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Determinants of Hypertension in Pregnancy (HDK) Disorders

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Abstract. *Background: Hypertensive Disease in Pregnancy (HDK) is a vascular disorder that occurs during pregnancy, arises during pregnancy or in the postpartum periode, and is one of the most common causes of maternal death. Objective: this study was to determine how factors of having a history of hypertension, obesity, and using hormonal birth control impact the incidence of hypertension Disease in pregnancy (HDK). Metodes: the research approach used was analytic observation with a* croos sectional *design. This study involved 332 pregnant women who come to the Health Center. A sampel random sampling technique, with a sample size of 183 was used. In this study, the independent variables were history of hypertension, obesity, and hormonal birth control use; the incidence of HDK was the dependent variable. Data was collected using a documention study approach with an observation sheets. To analyse the data, a logistic regression statistical test was used with an error rate of α 0.05. The results showed that pregnant women with HDK were exposed to hypertension 45.6%, and hormonal birth control by 36.3%. The result of bivariate analysis of hypertension history with HDK is o.o1 < α 0.05, and the variable of obesity with HDK is 0.024 < α 0.05 and the variable of hormonal birth control history with HDK is 0.21% < α 0.05. The conclusion of the results showed that of the three factors contributing to the incidence of HDK, only the history of hypertension and obesity had a significant influence, with a history of hypertension accounting for 9.9% of HDK cases. Therefore, it is recommended that Strengthing Integrated Antenatal care for increasing the role of mindwives and general practitioners in better screening of pregnant women at risk.*

Keywords: *Hypertensive Disease in Pregnancy , History, of hypertenstion, Obesity*

1. INTRODUCTION

Hypertensive disease in pregnancy (HDK) is a vascular disorder that occurs during pregnancy or during the postpartum period. Hypertension of pregnancy is a common condition and is one of the leading causes of maternal mortality. Hypertension can lead to stillbirth and perinatal death caused by premature partus 6.

Approximately 10% of pregnant women worldwide suffer from hypertension of pregnancy (HDK). Preeclampsia, eclampsia, gestational hypertension, and chronic hypertension are among the diseases in this condition. Hypertension of pregnancy is a major factor causing significant acute morbidity, long-term disability, and maternal and infant mortality. Almost a tenth of all maternal deaths in Asia and Africa are due to hypertension in pregnancy, while a quarter of all maternal deaths in Latin America are due to complications. Providing adequate time and care to women, especially those with complications of hypertension, can prevent most of the deaths associated with this condition 8.

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The maternal mortality rate (MMR) during childbirth in Indonesia is the third highest in South and Southeast Asia, with a MMR of 359 per 100,000 live pregnancies and an infant mortality rate (IMR) of 32 per 100,000 live pregnancies. In 2020, the maternal mortality rate (MMR) in West Java province was 96 per 100,000 live pregnancies2. West Java province had a maternal mortality rate (MMR) of 96 per 100,000 live pregnancies in 2020 (3). Then, in 2023, the maternal mortality rate increased to 792 or 96.89 per 100,000 live pregnancies, an increase of 114 or 678 from 2022. With a significant jump of 1,206 cases in 2021 compared to the previous year, West Jawab Province ranked the second highest MMR in Indonesia. Among the 27 districts/cities in West Java Province, there was a significant variation of 122.2678 cases of maternal mortality, with an average of 17.04 cases (Arifa & Rifai, 2023).

Haemorrhage, infection, prolonged partus and abortion are the top five causes of maternal death. The three leading causes of maternal death in Indonesia remain predominantly haemorrhage, chronic liver disease (CHD) and infection. The proportions of the three causes of death have changed, with haemorrhage and infection tending to decrease while the proportion of HDK has increased. This study is very important to determine the causative factors of gestational hypertension (GHD) in Indonesia because the maternal mortality rate and hypertension in pregnancy in Indonesia are still high. It is hoped that this study will increase the awareness of pregnant women about blood pressure control during pregnancy.

2. METHODS

This study was conducted through an analytical observational approach and used a cross-sectional design. In this study there were 332 pregnant women who came to the Puskesmas. Simple random sampling method, with a sample size of 183 was used. In this study, history of hypertension, obesity, and use of hormonal birth control were independent variables. The incidence of HDK was the dependent variable in this study. Data collection using documentation study method and observation sheet for data analysis, logistic regression statistical test was used, with an error rate of α 0.05 was set.

