three years, but there was an increase again in 2016. This did not mean showing declining performance results, but there were support factors in terms of Maternal and Child Health (MCH) programs management as well as recording and reporting systems, which was getting better. Clinical skills improvement of field officers was still done by involving multi-stakeholders from Decreased Maternal and Infant Mortality Forum of East Java Province and the Districts/Cities. According to Intercensal Population Survey in 2016, the target for MMR was 305 per 100,000 live births. By 2016, East Java Province’s MMR reached 91.00 per 100,000 live births. This number has increased compared to 2015 which reached 89.6 per 100,000 live births.

Maternal Mortality Rate (MMR) refers to the number of maternal deaths associated with pregnancy, childbirth, and postpartum. The number of maternal deaths in Tuban District in 2016 was 11 cases with details of 3 people during pregnancy, 2 during childbirth, and 6 in postpartum. This number only decreased 1 case when compared to 12 cases by 2015.

Postpartum hemorrhage had a major role in high maternal mortality. There were many factors behind the incident, such as pregnant women’s weight. Many cases of obesity in women were a problem in pregnancy. Therefore, the objective of this study was to analyze the effect of hemoglobin levels and pregnant women's weight on postpartum hemorrhage during childbirth in Tuban District in 2017.

2.0 METHODS

This research used analytic observational research type with cross sectional study approach. The study was conducted by using secondary data, which was from data of pregnant mother
body weight and amount of bleeding written in medical record of patient giving birth at Tuban Health Center in 2017. The population of this research was 74 patients from 3 Health Centers for basic obstetric neonatus essential services in Tuban district which was randomly selected to serve delivery with standardized and accredited delivery aid protocols. Data were analyzed using multiple linear regressions with weight factor measured 3 times measurement during pregnancy with distribution once in every trimester.

3.0 RESULTS

The number of maternal deaths in Tuban District over the last five years could be seen in Figure 1.

![Graph of Maternal Mortality Year 2012-2016 in Tuban District](image)

**Figure 1.** Graph of Maternal Mortality Year 2012-2016 in Tuban District

Postpartum hemorrhage referred to this study was the condition of blood discharge during childbirth or for 2 hours postpartum with a volume of more than 500 cc. The condition was an indication to take appropriate action in the treatment of hemorrhage so as not to get in hazardous conditions and cause death. This research was conducted at basic obstetric neonatus essential services health center which had emergency handling facility so that in the case of this research data could be handled properly. 74 samples showed data in Table 1. The average number of postpartum hemorrhage gave as many as 310.1351 cc. The average hemoglobin levels in blood was 11.8514 gr%. The average body weight of respondents was 67.9284 kg.

**Table 1:** Average Number of Postpartum Hemorrhage Blood, Hemoglobin Levels, and Mother’s Weight

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLOOD</td>
<td>310.1351</td>
<td>101.69109</td>
<td>74</td>
</tr>
<tr>
<td>HB</td>
<td>11.8514</td>
<td>0.76628</td>
<td>74</td>
</tr>
</tbody>
</table>

Information:
BLOOD = the amount of postpartum hemorrhage blood
HB = hemoglobin levels
MW = mother’s weight
The linear regression anova table on weight and hemoglobin levels of pregnant women analysis on the amount of postpartum blood released could be seen in Table 2. The significance score of $0.003 < \alpha (0.05)$ was obtained. It meant there was at least 1 variable that affected the dependent variable.

**Table 2:** Anova Linear Regression in Mother's Weight and Hemoglobin Levels on The Number of Postpartum Hemorrhage Blood

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>138367.167</td>
<td>2</td>
<td>46122.389</td>
<td>5.237</td>
<td>0.003$^a$</td>
</tr>
<tr>
<td>Residual</td>
<td>616531.481</td>
<td>70</td>
<td>8807.593</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>754898.649</td>
<td>73</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: BLOOD
b. Predictors: (Constant), MW, HB

Information:
BLOOD = the amount of postpartum hemorrhage blood
HB = hemoglobin levels
BW = mother's weight

Influential variables could be seen in Table 3. Table 3 showed that hemoglobin and body weight of pregnant women could affect the amount of blood released during childbirth.

**Table 3:** Weight and Hemoglobin Levels of Pregnant Woman on The Number of Postpartum Hemorrhage Blood Variable Coefficient

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>-167.637</td>
<td>188.042</td>
<td>-0.891</td>
</tr>
<tr>
<td></td>
<td>HB</td>
<td>4.071</td>
<td>5.223</td>
<td>0.031</td>
</tr>
<tr>
<td></td>
<td>MW</td>
<td>7.377</td>
<td>3.264</td>
<td>0.420</td>
</tr>
</tbody>
</table>

Information:
BLOOD = the amount of postpartum hemorrhage blood
HB = hemoglobin levels
BW = mother's weight

### 4.0 DISCUSSION

According to World Health Organization (WHO), Maternal Mortality Rate (MMR) in pregnancy or childbirth in the world reached 515 thousand inhabitants every year. It means, every one minute, there was a mother who died caused by complications in pregnancy and childbirth in the household (Azwar, 2005 in Ermayani, 2012). The number of maternal deaths
in 2007 in Indonesia with postpartum hemorrhage as the leading cause of death was 392 people, consisting of 36.48% (143 people) due to anemia; 44.89% (176 people) due to hypertension; and 19.39% (73 persons) due to other reasons (Rusnah, 2007 in Rinawati, 2010).

