International Journal of Nursing and Midwifery Science (IJNMS)

http://ijnms.net/index.php/ijnms
ORIGINAL RESEARCH

e- ISSN: 2686-2123
p- ISSN: 2686-0538

ANALYSIS OF THE CAUSES OF HYPERTENSION IN PREGNANCY (IN THE PONEK ROOM OF DR WAHIDIN SUDIRO HUSODO REGIONAL HOSPITAL, MOJOKERTO CITY)

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ABSTRACT

The maternal mortality rate (MMR) in Indonesia is still relatively high, reaching 183 per 100,000 live births based on the national target of the 2024 National Medium-Term Development Plan (RPJMN). With 4,150 cases, this figure shows a significant gap from the target set in the 2024 RPJMN. The three main causes of maternal death in Indonesia are gestational hypertension (GHD), hemorrhage, and infection. These three causes are largely preventable with appropriate and prompt medical intervention. Despite improvements in the quality of prenatal care, the incidence of gestational hypertension continues to rise. The exact cause of gestational hypertension remains unknown, and the disease is thought to be multifactorial. Currently, there is no definitive way to prevent gestational hypertension . Research Objective: This study was conducted to evaluate the factors causing hypertension in pregnancy and to provide appropriate preventive solutions. The research method used was descriptive research with an observational approach to examine the characteristics of patients with hypertension in pregnancy at Dr. Wahidin Sudiro Husodo Regional General Hospital, Mojokerto City, in 2024-2025. Based on the results of the research that has been carried out, the analysis results obtained by the Maternal Age variable have a p-value of 0.877 (> 0.05), so it can be concluded that there is no relationship between Maternal Age and the occurrence of Hypertension in Pregnancy, the Parity variable has a p-value of 0.995 (> 0.05), so it can be concluded that there is no relationship between Parity and the occurrence of Hypertension in Pregnancy, the Gestational Age variable has a p-value of 0.998 (> 0.05), so it can be concluded that there is no relationship between Gestational Age and the occurrence of Hypertension in Pregnancy, the Obesity variable has a p-value of 0.998 (> 0.05), so it can be concluded that there is no relationship between Obesity and the occurrence of Hypertension in Pregnancy, the Gestational DM variable has a p-value of 0.988 (> 0.05), so it can be concluded that there is no relationship between Gestational DM and the occurrence of Hypertension in Pregnancy.

Keywords

Factors, Causes, Hypertension, Pregnancy

INTRODUCTION

WHO data shows that hypertension in pregnancy is one of the leading causes of maternal death. WHO reports that approximately 80% of maternal deaths, classified as directly related to pregnancy, are caused by five causes: postpartum hemorrhage (25%), preeclampsia and eclampsia (20%), abortion (13%), and other causes (7%). It is known that the number of maternal deaths worldwide in 2013 reached nearly 210,000 cases, of which maternal deaths due to hypertension reached 14,000 cases. This figure indicates a significant burden caused by hypertension in pregnancy, especially in countries with limited health systems. The global prevalence of hypertension in pregnancy is estimated at around 10-15%, while preeclampsia affects 2-8% of all pregnancies. The prevalence of hypertension in pregnancy in developed countries varies, only around 2.3-3% between 2015 and 2020. The incidence of hypertension in pregnant women is lower due to early detection efforts and better access to health care facilities. In the United States, the incidence of hypertension in pregnancy increased from 13% in 2017 to 16% in 2019, with the incidence of preeclampsia around 3% of all pregnancies (Budayasa, 2025)

Hypertension in Pregnancy (HDK) itself is hypertension found in pregnant women with systolic blood pressure ≥140 mmHg and diastolic ≥90 mmHg (Alatas, 2019). In general, there are causes of Hypertension in Pregnancy (HDK), namely maternal age, number of parities, previous history of preeclampsia, twin pregnancies, history of preeclampsia in the family ((Djanah, 2010). Hypertension in pregnancy is 5-15% of pregnancy complications and is quite high. This is caused not only by unclear etiology, but also by care during childbirth which is still handled by non-medical personnel and an imperfect referral system. Hypertension in pregnancy can be experienced by all levels of pregnant women so that knowledge about managing hypertension in pregnancy must be truly understood by all medical personnel both at the center and in the regions.

