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Relationship between Risk Factors and The Incidence of Postpartum Hemorrhage in Women Giving Birth

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ABSTRACT

The aim of this study was to determine the proportion and risk factors associated with the incidence of postpartum hemorrhage in women giving birth at the Tangerang General Hospital. This research is a quantitative research with a cross sectional approach. This research is combined with qualitative data from in-depth interviews with sources who can contribute to the problem of postpartum hemorrhage. The population in this study was all mothers giving birth at the Tangerang Regional General Hospital in 2022. The sample in this study was a portion of the mothers who gave birth at the Tangerang District Hospital, over a period of one year, namely from January to December 2022, totaling 200. Method of sampling will be carried out using a simple random sampling method. This study concluded that mothers who experienced postpartum hemorrhage were 36.50%, while mothers who did not experience postpartum hemorrhage were 63.50%. Test results using a general linear multivariate model show that pregnancy spacing is the variable that has the greatest influence on the incidence of Postpartum Hemorrhage. Meanwhile, large fetus variables have the lowest influence on Postpartum Hemorrhage

Keywords: *Risk Factors, Postpartum Hemorrhage, Women Giving Birth, Anemia*

1. INTRODUCTION

Postpartum hemorrhage is defined more than 500 ml of blood bleeding following vaginal delivery. postpartum hemorrhage is considered severe when blood loss exceeds 1,000 ml after a vaginal delivery, or results in signs or symptoms of circulating blood volume instability [1]. It is a major cause of maternal mortality especially in developing countries and is the cause of 25% of maternal deaths worldwide [2]. Despite its ubiquity, the root causes of postpartum hemorrhage remain obscure [3]. It is the most common maternal morbidity even in highly resourced countries and is increasing in incidence [4]. Sequelae of postpartum hemorrhage include hypotension, anemia, and fatigue, which can make breastfeeding and maternal care of the newborn more difficult [5].

An increase in the prevalence of known maternal and obstetric risk factors for postpartum hemorrhage could play a role, but the supporting evidence from the published studies is limited. For example, in a Canadian study [6], induction of labor, augmentation of labor, and cesarean section partially explained the increasing rate of postpartum hemorrhage. These findings may indicate that women undergoing these interventions need closer monitoring for severe postpartum hemorrhage in the early postpartum period.

Several risk factors for postpartum hemorrhage are known, such as multiple pregnancy, operative delivery and chorionamnionitis, however postpartum hemorrhage may occur among patients with no known risk factors [7][8]. However, 20% of patients who develop postpartum hemorrhage have no risk factors, so providers must be prepared to treat it at every delivery [9]. There is little information on the magnitude and risk factors for postpartum hemorrhage. Common causes include uterine atony, trauma including genital tract injuries, placental retentions and failure of the blood coagulation system. Uterine atony is responsible for the majority (75%) of cases of postpartum hemorrhage [10].

The active management of the third stage of labor (AMTSL) is a preventive measure for postpartum hemorrhage and consists of the administration of exogenous oxytocin (Pitocin), control cord traction, and early cord clamping. However, there is

growing evidence of the adverse effects of exogenous oxytocin in normal maternal physiological changes during postpartum and an increased risk of postpartum hemorrhage in women who have received higher doses of exogenous oxytocin [11][12][13].

The physiological management of the third stage of labor has received increased attention from researchers. Many studies have been conducted to investigate the effects of early skin-to-skin contact (SSC) between the newborn and the mother and early breastfeeding on the prevention of postpartum hemorrhage through their effects on the duration of the third stage of labor and postpartum blood loss [14][15].

The maternal mortality rate in Tangerang Regency in 2020 was 38/100,000 KH and the number of infant deaths in Tangerang Regency was 203/1,000 KH. (Tangerang District Health Office, 2021). The most common cause of maternal death in Tangerang district is hemorrhage with a total of 10. This shows that postpartum hemorrhage needs serious attention, because postpartum hemorrhage is a problem that is very life-threatening for mothers. Based on a preliminary study conducted at RSUD Kab. Tangerang, the incidence of postpartum hemorrhage at the Tangerang District Hospital during 2021 was 1050 cases (29.9%) from 3513 deliveries. (Tangerang Regional Hospital medical record data). Therefore, the aim of this study was to determine the proportion and risk factors associated with the incidence of postpartum hemorrhage in women giving birth at the Tangerang General Hospital in 2022.

2. METHOD

This research is a quantitative research with a cross sectional approach. This research is combined with qualitative data from in-depth interviews with sources who can contribute to the problem of postpartum hemorrhage. The population in this study was all mothers giving birth at the Tangerang Regional General Hospital in 2022. The sample in this study was a portion of the mothers who gave birth at the Tangerang District Hospital, over a period of one year, namely from January to December 2022, totaling 200. Method of sampling will be carried out using a simple random sampling method.

