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Characteristics of Mothers Before and During Pregnancy Causing Postpartum Hemorrhage in Surabaya, Indonesia

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ABSTRACT

Postpartum hemorrhage (PPH) is one of the direct causes of maternal mortality with the highest percentage. Postpartum hemorrhage is the bleeding that occurs due to the blood loss of 500 ml or more from the reproductive organs after labor. The objective of this present research was to understand the characteristics of mothers before and during pregnancy that induce postpartum hemorrhage in Surabaya. The research method employed was a control case design consisting of 180 postpartum mothers, being analyzed using a multinomial logistic regression. The research was conducted in Soewandi Hospital and Haji Hospital Surabaya. The research results revealed that characteristics of mothers before pregnancy causing the incidence of postpartum hemorrhage were as follows: a) Age < 20 and > 35 (66.7%), b) multi-parity (61.14%), pregnancy spacing $\leq$ 24 months (70.4%), d) possessing postpartum hemorrhage history (93.3%) and e) suffering from anemia (80.8%). Characteristics of mothers during pregnancy were among others : Double pregnancy (71.4%), preeclampsia (79.5%) and obesity (70.6%). It is expected that the cadres of health staffs recognize the characteristics of these mothers and are able to detect earlier any postpartum hemorrhage that occurs to pregnant women so that earlier prevention actions may be taken.

Keywords: causing factor; before and during pregnant; postpartum hemorrhage

INTRODUCTION

Background

Postpartum hemorrhage (PPH) is one of the direct causes of maternal mortality and this occupies the highest position in percentage (28%). Postpartum hemorrhage is any bleeding that occurs due to the loss of blood of 500 ml or more from the reproductive organs after two labors. In various countries, a quarter of maternal mortality is caused by hemorrhage where its proportion is around 10-60%[(1)]. At the national level, the maternal mortality is mainly induced by labor complications 45%, retained placenta 20%, birth canal tear 19%, prolonged labor 11%, hemorrhage and eclampsia, 10% each, childbirth complications 5%, and childbirth fever 4%[(2)]. Meanwhile, the data at Soewandhie Hospital Surabaya in January - December 2017, the number of deliveries was 3330 deliveries, with 108 people (3.24%) of post partum hemorrhage and 3 (2.8%) who died.

The characteristics of mothers leading to the occurrence of postpartum hemorrhage before pregnancy covered age, mass body index, and postpartum hemorrhage history. However, the characteristics of mothers causing postpartum hemorrhage during pregnancy included age, body mass index, postpartum hemorrhage history, double pregnancy, placenta previa, postpartum hemorrhage, and antibiotics use. Meanwhile, characteristics of mothers that may cause the incidence of postpartum hemorrhage during labor involved anterior placenta previa, major placenta previa, the increase in the body temperature of $>37^0$, chorioamnionitis, and placental retention[(3)].

A mother suffering from hemorrhage may die in less than one hour. The condition of such a maternal mortality as a whole is worsened by three tardiness: decision making, reaching the place of reference, and getting a proper aid in the health facility[(2)]. Although a woman may survive after postpartum hemorrhage, but she will have heavy anemia and will suffer from prolonged health problems[(4)].

The effect from the postpartum hemorrhage is greatly dangerous, so that it is vital to prevent it from mothers' pregnancy. A good pregnancy care may avoid this incidence. Mothers coming to the doctors to have pregnancy care will be checked whether there are some pregnancy irregularities or complications, so that

characteristics of mothers with risks of suffering from postpartum hemorrhage may be identified. Being late to give a reference to this health facility occurs since the providers of the health services are incapable of detecting earlier the characteristics of mothers with risks from suffering from postpartum hemorrhage[5]. Therefore, health staffs should be familiar with the characteristics of pregnant women who are at risks in getting postpartum hemorrhage. Characteristics of pregnant women that lead to the incidence of postpartum hemorrhage should be identified, so that some preparations may be made before pregnancy[6]. Significant hemorrhage may also threaten the life and this may occur although there is no risk factor and warning. All nurses and facilities involved in caring pregnant women should possess clear plans to prevent and manage postpartum hemorrhage.

Purpose

The objective of this present research was to understand the characteristics of mothers before and during pregnancy with risks that cause postpartum hemorrhage.

METHODS

This research was conducted with a case-control design consisting of 180 postpartum mothers, being analyzed using a multinomial logistic regression Held in Dr. M. Soewandhie Hospital and Haji Hospital. The time needed for the study was 8 months. The population was all post partum mothers with a diagnosis of post partum hemorrhage as the case group and the control group were pregnant women who did not experience post partum hemorrhage. The sample in this study were some post partum mothers diagnosed with post partum hemorrhage and normal post partum mothers who gave birth at Soewandie Hospital and Haji Hospital Surabaya.

