Research

Factors Associated with Pregnancy Hypertension Risk

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A B S T R A K

Background: Hypertension in pregnancy needs to beware out because it can progress to more severe conditions, namely preeclampsia and eclampsia, thereby endangering the mother and the unborn baby. Risk factors in Hypertension in pregnancy are as age, education, occupation, parity, gestational age, economic factors, personal and family history of hypertension, obesity and activity/exercise.

Objective: This study aims to determine the risk factors for Hypertension in pregnancy in Deli Serdang Regency, North Sumatra.

Method: This study method used analytic observational with a cross sectional design. The study subjects were pregnant women at Public Health Center of Deli Serdang Regency who were considered the inclusion criteria and were selected as study subjects. The sampling technique by means of random sampling amounted to 164. Univariate analysis used to get an overview of the frequency distribution and percentage of the variables to be studied. Bivariate analysis used to determine the relationship between the independent variable and the dependent variable. The statistical test was Chi-Square with CI 95%. If p < 0.05. Multivariate analysis with logistic regression statistical tests to determine the influence of the independent variables on the dependent variable. Independent variables with p value <0.25 were included in the multiple logistic regression test model and selected using the enter method. The strength of the influence of the independent variable on the dependent variable is the Exp value (ß).

Result: The results of the study proved the results of Multivariate analysis, can be synthesized that the risk factors for pregnancy hypertension were influenced by factors: education (p=0.045), parity (p=0.047), gestational age (0p=0.040), personal history of hypertension (p=0.013), history family (p=0.049), and obesity (p=0.016). While the factors of age, occupation, economy and activity/exercise have no effect on risk factors for hypertension in pregnancy. Based on Exp value (B), the most influential factor was personal history of hypertension (p=0.013). This is indicated by the Exp value (B) = 2.710 which is in the interval 1.234 – 5.953, followed by obesity (p=0.016) with the Exp value (= 2.612) which is in the interval 1.192 – 5.725.

INTRODUCTION

The Maternal Mortality Rate (MMR) is an indicator to see the health status of women. According to the World Health Organization (WHO, 2020) maternal death is the death of a woman during pregnancy or 42 days after the end of pregnancy for any reason, It is regardless of the length of the pregnancy and the actions taken to end the pregnancy. The main causes of high MMR in Indonesia are disparities in access to quality health services, delays in getting help in emergency cases due to geographic

location and decision makers, inadequate knowledge and education on reproductive health, early detection and prevention of pregnancy complications are not yet optimal, and un integrated data. It is also cause health information systems, as well as overlapping regulatory systems.

The main cause of MMR in Indonesia until 2020 is still caused by the classic triad, namely bleeding, preeclampsia, and infection, and it is a continuing trend of increasing cases of preeclampsia. Ministry of Health data shows cases of maternal mortality due to preeclamation in 2015 amounted to 33.07%, higher than in 2010, which was 21.5% (Central of Statistics, 2016). The World Health Organization reports that 14% of maternal deaths globally are caused by hypertensive disorders of pregnancy. Based on the data obtained, Latin America and the Caribbean on 25.7%, Asia and Africa on 9.1%, sub-Saharan Africa on 16% which contribute to the cause of maternal death due to pregnancy hypertension (WHO 2020). Maternal deaths in Latin America due to complications that related to hypertensive disorders can be avoided by providing sufficient time for effective treatment, especially for complications such as physical activity and consumption of healthy foods (Guzik, 2021).

In Indonesia the prevalence of hypertension in pregnant women is (12.7%) and found (11.8%) who have been diagnosed with hypertension. Pregnancy hypertension is a contributor to the maternal mortality rate of 32.4% (Director General of Public Health 2019). The maternal mortality rate in Indonesia is far higher than the MMR in other Southeast Asian countries (WHO 2020). The increasing prevalence of hypertensive disorders in pregnancy and the associated risks for maternal and perinatal health and cardiovascular disease have attracted great attention in perinatal medicine and public health (Moet al, 2020). Government programs that have been carried out in an effort to reduce MMR/IMR in Indonesia are early detection of complications of pregnancy and childbirth, for example Monitoring of the local area of Maternal and Child Health, Mother Cohort, Implementation of Delivery Planning Program, MCH Handbook, but this program has not showed encouraging results for the prevention of complications of pregnancy and childbirth.

