

Maternal age, parity, and gestational age of pregnancy of hypertensive pregnancy disorders

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Abstract

Purpose: This study aims to determine the factors of maternal age, parity, and gestational age contributing to hypertensive pregnancy disorders in Deli Serdang District Hospital. **Methods:** This type of research is observational analytic with a cross-sectional approach to look at maternal age, parity, and gestational age factors for the occurrence of hypertensive pregnancy disorders in Deli Serdang District Hospital in 2018. The sample was 72 people. Data were analyzed by frequency distribution and Chi-Square test with $p \leq 0.05$. **Results:** Most cases of hypertensive disorders in pregnancy fall within the severe preeclampsia category, with the majority occurring among mothers aged 20-35 years and with a parity range of 2-42. Over three-quarters of these cases manifest during the third trimester. There is a significant correlation between maternal age, parity, and the incidence of preeclampsia. **Conclusion:** Maternal age and parity have a significant relationship with hypertensive pregnancy disorders. Health workers should always screen for severe preeclampsia even though pregnant women are not at risk.

Keywords: gestational age; hypertension in pregnancy; maternal age; parity

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INTRODUCTION

Maternal mortality is a global health problem and an indicator of community welfare [1]. This indicator is very sensitive to the existence of health services, both in terms of accessibility and service quality, and can assess the degree of public health, including maternal health programs [2].

The maternal mortality rate in the world is estimated at 216/100,000 Live Births (KH), in developed countries 12/100,000 KH, and in developing countries at 239/100,000 KH [3]. Developing countries account for 99% of global maternal deaths. The maternal mortality

rate in developing countries is 14 times higher than in developed countries. Of the causes of maternal deaths in the world, around 73% are caused by classic triage caused by bleeding, hypertension, sepsis, abortion, and others, and 27% are caused by indirect causes [4]. In Indonesia, during 2010-2013, the causes of MMR remained the same, namely bleeding, hypertension, and infection. When seen from the disease pattern, there is a tendency to decrease bleeding cases from 35.1% to 30.3%, and there is an increase in hypertension cases, initially from 21.5% to 27.1% [5].

Maternal Mortality in North Sumatra Province tends to decrease, with the number of maternal deaths

in 2016 to 2018, respectively 239,205,194 people. North Sumatra Province is still the province with the largest MMR in Indonesia. The highest number of maternal deaths came from Deli Serdang Regency. The cause of death in Deli Serdang Regency from 2017 to 2018 was a decrease in the causes of death caused by cases of bleeding, infection, and other cases. Still, it tends to increase in cases of preeclampsia and eclampsia, namely 6.6% in 2017 to 26.6% in the year 2018.

Preeclampsia is a unique symptom of pregnancy that is characterized by hypertension and proteinuria that occur after 20 weeks of pregnancy in mothers who, before pregnancy, have normal blood pressure and no protein in the urine [6]. Preeclampsia in Indonesia is 128,273/year or around 5.3%. The results of study 12 state that this case occurred in approximately 5% of cases. The high incidence of preeclampsia contributes greatly to a significantly high maternal mortality rate [7].

The Deli Serdang Regional General Hospital is the only General Hospital owned by the Government of Deli Serdang Regency. It is a Service Referral Center with Class B Non-Education status.

Deli Serdang Regional General Hospital has an effective working area in 14 Subdistricts of 22 Subdistricts in Deli Serdang Regency, with a population of around 1.85 million people, so cases of obstetric and gynecological emergencies, especially HPD cases, are often found here. Preliminary studies conducted at Deli Serdang District Hospital from July 2017 to August 2018 found 113 cases (12.5%) of 898 deliveries. Hypertension in pregnancy is hypertension that occurs during pregnancy and usually in the last month of pregnancy or more after 20 weeks of gestational age in women who were previously normotensive, blood pressure reaches a value of 140/90 mmHg or an increase in systolic pressure of 30 mmHg and a diastolic pressure of 15 mmHg above the standard value. Preeclampsia is a part of HPD. Preeclampsia is a complication in pregnancy that is still one of the three leading causes of death and is a life-threatening condition if severe cases of preeclampsia do not get seizure prevention, and this has an impact on the survival of mothers and infants [8].

Until now, the exact cause of preeclampsia is not yet known. Factors that influence can affect preeclampsia include eclampsia, age, parity, and history of hypertension. A history of hypertension is the most risk factor for the incidence of preeclampsia with OR 6.42. There is a relationship between age, parity, and the incidence of preeclampsia with p-value = 0,000 and OR 14,37.4. For that, researchers want to know the age,

parity, and gestational age with the occurrence of factors that cause HPD in Deli Serdang Hospital.