3. RESULT

Data from History of Hypertension, Obesity, Hormone Birth Control Use, Hypertension in Pregnancy.

Below, presents data on the frequency distribution of the results of research on variables of history of hypertension, obesity, use of hormonal birth control, and hypertension in pregnancy, table 1:

Table 1Frequency distribution data of history of hypertension, obesity, hormonal birth control use, pregnancy hypertension.

Variable	Frequency (f)	percentage (%)
History of Hypertension		
Available	20	11
Never	162	89
Total	**182**	**100**
History of Obesity		
Available	83	45.6
Never	99	54.6
Total	**182**	**100**
History of hormonal birth control		
Available	69	37.9
Never	113	62.1
Total	**182**	**100**
Hypertension in Pregnancy		
Available	66	36.3
Never	116	63.7
Total	182	100

According to table 1 out of 182 pregnant women surveyed, 36.3% had HDK. The results also showed that pregnant women with hypertension 11%, obesity 45.6% of hormonal birth control history 37.9%.

Contingency Table Data of Variables Combining History of Hypertension, Obesity, and Hormone Birth Control Use with Hypertension Variable in Pregnancy. The following are the results of studies related to the history of hypertension, obesity, hormone birth control use, and hypertension variables in pregnancy, table 2:

Table 2
Contingency Table Data of Variables Combining History of Hypertension, Obesity, and Use of Hormonal Birth Control with Hypertension Variable in Pregnancy.

Variabel	HDK		Total
	Available	Never	
History of Hypertension			
Available	14 (70%)	6 (30%)	20 (100%)
Never	52 (32.1%)	110 (67.9%)	162 (100%)
Total	**66 (36.3%)**	**116 (63.7%)**	**182 (100%)**
History of Obesity			
Available	37 (44.6%)	46 (55.4%)	83 (100%)
Never	29 (29.3%)	70 (70.7%)	99 (100%)
Total	**66 (36.3%)**	**116 (63.7%)**	**182 (100%)**
History of hormonal birth control			
Available	28 (40.6%)	41 (59.4%)	79 (100%)
Never	38 (33.6%)	75 (66.4%)	113 (100%)
Total	**66 (33.3%)**	**116 (63.7%)**	**182 (100%)**

Table 2 shows that pregnant women with HDK 36.3% were higher in the hypertension (70%), obesity (36.3%), and hormonal birth control (33.3%) groups. Another group showed that pregnant women with HDK 33.3% were higher in the hormone birth control group (40.6%).

Relationship between History of Hypertension and Hypertension in Pregnancy

Table 3
Relationship between History of Hypertension and Hypertension in Pregnancy

Variable	HDK		Jumlah	P
	Available	Never		
History of Hypertension				0.01
Available	14 (70%)	6 (30%)	20 (100%)	
Never	52 (32.1%)	110 (67.9%)	162 (100%)	
Total	**66 (36.3%)**	**116 (63.7%)**	**182 (100%)**	

In Table 3, the results show that pregnant women with a history of hypertension and no history of hypertension have a different risk of developing HDK of 0.379, the ratio of developing HDK or Relative Risk (RR) is 2.18, and the ratio of developing HDK compared to not HDK between pregnant women with a history of hypertension and no history of hypertension (OR) is 4.93.

4. DISCUSSION

Relationship Between History of Hypertension and Hypertension in Pregnancy

In a study conducted by Andriyani, A et al, a history of hypertension before pregnancy affects the likelihood of hypertension in pregnancy. In addition, the study found that obesity, diabetes mellitus, chronic hypertension, use of contraceptives, fruit and vegetable consumption, and excessive consumption of salty foods are all factors that have the potential to affect the likelihood of hypertension in pregnancy. In addition to obesity, there is a significant correlation between pregnancy hypertension and history of chronic hypertension. Pregnant women without chronic hypertension have a 16.67% lower prevalence 10.

Research on factors associated with hypertension in pregnant women (Tavares, A. M. B et al 2023). This study states that hypertension in pregnancy can be considered partly important by the media and is a major cause of maternal and infant morbidity and mortality. Therefore, health professionals should pay special attention to this issue 5.

