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Relationship of maternal parity with pre-eclampsia

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Abstract--Background : Maternal mortality is an important indicator to assess the level of welfare of a country and the health status of women. The direct causes of maternal death were bleeding 28%, eclampsia 24%, infection 11%, puerperal complications 8%, and prolonged labor 5%. Pre-eclampsia is one of the causes of maternal death. One of the risk factors for pre-eclampsia is parity. The incidence of pre-eclampsia in Singkawang city Hospital was 82 cases out of 1,591 deliveries. Research Objectives : To determine the relationship between maternal parity and the incidence of pre-eclampsia in Singkawang City Hospital Research Design : Using analytical observational method with *case control*. The population in this study were all mothers who gave birth at the Singkawang City Hospital as many as 1,591 people, of which 82 of these cases had pre-eclampsia. The control sample was taken using a *systematic sampling technique*. Data were analyzed by univariate analysis and bivariate analysis. Results : based on a study conducted on 60 respondents, 30 people (50%) had pre-eclampsia, and 30 people (50%) did not experience pre-eclampsia, 36 people (60%) were at risk parity. Bivariate analysis showed that P value = 0.018 with 95% CI and 0.05. Conclusion: There is a significant relationship between maternal parity and the incidence of pre-eclampsia. Thus, it is hoped that health workers will be more alert to pregnant women whose parity is classified as risky and further research can be carried out with a larger population and examine factors other than parity.

Keywords--parity, pre-eclampsia, maternal mortality.

Introduction

In developing countries, the reported frequency of pre-eclampsia ranges from 0.3% - 0.7%, while in developed countries the figure is lower at 0.05% - 0.1% (Amiruddin, 2008). Pre-eclampsia is a disease with signs of hypertension, edema and proteinuria arising from pregnancy. This disease generally occurs after the 20th week of pregnancy. Various factors that influence include primigravida, multiple pregnancy, hydatidiform mole, the number of maternal age above 35 years and diseases that accompany pregnancy including diabetes mellitus and obesity (Manuaba, 2008). Pre-eclampsia is one of the complications of pregnancy that is caused directly by pregnancy itself (Wiknjosastro, 2007). Pre-eclampsia is a pathological condition in pregnancy characterized by symptoms of hypertension, proteinuria, edema that occurs after the 20th week of pregnancy, but symptoms This can occur before 20 weeks if there is trophoblastic disease (Varney, 2004). According to Ayurai (2009), high-risk pregnancy is a condition that can affect the optimization of the mother and fetus in the pregnancy at hand. Mothers with high-risk pregnancies include: young primiparas with less than 16 years of gestational age, old primiparas with over 35 years of gestational age and secondary primiparas with the smallest child above 5 years. Parity 2 – 3 is the safest parity in terms of maternal mortality. Parity 1 and high parity (more than 3) have higher maternal mortality rates. Higher parity, higher maternal mortality. High parity is prone to parity because of high parity, many pathological obstetric events stem from high parity. In high parity, mild pre-eclampsia can occur because high parity often occurs in mothers aged over 35 years (Winkjosastro, 2007). Women who give birth to their second and third children include safe and low-risk deliveries. In conclusion, parity 1 and parity more than 3 are very susceptible to pre-eclampsia, but women who have parity 2 and 3 include safe and low-risk deliveries (Varney, 2004). In pre-eclampsia there is damage to the vascular endothelium, resulting in decreased Postacycline production which in normal pregnancy increases, activation of clotting and fibrinolysis, which is then replaced by thrombin and plasmin. Thrombin will consume antithrombin III resulting in fibrin deposition. Platelet activation causes the release of thromboxane (Tx A₂) and serotonin, resulting in vasospasm and endothelial damage (Oxorn, 2003). Decreased blood flow to the placenta results in impaired placental function. In hypertension for a long time, fetal growth is impaired; with shorter hypertension can occur fetal distress until death due to lack of oxygenation (Nugraha, 2007). According to Manuaba (2008) the heaviest complication due to severe pre-eclampsia is maternal and fetal death. Complications that usually occur in severe pre-eclampsia. In multigravida, due to frequent delivery and close pregnancy intervals, the repair of the endometrial wall is less than perfect. This causes disruption of blood vascularization in the endometrium and will continue in other organs, causing placental ischemia (Haryono, 2006).