The program has not shown the expected results nationally. It can be seen from the coverage of handling complications of pregnancy and childbirth which has only reached 62.67% at the national and provincial levels. This data shows that it is very difficult to detect pregnant women with complications. The risk factor for gestational hypertension is one way of detecting complications during pregnancy, childbirth and the labor, which is an important health problem, if it does not treat, it can cause high maternal mortality (Sulyastini & Armini, 2020).

METHOD

The method in this study was analytic observational with a cross sectional design. Univariate analysis to get an overview of the frequency distribution and percentage of the variables to be studied. Bivariate analysis was to determine the relationship between the independent variable and the dependent variable. The statistical test was Chi-Square with CI 95%, If p < 0.05. Multivariate analysis with logistic regression statistical tests to determine the magnitude of the influence of the independent variables on the dependent variable. Independent variables with p value <0.25 were included in the multiple logistic regression test model and selected using the enter method. The strength of the influence of the independent variable on the dependent variable from the Exp value (ß). The subjects of this study were pregnant women in the working area of Public Health Center Deli Tua, Talun Kenas and Public Health Center in Biru-biru, Deli Serdang Regency, North Sumatra who met the inclusion criteria and the two of Public Health Centers were selected as study subjects. The number of subjects in this study was determined using the proportion of knowledge. Based on the measurement results used this formula, the minimum number of study subjects that needed is 154. To avoid dropping out of study subjects, so reserve study subject is taken of 10% of the minimum number of study subjects, so that number of the study subjects are 164 pregnant women.

RESULT DAN DISCUSSION

Univariate Analysis

Table 1 Risk Factors for Pregnancy Hypertension in Deli Serdang Regency

No	Risk factor	Frequency (f)	Percentage
	Age		
1	Not at risk (>20 and <35 years)	72	43.9
2	At risk (<20 and >35 years)	92	56.1
	Education		
1	Height (D3, S1 and S2)	73	54.5
2	Low (elementary, middle and high school)	91	55.5
	Work		
1	No Occupation/No Working	76	46.3
2	Work	88	53.7
	Parity		
1	Primipara	53	32.3
2	Multigravida	111	67.7
	Gestational age		
1	Trimester 1	75	45.7
2	Trimesters 2 and 3	89	54,3
	Economy		
1	Less	75	48.2
2	Support	89	54.3
	Personal history of hypertension		
1	Yes	79	48.2
2	No	85	51.8
	Family History of Hypertension		
1	Yes	67	40.9
2	No	97	59.1
	Obesity		
1	Yes	30	18.3
2	No	134	81.7
	Sport		
1	Inactive	72	43.9
2	Active	92	56.1

Source: Study Results (primary data processed)

Bivariate Analysis

Bivariate analysis included the relationship between age, education, occupation, parity, gestational age, economy, personal history of hypertension, family history of hypertension, obesity, and sports activity with the occurrence of gestational hypertension as shown in the following table:

Table 2: Bivariate Analysis of Relationship between Risk Factors and Pregnancy Hypertension

No	Parameter	Sig-p	OR	intervals	Conclusion
1	Age- hypertension	0.011	2,412	1267-4590	Significant
2	Education-hypertension	0.002	2,923	1533-5573	Significant
3	Occupation-hypertension	0.007	2,533	1336-4803	Significant
4	Paritas-hypertension	0.004	2,820	1428-5569	Significant
5	Maternal age hypertension	0.013	2,344	1242-4425	Significant
6	Economic Factors- hypertension	0.008	2,503	1318-4750	Significant
7	Self-history hypertension	0.007	2,556	1333-4901	Significant
8	History-Family hypertension	0.002	2,857	1502-5434	Significant
9	Obesity-hypertension	0.004	3,263	1510-7054	Significant
10	Exercise-Family hypertension	0.007	2,533	1336-4803	Significant

Table 2 shows that all risk factors are significantly associated with gestational hypertension.