Data collection was carried out by reviewing the medical records of mothers giving birth who were treated in the obstetrics room of Tangerang Regional Hospital in 2022. In order for the data collected to maintain its validity, before data collection a trial would be carried out on several medical records of mothers who gave birth in the birthing room of Tangerang Regional Hospital, so that If there is a double perception of the desired characteristics, previous revisions can be made.

3. RESULT

3.1. Univariate Analysis Result

The number of samples used was 200 postpartum mothers, 127 (63.50%) postpartum mothers did not experience bleeding, and the other 73 (36.50%) postpartum mothers experienced bleeding. Description of postpartum event data based on seven independent variables (Age, Parity, Pregnancy spacing, History of anemia, Long parturition, Number of fetuses, and Large fetus) obtained the following data distribution.

Table 1 Frequency Distribution of Postpartum Mothers at Tangerang Regional Hospital in 2022

Dependent Variable		Postpartum Hemorrhage			
		Yes		No	
		n	(%)	n	(%)
Mother's Age	< 20 years or > 35 years	47	64.38%	0	0.00%
	20 years - 35 years	26	35.62%	127	100.00%
Parity	1 child / > 4 children	73	100.00%	25	19.69%
	2 children – 3 children	0	0.00%	102	80.31%
Pregnancy Spacing	< 2 years	57	78.08%	0	0.00%
	> 2 years	16	21.92%	127	100.00%
History of Anemia	Anemia	73	100.00%	79	62.20%
	Not Anemic	0	0.00%	48	37.80%

Long Parturition	Long Parturition	18	24.66%	0	0.00%
	No long labor	55	75.34%	127	100.00%
Number of Fetuses	Twin	12	16.44%	0	0.00%
	Single	61	83.56%	127	100.00%
Large fetus	Macrosomia	9	12.33%	0	0.00%
	Not Macrosomia	64	87.67%	127	100.00%

Table 1 showed that the majority of postpartum mothers were aged 20 – 35 years (153 or 76.50%), and 47 postpartum mothers (23.50%) were aged < 20 years / > 35 years. Based on the data, of the 73 postpartum mothers who experienced bleeding, 47 postpartum mothers (64.38%) were in the age range < 20 years / > 35 years and 26 other postpartum mothers (23.50%) were in the age range 20 - 35 years. This data shows that all postpartum mothers aged < 20 years / > 35 years experienced postpartum bleeding.

Postpartum mothers with parity in mothers with 2 - 3 children were recorded at 102 (51%), while 98 (49%) occurred in mothers with 1/> 4 children. Based on data, of the 73 postpartum mothers who experienced bleeding, all of them occurred in postpartum mothers who had 1/> 4 children. Pregnancy spacing > 2 years was recorded in 143 postpartum mothers (71.50), while 57 (28.50%) < 2 years. Based on the data, of the 73 postpartum mothers who experienced bleeding, 78.08% (57 postpartum mothers) had a pregnancy interval of < 2 years, while 21.92% (16 postpartum mothers) had a pregnancy interval of > 2 years.

There were 152 (76%) respondents who had a history of anemia, while the other 48 (24%) had no history of anemia. Based on data, of the 73 postpartum mothers who experienced bleeding, all of them (100%) occurred in respondents who had a history of anemia. Table 1 also shows that 18 (9%) postpartum mothers experienced long labor, while the other 182 (91%) did not experience this. Based on data, of the 73 postpartum mothers who experienced bleeding, 55 postpartum mothers (75.34%) did not experience long labor, 18 other people (24.66%) experienced long labor. So, all postpartum mothers who experience long labor experience postpartum bleeding.

Based on the number of fetuses, 12 postpartum mothers (6%) had twin fetuses, while 188 (94%) had single fetuses. Based on data, of the 73 postpartum mothers who experienced bleeding, 12 postpartum mothers (16.44%) came from those who had twin fetuses, while 83.56% (61 postpartum mothers) experienced it from those who had single fetuses. Based on fetal size, it was recorded that 9 (4.50%) postpartum mothers had macrosomia, while 191 (95.50%) did not have large fetuses. Based on data, of the 73 postpartum mothers who experienced bleeding, 9 postpartum mothers (12.33%) came from those who had large fetuses, while 87.67% (64 postpartum mothers) did not have large fetuses.

3.2. Multivariate Analysis Results

Interpretation of the results of multivariate analysis is strengthened by first testing the relationship between each independent variable and the dependent variable. Testing using crosstab correlation analysis obtained the following results.