According to data from the World Health Organization (WHO), an estimated 295,000 women and adolescent girls died from complications related to pregnancy and childbirth in 2020. Hypertensive disorders in pregnancy are a major cause of morbidity, long-term disability, and even death for mothers and their babies. Worldwide, gestational hypertension accounts for approximately 14% of all maternal deaths. The Maternal Mortality Rate (MMR) in ASEAN is 235 per 100,000 live births (ASEAN Secretariat, 2020). In Indonesia, the prevalence of hypertension in pregnancy is quite high. Several studies indicate the incidence of hypertension in pregnancy ranges from 5-15% of all pregnancies. Data from the 2018 Basic Health Research (Riskesdas) shows the prevalence of hypertension in the adult population at 34.1%, and this also impacts pregnant women. The Maternal Mortality Rate (MMR) in East Java in 2023 experienced a slight increase compared to the previous year. In 2020, the maternal mortality rate in East Java was 98.40 per 100,000 live births. In 2021, it was 234.7 per 100,000 live births. In 2022, it decreased to 93.00 per 100,000 live births. In 2023, it experienced a slight increase to 93.73 per 100,000 live births. The most common cause of maternal mortality in East Java, based on the ICD-10 code for MM, is Group 2: Hypertension in pregnancy, childbirth, and the postpartum period (Dinkes Jatim, 2024)

METHOD

The research method used was descriptive research with an observational approach to observe the characteristics of patients with hypertension in pregnancy. The population in this study were all pregnant women who gave birth with HDK in the PONEK Room of Dr. Wahidin Sudiro

Husodo Hospital, Mojokerto City, from October 2024 to October 2025, totaling 74 respondents. The data collected were secondary data (medical records).

RESULTS

Table 1. Respondent Characteristics

Characteristics	f	%
Maternal age		
< 20 years	2	2,7 %
20 – 35 years	49	67,1 %
> 35 years	23	31,5 %
Paritas		
Primi	32	43,8 %
Multipara	30	40,5 %
Grande	12	16,2 %
gestasional age		
Preterm	28	37,8 %
Aterm	46	62,2%
History of hypertansion	55	74,3 %
There is	19	25,7 %
There isn't		
DM Gestasional		
There is	63	85%
There isn't	11	15 %
Obesity		
There is	50	67,5
There isn't	24	32,5

Based on the results of descriptive analysis of 74 respondents, it was found that the average maternal age was 31.46 years with a range of 16–44 years, indicating that most were at a safe reproductive age, but there were still mothers at a high-risk age. The average parity of 2.19 indicated that the majority of respondents were multiparous, although there were several grandemultiparous who potentially increased the risk of complications. The incidence of Hypertension in Pregnancy (HDK) in this study was very high, namely 98.6%, indicating that most respondents were in the high-risk group. Gestational age was dominated by the term category (61.6%), while another 38.4% gave birth at preterm gestational age.

which may be associated with hypertension. Clinical factors revealed that 32.4% of mothers were obese and 14.9% had gestational diabetes mellitus, both important

Tabel 2 Variables in the Equation

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1a	Usia_Ibu	-.053	.346	.024	1	.877	.948
	Paritas	16.282	2803.070	.000	1	.995	11780765.841
	Usia_Kehamilan	-17.495	6071.638	.000	1	.998	.000
	Obesitas	16.638	6200.667	.000	1	.998	16816945.843
	DM_Gestasional	16.311	8601.702	.000	1	.998	12127427.406
	Constant	22.334	12462.600	.000	1	.999	5005804335.573

risk factors that potentially contribute to HDK. Overall, the characteristics of the respondents indicate a population with a relatively high medical risk and are relevant for further analysis of the incidence of hypertension in pregnancy