The sampling technique was probability sampling with a systematic random sampling method by waiting for the arrival of respondents. The estimation of the sample size in this research was as follows:

$$n = \frac{N.Z^2_{1-\alpha/2}.\ P(1-P)}{d^2(N-1) + Z^2_{1-\alpha/2}\ P\ (1-P)}$$

It was found that the sample size in this study was the case group 89 people and the control group 91 people. In this study, it was divided into independent and dependent variables, a) Independent variables: The independent variables in this study were: age, parity, gestational distance, body mass index, anemia, history of post-partum hemorrhage, multiple pregnancy, placenta previa, preeclampsia, antibiotic use, increased body temperature, chorioamnionitis, and retention of placenta, b) Dependent variables: The dependent variable in this study was post partum hemorrhage in pregnant women.

Retrieval and data collection by means of interviews and physical examinations and viewing documents from medical records in hospitals in Surabaya. The instrument used was a questionnaire sheet made by the researcher. Data analysis for categorical data included the frequencies, percentages[7] and the mean score in each group[8], then statistical tests are carried out using multinomial logistic regression tests.

RESULTS

The research results revealed that characteristics of women before pregnancy suffering from postpartum hemorrhage were as follows: a) Age < 20 and > 35 (66.7%), b) multi-parity (61.14%), pregnancy spacing ≤ 24 months (70.4%), d) possessing postpartum hemorrhage history (93.3%) and e) suffering from anemia (80.8%). Characteristics of mothers before pregnancy causing the occurrence of postpartum hemorrhage are presented in Table 1.

Table1 1. The Distribution of characteristics of postpartum mothers visiting health services for medical examinations based on factors before pregnancy

No	Characteristics	Category	Postpartum mother with PPH		Normal postpartum mother	
			f	%	f	%
1	Age	<20 and > 35 years	34	66.7	17	33.3
		20 – 35 years	55	42.6	74	57.4
2	Parity	>1	62	61.4	39	38.6
		1	27	34.2	52	65.8
3	Pregnancy	≤ 24 months	38	70.4	16	29,6
	distancing	> 24 months	51	40.5	75	59.5
4	Hemorrhage history	History exists	14	93.3	1	6.7
		No history exists	75	45.5	90	54.5
5	Anemia	Yes	63	80.8	15	19.2
		No	26	25.5	76	74.5

Characteristics of mothers suffering from postpartum hemorrhage based on the factors during pregnancy were as follows:

Table 2. The Distribution of factors during pregnancy

No	Characteristics	Category	Postpartum mother with PPH		Normal postpartum mother	
			f	%	f	%
1	Double Pregnancy	Yes	5	71.4	2	28.6
		No	84	48.6	89	51.4
2	Placenta Previa	Yes	0	0	1	100
		No	89	100	90	50.3
3	Preeclampsia	Yes	35	79.5	9	20.5
		No	54	39.7	82	60.3
4	Use Antibiotics	Yes	5	50	5	50
		No	84	49.4	86	50.6
5	Obesity	Yes	36	70.6	15	29.4
		No	53	41.1	76	58.9

DISCUSSION

High parity causes risks of complications during pregnancy, labor, and childbirth. On the basis of the research results of 180 postpartum mother, there were 47 postpartum mothers (29.4%) with parity risk. Each pregnancy, the uterus is enlarged, and the muscles of the uterus are stretched during the nine-month pregnancy. As a result of the stretch, the elasticity of the muscles of the uterus is not recovered like the one before pregnancy after labor. The more a mother is pregnant and gives birth, the more the elasticity of the muscles of the uterus is disturbed, as a result, the uterus does not contract perfectly (uterine atony/uterine hypotonia) and this results in postpartum hemorrhage[9]. Uterine atony is a myometrial failure to contract after labor so that the uterus is in the condition of being fully relaxed, widening, being soft, and not being able to do its occlusion function of the blood vessels. This uterine atony generates hemorrhage. Hemorrhage in the uterine atony comes from the opened blood vessels in the place where the some or all placenta was adhered to[10].

The fatter a person is, the more blood she has, meaning that this causes the work of the heart is harder. This may increase the risk of the incidence of postpartum hemorrhage[11]. A weight gain influences the cause of postpartum hemorrhage to a mother in labor. Women with a body mass index of more than 30 in the early pregnancy tend to be in risks for postpartum hemorrhage. The estimation of the increase in the risk of postpartum hemorrhage before pregnancy according to Robson is two and a half times, while during the antenatal examination, the risk is one and a half times.