Tabel 2. Analisis Hubungan Antara Variabel Bebas dengan Terikat

Variable	Koefisien korelasi	Nilai *p*
Mother's Age	0,590	0,000
Parity	0,612	0,000
Pregnancy Spacing	0,640	0,000
History of Anemia	0,392	0,000
Long Parturition	0,383	0,000
Number of Fetuses	0,316	0,000
Large fetus	0,275	0,000

The results of the analysis of the relationship between Mother's Age and Postpartum Hemorrhage obtained a p-value of 0.000 (< α=0.5), so it can be said that there is a relationship between Mother's Age and Postpartum Hemorrhage. The direction of the relationship is positive (0.590) with a moderate level of relationship. The results of the analysis of the relationship between Parity and Postpartum Hemorrhage obtained a p-value of 0.000 (< α = 0.5), so it can be said that there is a relationship between Parity and Postpartum Hemorrhage. The direction of the relationship is positive (0.612) with a strong level of relationship.

The results of the analysis of the relationship between Pregnancy Spacing and Postpartum Hemorrhage obtained a p-value of 0.000 (< α = 0.5), so it can be said that there is a relationship between Pregnancy Spacing and Postpartum Hemorrhage. The direction of the relationship is positive (0.640) with a strong level of relationship.

The results of the analysis of the relationship between History of Anemia and Postpartum Hemorrhage obtained a p-value of 0.000 (< α = 0.5), so it can be said that there is a relationship between History of Anemia and Postpartum Hemorrhage. The direction of the relationship is positive (0.392) with a weak level of relationship.

The results of the analysis of the relationship between Long Parturition and Postpartum Hemorrhage obtained a p-value of 0.000 (< α = 0.5), so it can be said that there is a relationship between Long Parturition and Postpartum Hemorrhage. The direction of the relationship is positive (0.316) with a weak level of relationship.

The results of the analysis of the relationship between Large fetus and Postpartum Hemorrhage showed a p-value of 0.000 (< α=0.5), so it can be said that there is a relationship between Large fetus and Postpartum Hemorrhage. The direction of the relationship is positive (0.275) with a weak level of relationship. Next, to see the independent variables that have the greatest influence, a Multivariate Geberal Linear Model test is carried out. Following are the test results.

Table 3. Test Results with Multivariate General Linear Model

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Postpartum Hemorrhage	Mother's Age	19.215	1	19.215	227.281	.000
	Parity	29.901	1	29.901	294.862	.000
	Pregnancy Spacing	28.262	1	28.262	447.913	.000
	History of Anemia	6.622	1	6.622	43.911	.000
	Long Parturition	2.818	1	2.818	41.148	.000
	Number of Fetuses	1.253	1	1.253	24.734	.000
	Large fetus	.705	1	.705	17.681	.000

The calculation results in table 3 above show that the independent variable that has the greatest influence on the incidence of Postpartum Hemorrhage is Pregnancy Spacing with a value of F = 447.913. It has been previously explained in table 1 that 78.08% of postpartum hemorrhages occur in pregnancies less than 2 years apart. Table 3 also shows that Large Fetus is the independent variable that has the least influence on 1 incident of Postpartum Hemorrhage. It has been previously explained in table 1 that 87.67% of Postpartum Hemorrhages occur in pregnancies with fetuses that are not large.

4. DISCUSSION

4.1. Incidence of Postpartum Hemorrhage

Based on the research results, it was found that 73 mothers (36.50%) experienced postpartum hemorrhage, while 127 mothers (63.50%) did not experience postpartum hemorrhage. The most common factor contributing to the increasing rate of Postpartum Hemorrhage is uterine atony, which is known as atonic Postpartum Hemorrhage. Between 75 and 80% of Postpartum Hemorrhage's result from uterine atony [16] [17]. This condition develops when the uterine musculature loses its tone. Several factors predispose women to uterine atony, including uterine leiomyomata, multiple gestations, oxytocin augmentation, over-distention of the uterus, chorioamnionitis, prolonged labor, grand multiparity, fetal macrosomia, polyhydramnios, precipitous labor, and exposure to magnesium sulfate regiments and halogenated anesthetics [18].

Parity is the condition of giving birth to children, either alive or dead, but not abortion, regardless of the number of children, and multiple births are only counted as one parity. Parity is the number of pregnancies that are capable of producing a fetus that is capable of surviving outside the womb or a gestational age of 28 weeks [19]. Women with high parity are at risk of experiencing uterine atony, which, if not treated properly, will result in postpartum bleeding. This condition also makes it more likely for mothers to undergo labor induction and cesarean section and be referred to other health service facilities.