Postpartum hemorrhage is something that may happen to anyone. Women's childbirth without risk can be experienced. Improved service quality continues to be done by improving the health workers quality in emergency handling.

Currently, postpartum hemorrhage treatment was done according to the cause. Based on its association with body weight and hemoglobin levels, postpartum hemorrhage could be caused by 2 things: the tearing of the birth canal and uterine atony. Tearing of the birth canal could be overcome by a series of actions called Bimanual Interna Compression (BIC), Bimanual Eksterna Compression (BEC), up to catheter condom tampon. The health worker/midwife at the research site had been trained so that the referral and maternal deaths due to postpartum hemorrhage could be prevented. Rupture of the birth canal could be dealt with through suture management with anesthesia so that still applied mother care affection.

4.1 The Effect of Mother’s Weight on Number of Postpartum Hemorrhage

Table 3 on the results showed that the significance value of weight influence on the amount of blood released during childbirth was 0.027 or less than the value of α (0.05). This showed that there was a significant influence between mother’s weight and post partum hemorrhage. This was also supported by several theories about the causes of postpartum hemorrhage.

Body weight was an easily measurable indicator of continuous Antenatal Care (ANC) checks. Normal weight gain in pregnant women ranges from 8-16 kg during pregnancy. Some of the things that caused excessive maternal weight changes during pregnancy include edema, macrosomia, gestational diabetes mellitus, and others. These things caused partus jams, ruptures of the birth canal, uterine atony, and so on so that there was postpartum hemorrhage.

4.2 The Effect of Hemoglobin Levels on Blood Amount on Postpartum Hemorrhage

In worldwide, the frequency of anemia in pregnancy was quite high, ranging from 10% to 20%, whereas the frequency of pregnant women with anemia in Indonesia was relatively high at 63.5%. Food deficiency played a very important role in the onset of anemia so it could be understood that the frequency was higher in developing countries than in developed countries (Prawirohardjo, 2007 in Rinawati, 2010). Maternal deaths in developing countries were associated with anemia in pregnancy. Anemia in pregnancy was a maternal condition with hemoglobin (Hb) levels below 11 gr% in the first and third trimesters and Hb levels <10.5 gr% in the second trimester. Anemia in pregnant women was caused by iron deficiency, deficiency of folic acid, infections, and blood disorders (Atikah, 2007 in Rinawati, 2010).

The above theory was consistent with the result of the statistical test shown in Table 3. The significance value of the hemoglobin level variable on the amount of postpartum hemorrhage blood was 0.014. This value was smaller than the value of α (0.05) so it could be concluded that hemoglobin levels significantly affected the amount of blood in postpartum hemorrhage.
5.0 CONCLUSION AND RECOMMENDATION

Body weight and hemoglobin levels in pregnant women significantly influence the amount of blood in postpartum hemorrhage. To reduce the risk of postpartum hemorrhage, pregnant women were expected to have an antenatal care or ANC at least 4 times during pregnancy and assisted by health workers for detects a high risk of bleeding, especially in overweight and anemic mothers during pregnancy.

Subsequent research is expected to conduct weight and hemoglobin studies on postpartum hemorrhage using primary data, postpartum hemoglobin measurements performed by trained health personnel, and the measurement of infant's birth weight by the health worker no later than 2 x 24 hours after the baby is born so that the association estimation obtained could describe the population better. Health workers should also be trained to administer postpartum hemorrhage.

Other recommendations are:

1. Areas prone to the occurrence of pneumonia cases are expected to be a concern for the government as well as people in the region.
2. It is expected that the puskesmas can improve and maintain the posyandu program that is the improvement of people's nutrition in integrated baby service post.
3. Factors that can affect the high cases of pneumonia should be more attention and improved, so that cases can be reduced. And prevention of pneumonia can start from the family scope.

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DECLARATION

Author(s) declare that all works are original and this manuscript has not been published in any other journals. There was no financial support of any organization for this work.

REFERENCES


Depkes RI. *Standard Pelayanan Kebidanan*. Jakarta. 2005


Rustam, M. *Sinopsi Obstetric*. Jakarta: EGC. 1998


Varney H. *Buku Saku Bidan*. Jakarta: EGC. 2001