Multivariate Analysis

Table 3: Multivariate Analysis of Pregnancy Hypertension Risk Factors

Variables in the Equation

		B	SE	Wald	df	Sig.	Exp(B)	95% CI for EXP(B) Lower	Upper
Step 1 [a]	KtgAge	.201	.425	.223	1	.637	1,222	.531	2,813
	Ktg_Education	.896	.447	4,017	1	045	2,449	1020	5,880
	Ktg_Occupation	.288	.459	.393	1	.531	1,334	.542	3,278
	Parity	.953	.480	3,951	1	047	2,594	1013	6,639
	Age_Pregnancy	.861	.419	4,221	1	040	2,366	1040	5,379
	Economy	.121	.453	071	1	.789	1,129	.465	2,741
	History_self	.997	.402	6.166	1	**013**	**2,710**	1,234	5,953
	Riw_family	.795	.403	3,890	1	.049	2.215	1.005	4,881
	Obesity	.960	.400	5,752	1	**.016**	**2,612**	1,192	5,725
	High	005	.456	.000	1	.991	1.005	.411	2,458
	Exercise	.527	.561	.883	1	.348	1694	.564	5,086
	Constant	-9,970	1,808	30,419	1	.000	.000		

a. Variable(s) entered on step 1: Age Ktg, Education Ktg, Occupation Ktg, Parity, Pregnancy Age, Economy, Personal_history, Family_history, Obesity, Height, Exercise.

Based on the findings of the multivariate analysis above, then it can be synthesized that the risk factors for gestational hypertension are influenced by many factors such as education (p=0.047), parity (p=0.047), gestational age (0p=0.040), early history (p=0.013), family history (p=0.049), and obesity (p =0.016). While the factors that have no effect are age, occupation, economy and sport/exercise. Based on the Exp (B) value, the factor that most influenced the risk of gestational hypertension was early history (p=0.013). It is indicated by the value Exp (B) = 2.710 which is in the interval 1.234 – 5.953, followed by obesity (p=0.016) with the value Exp (= 2.612) which is in the interval 1.192 – 5.725.

Based on the bivariate test, it showed that the value of p = 0.011 <0.05, so it can be concluded that age is at risk of gestational hypertension, where the more risk age, the greater the risk of gestational hypertension. OR value = 2.412 which is in the interval 1.267-4.590. Factor of age become one of important in undergo pregnant programme. Pregnancy at too old age or above 35 old and over very bad for the development of the fetus because women who are over 35 year, have organs already start slack off and cell egg no too good for pregnancy program. Pregnant in age over 40 year will give trend *downsyndrome* on their descendants. As in a study which said that the pregnancy planning paradigm holds that the woman determines whether and when pregnant women want to have children based on important life goals, like career or education and the women develop planning for how to achieve fertility goals, Arteagaetal (2019). The results of this study are in line with Ertiana's research (2018) on the relationship between age and the incidence of preeclampsia in pregnant women at the Kediri District Hospital, that there is a relationship between age and the incidence of preeclampsia in pregnant women at the Kediri District Hospital. Mothers with age are at risk for preeclampsia due to an increase in oxidative stress resulting in increased production of apoptotic and necrotic trophoblastic debris, which causes a systemic inflammatory reaction. This is indicated by the p value = 0.000 < α 0.05, the CC value = 0.376, the CI value = 2.962 – 10.718 and the OR value = 5.6.