The formulation of the problem centers on whether maternal age, parity, and gestational age are significant factors influencing the occurrence of hypertensive disorders in pregnancy (HPD) at Deli Serdang District Hospital. This research aims to explore the relationships between these variables and HPD, seeking to provide a clearer understanding of how they contribute to its incidence. The findings are expected to enrich existing knowledge regarding the role of maternal age, parity, and gestational age in HPD. Practically, this study serves as a valuable resource for healthcare professionals, offering critical insights that can aid in the early detection of risk factors, thereby contributing to the prevention and management of HPD.

METHODS

This type of research is observational analytic with a cross-sectional approach to see the mother's age, parity, and gestational age of the occurrence of HPD in maternity in Deli Serdang Hospital from July 2018 to August 2019. Data obtained from patient medical records, the study population was all mothers delivered in Deli Serdang District Hospital; the sample in this study were all mothers who experienced HPD in the delivery room of Deli Serdang District Hospital, Deli Serdang Regency, amounting to 72 people. Data analysis was performed by Chi-Square test with $p \leq 0.05$.

RESULTS

Based on Table 1 above, it can be seen that of women with HPD, 56.9% suffer from SEVERE PREECLAMPSIA, 22.2% suffer from gestational hypertension, and 5.6% suffer from eclampsia. 65.3% of mothers who suffer from hypertension in pregnancy are in the age group of 20-35 years, 88.9% with 3rd-trimester pregnancy, and 43.1% of BPS referrals.

In the next stage, the data is carried out in bivariable analysis to determine the relationship of independent variables with dependent variables using the Chi-Square statistical test. The prevalence of respondents who have HPD based on age is 68.1% aged 20-35 years and suffering from severe preeclampsia, amounting to 100% of independent variables with dependent variables using the Chi-Square statistical test. The results of the analysis are presented in table 2.

Table 1. Distribution of hypertension frequency in pregnancy at Deli Serdang District Hospital Deli Serdang Regency (n=72)

| Variable | n (%) |
|---|-----------|
| Hypertensive pregnancy disorders | |
| Gestational hypertension | 16 (22.2) |
| Mild preeclampsia | 11 (15.3) |
| Severe preeclampsia | 41 (56.9) |
| Eclampsia | 4 (5.6) |
| Maternal age (years) | |
| < 20 | 2 (2.8) |
| 20-35 | 47 (65.3) |
| > 35 | 23 (31.9) |
| Parity | |
| 1 | 18 (25.0) |
| 2-4 | 39 (54.2) |
| >5 | 15 (20.8) |
| Gestational age | |
| Trimester 1 | 1 (1.4) |
| Trimester 2 | 7 (9.7) |
| Trimester 3 | 64 (88.9) |

The prevalence of respondents who have HPD based on age is 68.1% aged 20-35 years and suffering from severe preeclampsia, amounting to 100% of mothers who experience exclamation are mothers aged less than 20 years. Statistical test results obtained p value = 0.01, indicating a significant relationship between maternal age and the incidence of HPD.

The prevalence of respondents with HPD, based on a parity of 66.7%, was severe preeclampsia in parities 1 to 3, while an eclampsia of 13.2% occurred in parity 1. The statistical test results obtained p = 0.04, indicating a significant relationship between maternal parity and HPD incidents.

The prevalence of HPD cases is based on gestational age: 60.0% of mothers suffering from severe preeclampsia have gestational age in trimester 2 and 56.7% in trimester 3. The results of statistical tests obtained a p-value of 0.34. This means there is no relationship between the variable of gestational age and the occurrence of HPD.

Table 2. Results of the analysis of the relationship between the characteristics of respondents and hypertension in pregnancy (n = 72)

| Variable | Hypertensive pregnancy disorders (n, %) | | | | χ^2 | p |
|---|---|-------------------|---------------------|-----------|----------|-------|
| | Gestational hipertensional | Mild preeclampsia | Severe preeclampsia | Eclampsia | | |
| Maternal age (years) | | | | | | |
| Less than 20 | 0 (0) | 0 (0) | 0 (0) | 2 (100) | 43.49 | 0,01* |
| 20-35 | 9 (19.1) | 4 (8.5) | 32 (68.1) | 2 (4.3) | | |
| > 35 | 7 (30.4) | 7 (30.4) | 9 (39.1) | 0 (0) | | |
| Parity | | | | | | |
| Parity 1 th | 2 (11.1) | 1 (5.6) | 12 (66.7) | 3 (16.7) | 13.2 | 0.04 |
| Parity 2 th -3 th | 6 (20.0) | 4 (13.3) | 20 (66.7) | 0 (0) | | |
| Parity \geq 4 th | 8 (33.3) | 6 (25.0) | 9 (37.5) | 1 (4.2) | | |
| Gestational age | | | | | | |
| Trimester 2 | 0 (0) | 1 (20.0) | 3 (60.0) | 1 (20.0) | 3.29 | 0,34 |
| Trimester 3 | 16 (23.9) | 10 (14.9) | 38 (56.7) | 3 (4.5) | | |

χ^2 = Chi-Square; p = p-value

DISCUSSION

Hypertension in pregnancy is a mother diagnosed with gestational hypertension, preeclampsia, eclampsia, chronic hypertension with superimposed preeclampsia, and chronic hypertension [9-11]. But in this study, the HPD variables studied were gestational hypertension (HG), mild preeclampsia, and severe preeclampsia and Eclampsia.