When the pregnancy interval is too short (< 2 year), the uterus does not have enough time to recover physiologically due to the tense of the previous pregnancy. The uterus condition in the short pregnancy spacing has not been maximally able to give nutrient reserves for the mother and the fetus, so that the mother experiences nutritional disorders and anemia and impaired fetal development. A mother with nutritional deficiency and anemia during pregnancy may cause uterine atony after labor so that hemorrhage will occur. The results of this research are in line with a research stating that the interval pregnancy of < 2 years is meaningfully correlated with the occurrence of uterine atony as the cause of postpartum hemorrhage with the OR of 6.467, p=0.011[12].

Preeclampsia in pregnancy is one of the factors supporting postpartum hemorrhage[13]. Women have greater risks to suffer from postpartum hemorrhage when they are pregnant they experience preeclampsia or have suffered from hypertension for more than 4 years[14].

In Suwondo Hospital in Kendal it was found that a mother in labor with preeclampsia history tended to have postpartum hemorrhage[15] and a research in RSUP Dr. Soeradji Tirtonegoro Klaten stated that there was a correlation between preeclampsia of pregnancy and the occurrence of postpartum hemorrhage with OR of 17.588[16]. This result is also in accordance with an idea proposed by another research that there was 50.9% cases of postpartum hemorrhage occurring in mothers with preeclampsia history[17]. In another researches, it is also stated that preeclampsia in pregnancy is a good predisposition factor to determine whether a woman possibly can experience postpartum hemorrhage[18].

Complications happening to postpartum mothers are affected by their health status either before or after the period of pregnancy. Therefore, each woman should be able to take care of her reproductive health throughout the life cycle because it will affect her condition when she is pregnant and gives birth. These research results are also in line with the one conducted by WHO in various countries about the incidence of hemorrhage in the labor in China China (0.17%) Vietnam (0.34%) Burma (0.40%) Thailand (0.93%) and Lesotho (1.14%)[1].

One of the predisposing factors of postpartum hemorrhage is the postpartum hemorrhage history in the previous labor. Mothers in labor with bad obstetric history have 5.37 times to have postpartum hemorrhage than those without such a history. In another relevant research conducted by Simarmata OS, et al., it was mentioned that a previous labor history influenced further labor complications with OR=5.52; 95% CI= 4.32-7.06; p=0.000. A placental retention history from the first labor is a strong risk factor of a retained placenta in the second labor with OR= 34.1; 95%CI 29.0–39.9; p=0.000. A previous postpartum hemorrhage history is also the main risk factor of the repeated postpartum hemorrhage with the range of 2.2 – 8.4[19].

Anemia in pregnancy is also called as "Potential Danger to Mother and Child". Anemia in pregnancy is caused by some additional needs for nutrients and also some blood addition and bone marrow. Excessive blood addition in pregnancy is commonly called hydremia or hypovolemia. However, a less addition of blood cells compared with the addition of its plasma induces blood tinning. The addition is inversely proportional namely blood plasm 30%, blood cells 18% and hemoglobin 19%. In the body, the number of the red blood cells can be low. It may also happen to the count of the hemoglobin in the red blood cells, if the amount of the two is low, this condition is called anemia.

Anemia in pregnancy is mostly brought about by the intake of less iron element contained in foods due to reabsorption or use disturbances or too much iron substance that leaves the body because of for instance hemorrhage. Postpartum anemia leads to a wound that is difficult to heal that may result in hemorrhage. Anemia in the afterbirth stage causes placental retention, and in the postpartum period it leads to the uterine atonia and sub uterine involution so that this results in postpartum hemorrhage[20]. The danger in the postpartum hemorrhage is that if an anemia exists it will weaken one's body endurance and may become the predisposing factor of puerperal infection, and if the blood loss is not stopped, it may result in death[10].

Anemia during pregnancy will affect the labor and post labor (childbirth period). The danger during labor may induce a distosia his, the stage one and stage two last long so that it may be exhausting, and often need an obstetric surgery, some disturbance in the stage three (afterbirth) that may be followed by placental retention and PPP because of the uterine atonia, and in the stage four, secondary PPP and uterine atonia may occur. Henceforth, in the effort to prevent anemia in pregnant mothers, some supplements of Fe tablets should still be provided, seeing the low socio-economic condition and the education level of most Indonesian people, especially those in rural areas.

CONCLUSION

The risk factors before pregnancy which are postpartum hemorrhage risk factors are as follows: Age < 20 and > 35 years, pregnancy distancing of less than 24 months, postpartum hemorrhage history and anemia. The risk factors during pregnancy which are postpartum hemorrhage risk ones are: Double pregnancy, preeclampsia, and obesity.

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