Education, p value = 0.002 <0.05, so it can be concluded that education is significantly related to the risk of gestational hypertension, where the lower the education, the more likely to be at risk of gestational hypertension. OR = 2,923 which is in the interval 1,533-5,573. The results of this study are in line with Veftisia's research , (2018) on The Relationship between Parity and Mother's Education with the Incidence of Preeclampsia in the Semarang Regency Region, Respondents in this study were primipara 59 (53.6%), educated high school - academy/university 65 (59.1%), Mothers with primipara had a risk of experiencing pre-eclampsia during pregnancy by 0.83 times but It had no significant relationship (p=0.702), and mothers with basic education

(elementary-junior high school) had risk of experiencing pre-eclampsia during pregnancy by 4.1 times and it had a significant relationship (p = 0.004).

Occupational value p = 0.007 <0.05, so it can be concluded that work is significantly related to hypertension, where the lower the occupation, the more likely to be at risk of pregnancy hypertension. OR value = 2.533 which is in the interval 1.336-4803. The results of this study are in line with Ikhwani's research (2021) on The Incidence Rate of Preeclampsia in View of the Type of Work at dr. R. Soedjono Selong Hospital. The results of the study obtained that p value of 0.000 and it proved that there was a relationship between the incidence of preeclampsia and the type of work in. Dr. R. Soedjono Selong hospitals in 2019. It is hoped that Dr. R. Soedjono Selong Hospital can improve excellent nursing services in providing nursing care so that the complications of preeclampsia can be handled properly.

Parity, p value = 0.004 <0.05, so it can be concluded that parity has a significant relationship with gestational hypertension, where the higher the parity, the more likely it is to be at risk of gestational hypertension. OR = 2.820 is in the interval 1.428-5.569. The results of this study are in line with Arifandini's research (2017) The Relationship between Parity in Pregnancy and the Incidence of Preeclampsia in Pregnant Women in the Working Area of the Rumbia Public Health Center, Lampung Tengah Regency, that the results of the univariate test showed that 62 pregnant women with preeclampsia, the proportion of pregnant women with severe preeclampsia was 56 .5% (35 pregnant women), the parity of pregnant women at risk is 62.9% (39 pregnant women). The statistical test results of the *chi-square* test showed that there was a relationship between the parity of pregnant women and preeclampsia p-value = 0.008 and OR = 4.21, while the results of the multivariate analysis showed that parity at risk was more dominant in influencing the incidence of preeclampsia in pregnant women p value 0.010 and OR 4, 21.

Gestational age, p value = 0.013 <0.05, so it can be concluded that gestational age is associated with gestational hypertension, where the higher the gestational age, the more likely to be at risk of gestational hypertension. OR = 2.344 which is in the interval 1.242-4.425. It is in line with the research of Kusumawati and Mirawati (2019). The relationship between the age of mothers giving birth and the incidence of preeclampsia (at Aura Syifa Hospital, Kediri Regency) where the results showed that 291 mothers who gave birth, the majority who suffered from preeclampsia were aged 20-35 years (4.5%) and the minority were table age, so H1 was accepted. This means that there is a relationship between maternal age and the incidence of preeclampsia

Economy, p value = 0.008 <0.05, so it can be concluded that economic factor is significantly related to gestational hypertension, where the less supportive economic factors, the more likely respondents are to be at risk of gestational hypertension. OR = 3.014 which is in the interval 1.318-4.750. It is supported by Dasuki's research (2021) on Analysis of Factors Influencing Early Detection in the Prevention of Preeclampsia. The results of this statistical test found that 32 pregnant women experienced early detection in preventing preeclampsia (88.1%). Based on the Spearman Rank Correlation statistical test, the results obtained were P.Value: 0.000 <a: 0.05 with a correlation value of 0.600 so that H-0 was rejected. It states that there is a close relationship with economic status factors, family support and socio-culture which affect early detection in the prevention of preeclampsia at Public Health Center of Arosbaya, Bangkalan Regency