Maternal age

Age significantly affects pregnancy, the age of pregnant women less than 20 years or more than 35 years is closely related to various complications that occur during pregnancy, childbirth, and also

the health of the baby while still in the womb and after birth. The study explained that there is a relationship between maternal age and the incidence of preeclampsia [12]. The results of the analysis show that mothers who are at risk have a 15.1 times chance of experiencing preeclampsia compared to mothers who are not at risk. The older the mother's age, the greater the risk of preeclampsia. The age of the mother is \geq 35 years at 1.9 times the risk of preeclampsia [13]. At the same time, studies in the United States reported that the group of older pregnant women had more preeclampsia compared to the group of younger mothers [10]. The risk of preeclampsia was also found to increase with increasing maternal age [12].

In this study, respondents who suffered 100% eclampsia occurred in pregnant women aged less than

20 years. This is caused by the reproductive function of pregnant women not being ready to accept pregnancy and psychological conditions in immature mothers. After analyzing the 2x3 table, it was found that mothers who suffer from preeclampsia with age less than 20 years are pregnant women with parity 1. This study also found that most cases of severe preeclampsia originated from mothers aged 20-35 years, and the age contribution was more than 35 years in cases of gestational hypertension, mild preeclampsia, and severe preeclampsia, each of which is more than 30%. Age \geq 35 years is an age that is at risk for pregnancy to increase at this age, the condition of maternal health has decreased, the function of reproductive organs has reduced, and the quality of cell cells has decreased. One risk for pregnant women aged di 35 years is HPD [14].

Parity and gestational age

Parity is the number of fetuses born. Parity is a risk factor for HPD. The risk of preeclampsia is based on parity; according to a study, the incidence of preeclampsia is (3.9%) in the first pregnancy, whereas subsequent pregnancies involve the same partner, preeclampsia (1.7%) occur in the second pregnancy and (1.8%) in the pregnancy [15]. In this study, 66.7% of severe preeclampsia occurred in parity 1, with the same number of presentations occurring in parity 2 and 3, 16.7% in an eclastic case happened in the first parity. This is reinforced by the fact that the frequency of preeclampsia is higher in primigravidas than in multigravidas. Still, in this study, the case study percentage of severe preeclampsia cases in multigravida did not differ from primigravida. A statement from a study shows that the frequency is higher in primigravidas than in multigravidas based on the immunologic theory conveyed by Sudhaberata (2005) because in the first pregnancy, the formation of "blocking antibodies" to imperfect antigens occurs. In addition, according to Angsar, D (2004), in the first pregnancy, the formation of "Human Leucocyte Antigen Protein G (HLA)" plays an essential role in modulating the immune response so that the mother rejects the results of conception (placenta) or the mother's intolerance of the placenta occurs so that preeclampsia occurs [16]. This can be proven by the results of this study that parity one and parity more than four cause eclampsia, both of which are high-risk groups for HPD.

According to a study, changes in partners have been thought to increase the risk of preeclampsia, this servation may be confused by the effect of inter-birth

intervals [15]. The apparent increase in the risk of preeclampsia with partner changes has been interpreted as support for the hypothesis that the failure of the immune system to adapt to this pair's antigen causes preeclampsia. This theory was proposed in 1975 in a report on a case of preeclampsia during the second pregnancy of a woman who changed her partner after the birth of the first child; this led to widespread speculation about the mechanism of immunity possibly related to partner changes. The results of the study state that most preeclampsia is in the multigravida group, and there is no relationship between parity and preeclampsia [17]. In this study, it was proven that there was a significant relationship between parity and HPD incidence.

Many theories have tried to explain the causes of the disease, but no one gives a satisfying answer. The reason for this is the increasing frequency of pregnancy [18]. This study showed increased cases in line with the greater gestational age. In Table 1, it can be seen that the number of HPD cases in trimester 3 is 92.7%. This number is more significant compared to the incidence of HPD in trimester 1 gestational age, which is 8.3%. This is consistent with the above theory that in the modulation of the immune response, the mother rejects the results of conception (placenta) or intolerance of the mother to the placenta so that preeclampsia occurs, the greater the gestational age, the greater the body's exposure to pregnancy will increase the reaction of the body of the pregnant woman so that an increase in HPD cases. However, after the analysis, it can be seen that the highest severe preeclampsia cases come from mothers with 2-trimester pregnancies (60.0%), and the presentation decreases in 3-trimester pregnancies (56.7%). The statistical analysis results show no relationship between gestational age and the incidence of HKD.