The risk factors for severe post partum hemorrhage were maternal age < 18 years, a previous cesarean section, history of post partum hemorrhage, conception through IVF, pre-delivery anemia, stillbirth, prolonged labor, placenta previa, placental abruption and macrosomia. Previous cesarean section, pre-delivery anemia, stillbirth, prolonged labor and macrosomia were associated with severe post partum hemorrhage, consistent with the results of previous reports [26] [27] [28].

4.2. Relationship between independent variables and dependent variables

Test results using a general linear multivariate model show that pregnancy spacing is the variable that has the greatest influence on the incidence of Postpartum Hemorrhage. Meanwhile, large fetus variables have the lowest influence on Postpartum Hemorrhage.

This research found that postpartum mothers who had a history of anemia all experienced Postpartum Hemorrhage. These results are in accordance with the theory which states that reduced hemoglobin levels during pregnancy are one of the risk factors associated with the occurrence of uterine atony [29]. Hemoglobin is needed by the body for various cell metabolisms in terms of transporting oxygen throughout the body, including to the uterus. The uterus requires strong contractions during labor, to stop bleeding due to detachment of the placenta from its attachment to the endometrium during pregnancy and for uterine involution during labor. Hemoglobin levels < 11 gr/dl will result in weakened uterine muscle contractions during labor, thereby increasing postpartum bleeding and being a potential cause of morbidity and mortality for mother and baby.

The results of previous research using the ANC visit variable on the incidence of anemia in pregnant women showed that there was a significant influence between ANC visits on the incidence of anemia in pregnant women in the Medan Johor Health Center Work Area in 2019, p-value = <0.001 and the OR value was 8. 1 shows that ANC visits are less than four times the estimated risk for the incidence of anemia of eight times compared to four ANC visits [20]. Research by Sari in Sekip Village, Lubuk Pakam District, Deli Serdang Regency in 2016, the OR value was 12.50, indicating that irregular ANC visits have an estimated risk of anemia of twelve times compared to regular ANC visits [21].

Management of anemia during pregnancy is not only completed by the number of visits by pregnant women in accordance with the program implemented by the government, but also by emphasizing the quality of health workers. Research conducted at Jendral Ahmad Yani Regional Hospital in 2013 showed that some pregnant women's knowledge was still low. It can be seen from the interview results that pregnant women did not know what hemoglobin was. All the respondents knew was that when they were examined they were diagnosed with anemia [22] [23]. Efforts that have been made to increase ANC visits include: 1) ANC visit application; 2) Assistance for pregnant women, especially during the new normal period; 3) Door to door implementation of ANC, etc. However, this still cannot increase the interest of pregnant women in making ANC visits [24].

Antenatal anemia affecting up to 25% of pregnant women, initiatives may be necessary to promote anemia correction [26]. Anemia is a condition in which a person's hemoglobin, hematocrit and erythrocyte levels are lower than normal. Anemia is a condition of decreased hemoglobin concentration in red blood cells, which causes problems in transporting oxygen in the body. Pregnant women have normal Hb levels if ≥ 11 gr/dl. Anemia is more common during pregnancy. This is because during pregnancy nutritional needs increase and changes occur in the blood and bone marrow [25]

Seeking a preventive treatment for PPH is important because the prevalence rate has remained unchanged with current treatments. The incidence of atonic PPH is greater in low-income, third-world populations that do not have access to medication to stop hemorrhages [26]. Endogenous oxytocin does not have the adverse effects that exogenous oxytocin has, and the need for a readily available, low-cost treatment is great [30]. Physiological management, such as SSC and BF, can be utilized to promote oxytocin production, which may ultimately contribute to a reduction in or the prevention of PPH [31].

Previous univariate and bivariate test results showed that the proportion of postpartum mothers who had twin fetuses and mocrosomia fetuses was very small so that the results of the multiple logistic statistical test showed that there was no significant relationship between these two variables and postpartum hemorrhage.

5. CONCLUSION

This study concluded that mothers who experienced postpartum hemorrhage were 36.50%, while mothers who did not experience postpartum hemorrhage were 63.50%. The results of the study also showed that mothers aged 20 - 35 years had 2 - 3 children had a pregnancy interval of > 2 years (71.50%), suffered from anemia (76.0%). %), did not experience prolonged labor (91.0%), had a single fetus and mothers who did not have macrosomia fetuses. Test results using a general linear multivariate model show that pregnancy spacing is the variable that has the greatest influence on the incidence of Postpartum Hemorrhage. Meanwhile, large fetuses have the lowest variable influence on Postpartum Hemorrhage.

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