Personal history of hypertension before pregnancyp value = 0.007 <0.05, so it can be concluded that a personal history of experiencing hypertension before pregnancy is associated with hypertension of pregnancy, experiencing hypertension before pregnancy tends to be at risk of hypertension of pregnancy, OR value = 3.014 which is in the interval 1.333-4.901. .The results of this study are also in line with Mariza's research, (2018) on Relationship between history of hypertension and the incidence of severe preeclampsia in women giving birth at Dr. H. Abdul Moeloek Hospital of Lampung Province revealed that the results of statistical tests using the *Chi-square* test obtained p-value = 0.000 (p-value < α = 0.05), with OR: 9.817 (3.683 – 26.168) 95% CI, it can be concluded that statistically there is a significant relationship between history of hypertension and the incidence of severe pre-eclampsia at Dr. H. Abdul Moeloek Hospital in Bandar Lampung. Based on the opinion of the researchers,

respondents who had a history of hypertension were more anticipatory of their own health by emphasizing pregnancy checks, so that respondents avoided the risk of severe preeclampsia.

Family history of hypertension, p value = 0.0002 <0.05, so it can be concluded that family history of hypertension is significantly related to gestational hypertension, where the more family history of hypertension, the more likely to be at risk of gestational hypertension. OR value = 2,857 which is in the interval 1,502 - 5,434. The results of this study are in line with Ovie's study (2017) on the relationship between family history of hypertension and the incidence of preeclampsia, where the number of samples reached 62 subjects and the results of bivariate analysis obtained 61.3% of the case group had a family history of hypertension. There was a significant relationship between a family history of hypertension and the incidence of preeclampsia with a value of p = 0.001 (<0.1) OR = 6.597.

Obesity, p value = 0.001 <0.05, so it can be concluded that obesity has a significant relationship with gestational hypertension, where the more obesity there is, the more likely it is to be at risk of gestational hypertension. OR = 3.263 which is in the interval 1.510-7.054. The results of this study are in line with Fisabililla's research (2021) The Relationship Between Obesity and the Incidence of Hypertension in Pregnant Women in the Working Area of the Ranuyoso Health Center, Lumajang Regency, which stated similar results. The results of a simple linear regression statistical test showed that there was a relationship between obesity and eating patterns with the incidence of hypertension in pregnant mother.

Activity and exercise, p value = 0.007 <0.05, so it can be concluded that activity and exercise are significantly related to gestational hypertension. The less activity and exercise tends to be at risk of pregnancy hypertension OR value = 2,533 which is in the interval 1,336-4,803. The results of this study are in line with Nurhidayati's research (2018) "Relationship between Morning Walks and Pre-Eclampsia in Pregnant Women in the Public Health Center of Moncek Tengah, Lenteng Sub-Regency, Sumenep Regency", which stated results that has the same opinion, where the results of the study showed that most pregnant women in the Public Health Center of Moncek, Lenteng Sub-Regency, Sumenep Regency did morning walking 84.6% of people who did not suffer from pre-eclampsia (69.2%). While the relationship between the two variables in the *chi-square test* was obtained sig = 0.000, in the Spearman's test the correlation coefficient was obtained = -0.479, It means that the degree of relationship between the two variables is strong, and it has a negative correlation coefficient.

CONCLUSION

Based on research findings and data analysis on risk factors for gestational hypertension in Regency of Deli Serdang, it can be concluded according to the study objectives, namely: Components of risk factors for pregnancy hypertension are such as age, education, occupation, parity, gestational age, economic factors, personal and family history of hypertension, obesity and exercise. Based on the results of Multivariate analysis then it can be synthesized that the risk factors for pregnancy hypertension are influenced by factors: education (p=0.045), parity (p=0.047), gestational age (0p=0.040), personal history of hypertension (p=0.013), family history (p=0.049), and obesity (p =0.016). While the factors of age, occupation, economy and exercise have no effect on risk factors for hypertension in pregnancy. Based on Exp (B) value, the most influential factor was personal history of hypertension (p=0.013). It is indicated by the value Exp (B) = 2.710 which is in the interval 1.234 – 5.953, followed by obesity (p=0.016) with the value Exp (2.612) which is in the interval 1.192 – 5.725.

ANNOUNCEMENT

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