DISCUSSION

1.The Relationship Between Maternal Age and the Occurrence of Hypertension During Pregnancy

The results showed that the majority of HDK patients at DR Wahidin Sudiro Husodo Regional General Hospital, Mojokerto City in 2024-2025 were pregnant women aged 20-35 years, namely 49 pregnant women (67.1%) of the total of 74 pregnant women with Hypertension in Pregnancy at this hospital, and the rest were

divided into two categories, namely 35 years old (31.5%) and <20 years old (2.7%).The maternal age variable has a p-value of 0.877 (>0.05), indicating that each one-unit increase in maternal age increases the risk of gestational hypertension by 0.949 times, although this is not statistically significant.

Pregnant women aged <20 years are more likely to experience high blood pressure and more likely to develop seizures. Age >35 years is also a predisposing factor for gestational hypertension due to increasing age. Pregnant women aged 35 years can experience gestational hypertension due to the suboptimal development of reproductive organs and changes such as increased blood volume and hormonal changes in pregnant women, which can cause hypertension. This can also lead to insufficient emotional and psychological maturity, which increases the risk of pregnancy complications in the form of preeclampsia-eclampsia, which is caused by endothelial cell disorders. Women aged 35 years are at risk for complications during pregnancy and childbirth, which can lead to latent hypertension. (Siahaan, D, 2023)

Table 1 shows that 67.1% of pregnant women with hypertension, even among those of non-risk age, experienced hypertension. While the 20-35 age group is considered reproductive age, in this study, the majority of women of reproductive age experienced hypertension. This is possible because, in addition to age, pregnant women of reproductive age (25-35 years) also have other characteristics that predispose them to hypertension, such as being overweight (Dalimarta, 2008). This finding aligns with research by Ningtias (2021) that found 82.4% of women of reproductive age, 20-35 years, experienced hypertension. Age is a crucial factor in reproductive status

2. The Relationship Between Parity and the Occurrence of Hypertension in Pregnancy

Results showed that the majority of patients with hypertension in pregnancy at Dr. Wahidin Sudiro Husodo Regional General Hospital, Mojokerto City, in 2024-2025 were primiparous (43.3%), multigravida (40.5%), and grandemultipara (16.2%). The parity variable had a p-value of 0.995 (>0.05), indicating that each one-unit increase in parity increased the risk of hypertension in pregnancy by 1,178,0765.841 times compared to pregnant women with low-risk parity, although this was not statistically significant.

Based on the parity characteristics of the study respondents, Table 1 shows that the majority of respondents were primiparous (43.3%), which is considered a high-risk parity. This is inconsistent with research (Putro Raseki Usalma, 2023), which found that pregnant women with high-risk parities were primiparous (20 respondents (28.6%), nulliparous (16 respondents (22.9%), and grand multiparous (5 respondents (7.1%), compared to 29 respondents with low-risk parities (41.4%). Based on the results of Table 4, using a Chi-square statistical test, the p-value was 0.003, which is <0.05. This indicates that H1 is accepted and H0 is rejected, indicating a significant relationship between parity and hypertension in pregnancy.

Based on the distribution of the data, it appears that both primigravida and multigravida women experience hypertension in pregnancy. It can be concluded that the occurrence of hypertension in pregnancy is not due to gravida but is possible due to other factors, namely the nutritional status of the pregnant woman. If the nutritional status is excessive or insufficient, it will cause hypertension in pregnancy.

3. Relationship between Gestational Age and the Occurrence of Hypertension in Pregnancy

Table 1 shows that 62.2% of pregnancies were at term. The results of the study showed a p-value of 0.000 <0.05, indicating a relationship between gestational age and the incidence of hypertension in pregnancy. This finding is inconsistent with the study (Ningtias & Wijayanti, 2021), which found a p-value of 0.861, which is greater than 0.05, indicating no relationship between gestational age and the incidence of hypertension in pregnancy.