Materials and Methods

This research is an analytical observational study with a *case control design*. In analytic observational research, the researcher tries to find the relationship between the independent variable (parity) and the dependent variable (preeclampsia incidence) whose analysis is to determine whether there is a

relationship between these variables, so it is necessary to develop a hypothesis (Notoatmodjo, 2005). Case-control design (Aday *et al.*, 2006) is an epidemiological study design that studies the relationship between exposure and disease between case and control groups based on their exposure status, in this study the effects are identified first and then the risk factors are studied *retrospectively*. The population in this study is the entire object of research (Suyanto, 2008). The population in this study were all mothers who gave birth in Singkawang City Hospital. The sample of this study were all pregnant women with severe pre-eclampsia who were recorded in *medical records* and delivery reports at the Singkawang City Hospital. The sample size in this study was 60 people. The sample selection was carried out on the case group and control group with a ratio of 1:1, the case group was 30 people and the control group was 30 people. Sampling in this study used 2 sample selection techniques. In the case group, a *random sampling*, namely the social gathering method. Meanwhile, for the control group, *asystematic sampling technique*, namely random sampling using intervals calculated by the number of deliveries minus the number of cases and the results divided by the number of controls. The sample is taken by making a list of elements or members of the population between 1 to "n" for example the result as an interval is x, then the sample affected is every multiple of that x. Data collection was carried out using secondary data obtained from daily report books, action books and registers of mothers giving birth in the delivery room of Singkawang City Hospital, then recorded the medical record number of mothers with pre-eclampsia events that met the criteria, namely mothers with one fetus pregnancy and conducted a search with the mother's medical record to see the necessary variables, namely maternal parity. The data collection instrument used in this study was a *checklist*. Hidayat (2007) research data analysis techniques are formulated by taking the following steps: *Editing, Coding, Tabulating, Data Entry* and Data Presentation.

Results

Univariable Analysis

In this study, univariable analysis was performed to obtain the frequency distribution. Performed on each variable from the results of the study. In general, this analysis only uses the distribution results and the percentage of each variable. To calculate the percentage use the formula (Arikunto, 2006):

Table 1.
Frequency Distribution of Respondents Based on Parity in Singkawang City Hospital

No	Parity	Respondent	Percentage (%)
1	Parity is more than 3	36	60
2	Parity 2 – 3	24	40
	Total	60	100

Based on the table below above it can be concluded that most of the respondents are parity more than 3 that is as many as 36 people (60%).

Table 2
Frequency distribution of respondents based on cases of pre-eclampsia in Singkawang City Hospital

No.	Cases of Pre-eclampsia	Respondents	Percentage (%)
1	Pre-Eclampsia	30	50
2	No Pre-eclampsia	30	50
	Total	60	100

Based on the table above, it can be concluded that some of the respondents were deliveries with placenta previa, as many as 30 cases (50%).

Bivariable

Analysis Bivariate analysis was used to see the relationship between 2 variables, namely the independent variable and the dependent variable using the *chi square* with a significance level of 95% and an error degree of 5% (0.05). The results of statistical analysis of the relationship between parity and the incidence of pre-eclampsia can be seen in the following table.

Table 3
Results of Bivariate Analysis of the Relationship of Parity with Pre-eclampsia

Parity	Labor				X ²	P Value
	Case		Control			
	N	%	n	%		
>3	23	77	13	43	5,625	0.018
2 – 3	7	23	17	57		
Total	30	100	30	100		

Based on the data in Table 4.3 can be obtained The conclusion is that mothers with parity more than 3 tend to have pre-eclampsia with 23 cases (77%) while mothers with parity 1 are 7 cases (23%).test analysis *chi square* with a significance level of 95% and a degree of error of 5% (0.05) show *P Value* = 0.018 with this *P Value* <0.05 which means that Ha is accepted. These results indicate that there is a significant relationship between parity and pre-eclampsia.

Discussion

Parity is the number of pregnancies that resulted in live babies, not the number of fetuses born, fetuses born alive or dead after viability was achieved does not affect parity. The parity of the respondents in this study was divided into two categories, namely at risk if the parity is more than 3 (multipara) and not at risk if parity 2 - 3 . parity is more than 3. This shows that most of the respondents are mothers with parity at risk (multipara). Parity more than 3 has a higher maternal mortality rate. High parity is prone to parity because of high parity, many pathological obstetric events originate from high parity (Winkjosatro, 2007). Pre-eclampsia is one of the leading causes of maternal and perinatal mortality in addition to bleeding and infection. One of the most influential risk factors for pre-eclampsia is parity. Parity 2 and 3 are the safest parity in terms of maternal mortality.