If a person has a history of chronic hypertension during pregnancy, they have a greater risk of developing hypertension in pregnancy, which can lead to greater preeclampsia and chronic hypertension 8. When compared to other maternal deaths, such as pepsis, haemorrhage, and abortion hypertension is responsible for 16% of maternal deaths in Indonesia 5. According

to data from Pusdatin (Centre for Data and Information, Ministry of Health), hypertension is the most common cause of maternal deaths in Indonesia.

Relationship between hormonal birth control history and hypertension in pregnancy The results of this study are different from the research of Wang, W et al. This study explains the results of the calculation of the Prevalence Ratio (RP>1), which shows that hormonal contraceptives injections and pills are responsible for 2.93 and 3.61 times more than IUD (nonhormonal) contraceptives. This suggests that hormonal birth control containing oestrogen and progesterone increases blood pressure but remains within the normal blood pressure range (<140 mmHg).

Setivoyani said that another opinion on contraceptiveshormonal, such as birth control, is that it is basically a drug that consists of more than strogen. She also said that hormonal contraceptives, such as birth control pills, birth control injections, and birth control coils, can have an impact on increasing blood pressure. Rossana states that the combination of these contraceptive drugs can affect metabolism. Blood pressure regulation is one of the metabolisms affected by these three types of hormonal contraceptives 11.

All three types of hormonal contraceptives can affect blood pressure, according to this opinion. For this reason, it is important for hormonal women to have their blood pressure checked regularly, either at the clinic or at home using an appropriate tensimeter. The use of hormonal contraception is not necessarily detrimental, despite its effects on blood pressure. Hormonal contraception has been proven safe and approved globally.

The relationship between history of hypertension, history of obesity and history of hormonal birth control use with hypertension in pregnancy.

This is in accordance with the findings of research conducted by Andiyani, A et al, which states that the interaction analysis of overweight, chronic hypertension, low education level, maternal age below 20 years and above 35 years, and nulliparity on the incidence of hypertensive disorders in pregnancy shows that pregnant women who experience five risk factors at once, namely obesity, chronic hypertension, low education level, maternal age below 20 years and above 35 years, will have a high risk. 10.

Another study that supports the findings of this study is that a history of chronic hypertension before pregnancy can increase the risk of hypertension in pregnancy, which can lead to preeclampsia and chronic hypertension on top of it 8. According to Manuaba, I. I, essential hypertension or secondary hypertension that occurs before pregnancy can be a sign of chronic hypertension. Gestational hypertension may indicate that a person will suffer from chronic hypertension in the future. During pregnancy, between 20-25% of people with chronic

hypertension will experience preeclampsia. In addition, one third of people with gestational hypertension will develop preeclampsia later in life. Renal parenchymal diseases (such as polycystic kidney), renal vascular diseases (such as renal artery stenosis, fibromuscular dysplasia), endocrine disorders.

In a case study at a health centre on the determinants of hypertension in pregnancy, which included a history of hypertension, obesity, and the use of hormonal birth control, it was found that factors with a history of hypertension can affect the risk or influence the incidence of hypertension in pregnancy. Mothers who have a history of obesity can also affect the risk or influence the incidence of HDK during pregnancy. The factor that the mother snores may also affect the risk or influence the incidence. The results showed that the history of obesity was excluded from the model because there was no interaction between obesity two independent variables and the dependent variable.

Research findings by Norlita and Safitri (2019), state that there is an effect of obesity on the incidence of hypertension in pregnancy, so this can be started when women of childbearing age or during adolescence in controlling weight, so as to prevent the risk of pregnancy. So, in preventing pregnancy hypertension, as health workers can help socialise the prevention of pre-eclampsia to cadres, according to a book written by Pratiwi L et al (2024), so that pregnant women at risk get comprehensive support and services. We as health workers together with the community must support the knowledge and pregnant women as well, the knowledge of pregnant women starts during adolescence or when they start planning to become pregnant, (L Pratiwi, 2021).

5. CONSLUSION AND LIMITATION

Conslusion

The results showed that of the three factors contributing to the incidence of HDK (*Hypertensive Disease in Pregnancy)*, only the history of hypertension and obesity had a significant influence, with a history of hypertension accounting for 9.9% of HDK cases.

Limitation

This study is only limited to the area of first-level health facilities in a random area, does not focus on one first-level health facility, has not reached the area of hospitals and problems in rural areas and there are many other variables that can be studied.

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