Gestation is a direct factor triggering Gestational Hypertension (GHD), a condition characterized by high blood pressure that appears after the 20th week of pregnancy (2nd & 3rd trimester). It often occurs during this period, but can also appear earlier in certain cases. Based on the researcher's assumption from the results above, there is a difference in the results of the relationship between gestational age in the researcher and previous research which states that gestational age in the late 3rd trimester (term) is riskier than gestational age in the 2nd trimester.

4.The Relationship between Gestational Diabetes Mellitus and Hypertension in Pregnancy

Table 2 shows that the variable "Gestational Diabetes Mellitus" has a p-value of 0.988 (>0.05), and Exp(B) = 12127427.406, indicating that each one-unit increase in gestational diabetes mellitus increases the risk of hypertension in pregnancy by 12127427.406 times, although this is not statistically significant.

This may be because the number of mothers giving birth with diabetes mellitus is relatively small, representing 12 out of 194 respondents, compared to mothers without diabetes mellitus. The multivariate analysis of this study showed that diabetes mellitus was the third dominant factor associated with hypertension in pregnancy in mothers giving birth, with an OR of 5.301. This means that mothers giving birth with diabetes mellitus have a 5.30-fold increased risk of developing hypertension in pregnancy. This study is in line with the study of Nuning Saraswati and Mardiana (2016) which showed that there was no significant relationship between a history of diabetes mellitus and the incidence of hypertension in pregnancy in pregnant women (p-value = 0.235). Another study 58 similar from Nursal et al (2015) which showed that there was no significant relationship between a history of diabetes mellitus and the incidence of preeclampsia and was not a risk factor for preeclampsia in pregnant women with a p-value of 1.000. 9,12 This study is not in accordance with the theory which shows that hypertension in pregnancy tends to occur in 50% of pregnant women developing into preeclampsia occurs in women who suffer from diabetes mellitus because diabetes is a disease that can be a trigger for hypertension in pregnancy. This occurs because during pregnancy, the placenta plays a role in meeting all the needs of the fetus. Hypertension in pregnancy occurs in women with diabetes mellitus due to increased production of deoxycorticosterone (DOC), which is produced from progesterone in the blood plasma, and increases sharply during the third trimester.

5. The Relationship Between Obesity and Hypertension in Pregnancy

Table 1 shows that the incidence of non-obese individuals is 62.5%, with the Obesity variable having a p-value of 0.998 (>0.05), with Exp(B) = 16816945.406. This indicates that each one-unit increase in obesity increases the risk of hypertension in pregnancy by 16816945.406 times, although this is not statistically significant.

The obesity characteristics of the study respondents in Table 1 show that the majority of respondents were non-obese (67.5%). Obesity is closely related to an unbalanced diet. Being overweight increases the risk of cardiovascular disease. Therefore,

overweight individuals are more likely to develop hypertension than those of normal weight . Obesity is closely related to various disease complications, especially if experienced by pregnant women, which will have a negative impact on both the mother and the fetus. This study shows that obesity has a significant relationship with the incidence of preeclampsia. Mothers giving birth with obesity have a 5.97 times chance of experiencing preeclampsia compared to mothers giving birth without obesity (p-value 0.0001 OR 5.970 95% CI 2.834-12.577). Multivariate analysis shows that obesity is the second dominant factor associated with the incidence of preeclampsia in mothers giving birth OR 7.352. The results of this study are in line with the study of Fahira Nur (2017) which shows that obesity is a risk factor for the incidence of preeclampsia, obesity has a 5.632 times greater risk of experiencing preeclampsia than mothers who are not obese. According to English et al (2015) pregnant women with obesity will be at risk of experiencing preeclampsia (RR 2.47 95% CI 1.66-3.67). Another study by Reyes et al (2012) showed that mothers with obesity will be at risk of experiencing preeclampsia by 2.90 times compared to mothers who are not obese

CONCLUSIONS

There is no relationship between maternal age, parity, gestational age, gestational diabetes, obesity and the occurrence of hypertension in pregnancy

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