Based on the results of research conducted by researchers on 60 respondents, 36 people (60%) were respondents whose parity was at risk, 23 people (63.9%) of whom had pre-eclampsia. statistical test *Chi Square* it shows that there is a significant relationship between maternal parity and the incidence of pre-eclampsia where P Value = 0.018. Thus the hypothesis that there is a relationship between maternal parity and the incidence of Pre-eclampsia at the Regional General in Singkawang city hospital is statistically proven, so it can be concluded that parity of more than 3 (multipara) is a risk factor for the occurrence of placenta previa. In the control, it was found that 13 mothers who gave birth with parity were at risk of not suffering from severe pre-eclampsia. This means that severe pre-eclampsia is not only influenced by parity, but many other factors such as the distance between pregnancies that are too close, the low economic status and education level of most people. These three things are interrelated and play a very important role in determining the level of absorption and understanding of various information or health problems that arise both for themselves and for the surrounding environment. The results of the same study were found by Rossa at H. Adam Malik Hospital Medan in 2006 that pre-eclampsia can occur at any age during pregnancy, parity is higher in multipara parity and nullipara parity. The same research was also carried out by Amiruddin at RSU dr. FL. Tobing Sibolga in 2007 – 2008 that pre-eclampsia can occur with increasing maternal parity and the majority are found in multigravida. There is also a research that has been done by Zakiya in RSUD dr. Soedarso Pontianak in 2007 which states that mothers who have parity 1 and > 3 have a greater risk of developing severe pre-eclampsia than mothers who have parity 2 and 3. Diseases during pregnancy that are associated with age are increasing, one of which is severe pre-eclampsia in multigravida, due to frequent deliveries and close pregnancy intervals so that the repair of the endometrial wall is less than perfect. This causes disruption of blood vascularization in the endometrium and will continue in other organs, causing placental ischemia (Haryono, 2006).

Pre-eclampsia is also common in the first pregnancy and does not recur in subsequent pregnancies. In primigravida, the formation of blocking antibodies against placental antigens is not perfect, which is more perfect in subsequent pregnancies. occur *Antibodies blocking* causing mal adaptation of the immune system so that it can cause a lack of trophoblast invasion in the spiral arteri. The

failure of trophoblast cell invasion in the spiral artery walls makes the spiral arteries unable to dilate completely, resulting in a decrease in blood flow in the intervillous space in the placenta, resulting in placental ischemia. This will liberate toxic substances that will cause *oxidative stress*, which is a condition in which free radicals are more dominant than antioxidants. This can cause endothelial dysfunction that can occur on all endothelial surfaces of blood vessels in organs. In endothelial dysfunction, there is an imbalance in the production of substances that act as vasodilators so that there will be extensive vasoconstriction so that hypertension occurs and then if it is not detected early it will continue to severe pre-eclampsia (Haryono, 2006). The main changes found in pre-eclampsia are vascular spasm accompanied by salt and water retention. With a kidney biopsy, Winkjosastro (2007) found severe spasm of the glomerular arteriole. In some cases the lumen of the arteriole is so small that only one red blood cell can pass through it. When it is considered that arteriolar spasm is also found throughout the body, it is easy to understand that the increased blood pressure appears to be an attempt to overcome the increase in peripheral resistance in order to provide adequate tissue oxygenation. The cause of weight gain and edema caused by excessive accumulation of fluid in the interstitial space is unknown. It is known that pre-eclampsia has lower aldosterone levels and higher prolactin concentrations than normal pregnancies. Aldosterone is important for maintaining plasma volume and regulating water and sodium retention. In pre-eclampsia, blood vessel permeability has increased protein (Winkjosastro, 2007).

Severe pre-eclampsia causes reduced blood delivery to the placenta, ranging from mild to severe. For example, disrupting the kidneys of pregnant women, causing low birth weight babies, and giving birth prematurely. High blood pressure causes reduced blood delivery to the placenta. Of course this will reduce the supply of oxygen and food for the baby. As a result, the development of the baby becomes too late, and triggers early labor. This disease can also cause the placenta to separate suddenly from the uterus prematurely.

There are several ways for health workers to prevent the occurrence of pre-eclampsia: Quality and thorough antenatal examination, recognizing signs of mild pre-eclampsia, then given adequate treatment so that the disease does not become more severe, Must always be aware of the possibility of pre-eclampsia if any predisposing factors, Information about the benefits of rest and diet is useful in prevention. Rest does not always mean lying in bed, but daily work needs to be reduced, and more sitting and lying down is recommended. A diet high in protein and low in fat, carbohydrates, salt and moderate weight gain should be recommended, Looking for any signs of pre-eclampsia and treating it immediately if it is found and Terminating the pregnancy if possible at 37 weeks of pregnancy and above if after being treated The signs of pre-eclampsia cannot also be eliminated. According to Winkjosastro (2007), the factors for the occurrence of severe pre-eclampsia include age, parity, heredity and genes, previous history of severe pre-eclampsia, diet or nutrition and hyperplacental. In this study, researchers did not examine clearly these factors that may also affect the incidence of severe pre-eclampsia. So it is hoped that further researchers will be able to consider other factors that can lead to severe pre-eclampsia in order to complete this research and achieve better results.

Conclusions

Based on the results of the research that has been carried out, it can be concluded that: Some of the respondents are mothers with Pre-eclampsia, namely 30 people (50%), Some of the respondents are parity more than 3 or multipara, namely 36 people (60%) and there is a significant relationship between maternal parity and the incidence of pre-eclampsia with a $P Value = 0.018$.

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