The cause of preeclampsia is not yet known with certainty, based only on theories that are connected with events. Many other factors are at risk with preeclampsia, such as obesity, genetic factors, husband factors, a history of chronic hypertension and chronic kidney disease, diet, and socio-economic conditions.

CONCLUSION

Based on the data, most cases of hypertensive disorders in pregnancy fall within the severe preeclampsia category, with the majority occurring among mothers aged 20-35 years and with a parity range of 2-42. Over three-quarters of these cases

manifest during the third trimester. There is a significant correlation between maternal age, parity, and the incidence of preeclampsia, although gestational age does not show an important relationship. This underscores the importance of continuous screening for severe preeclampsia by healthcare providers, regardless of the identified risk factors in pregnant women.

REFERENCES

1. Dennis AT. Reducing maternal mortality in Papua New Guinea: contextualizing access to safe surgery and anesthesia. *Anesthesia and Analgesia*. 2018;126: 252–9.
2. Kementerian Kesehatan RI 2018 R. Data dan Informasi Profil Kesehatan Indonesia 2017. Igarss 2014. 2018;
3. Kassebaum NJ, Barber RM, Dandona L, Hay SI, Larson HJ, Lim SS, et al. Global, regional, and national levels of maternal mortality, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet*. 2016.
4. Say L, Chou D, Gemmill A, Tunçalp Ö, Moller AB, Daniels J, et al. Global causes of maternal death: A WHO systematic analysis. *Lancet Global Health*. 2014.
5. Kementerian Kesehatan RI. PMK No. 97 Tahun 2014 Tentang Pelayanan Kesehatan Kehamilan. Kemenkes RI. 2014.
6. Rasouli M, Pourheidari M, Gardesh Z. The Effect of self-care before and during pregnancy on the prevention and control of preeclampsia in high-risk women. *International Journal of Preventive Medicine*, 2019.
7. Wibowo N, R. I, E. F, M.K.K. K, J.C. M. Diagnosis dan tatalaksana preeklamsia. *Pogi*. 2016;6–9.
8. Peres G, Mariana M, Cairrão E. Pre-Eclampsia and Eclampsia: An Update on the Pharmacological Treatment Applied in Portugal. *Journal of Cardiovascular Development and Disease*. 2018;
9. Zanette E, Parpinelli MA, Surita FG, Costa ML, Haddad SM, Sousa MH, et al. Maternal near miss and death among women with severe hypertensive disorders: A Brazilian multicenter surveillance study. *Reproductive Health*. 2014.
10. Kahsay HB, Gashe FE, Ayele WM. Risk factors for hypertensive disorders of pregnancy among mothers in Tigray region, Ethiopia: A matched case-control study. *BMC Pregnancy Childbirth*. 2018.
11. Adamu AN, Okusanya BO, Tukur J, Ashimi AO, Oguntayo OA, Tunau KA, et al. Maternal near-miss and death among women with hypertensive disorders in pregnancy: a secondary analysis of the Nigeria Near-miss and Maternal Death Survey. *BJOG An International Journal of Obstetric and Gynaecology*. 2019.
12. Kurniasari D, Arifandini F. Hubungan usia, paritas dan diabetes mellitus pada kehamilan dengan kejadian preeklamsia pada ibu hamil di wilayah kerja Puskesmas Rumbia Kabupaten Lampung Tengah tahun 2014. *Jurnal Kesehatan Holistik*. 2015;9(3):142–50.
13. Shah S, Gupta A. Hypertensive Disorders of Pregnancy. *Cardiology Clinics*. 2019.
14. Skjærven R, Wilcox AJ, Lie RT. The interval between pregnancies and the risk of preeclampsia. *The New England Journal of Medicine*. 2002.
15. Tri Utami W, Studi Diploma III Akademi Kebidanan Wira Husada Nusantara Malang P. Hubungan usia, paritas, dan riwayat hipertensi dengan kejadian preeklamsia berat di Rumah Sakit Baptis Batu Malang. *Asuhan Kesehatan*. 2018.
16. Wiknjosastro H, Saifudin AB, Rachimadhi T. Ilmu kebidanan edisi 3. Jakarta: Yayasan Bina Pustaka Sarwono Wiknjosastro. 2002.
17. Dewa Ayu Rai Suastina. Pengaruh Pendidikan Kesehatan Terhadap Tingkat Pengetahuan Siswi Tentang Sadari Sebagai Deteksi Dini Kanker Payudara Di SMA Negeri 1 Manado. *Journal of Chemical Information Model*. 2013.
18. Lambert G, Brichant JF, Hartstein G, Bonhomme V, Dewandre PY. Preeclampsia: An update. *Acta Anaesthesiologica Belgica*. 2014.

