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Risk Factors for Pre-Eclampsia in Pregnant Women at RSUD dr. ABDUL Rivai Berau

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ABSTRACT

Based on medical record data from RSUD dr. Abdul Rivai Berau is known to have 395 cases of pre-eclampsia pregnant women in January-October 2023. Risk factors that play an important role in the occurrence of pre-eclampsia: To determine risk factors for pre-eclampsia in pregnant women was age, parity, history contraceptives and multiple pregnancies. Type of research carried out was quantitative research with an analytical survey research design and a retrospective design. The population is all data pre-eclampsia cases in pregnant women January to October 2023 totaling 395 people, the Slovin formula sample of 199 people was obtained. The sampling technique uses simple random sampling. Data analysis using ch square. Age not at risk 57.8%, multigravida parity 55.3%, no history of using hormonal contraceptives 54.3%, no multiple pregnancies 51.8% and classification of mild pre-eclampsia 54.3%. There is a relationship between age and incidence of pre-eclampsia (p value = 0.009). There is a relationship between parity and incidence of pre-eclampsia (p value = 0.026). There is a relationship between a history of hormonal contraceptive use and the incidence of pre-eclampsia (p value = 0.011). There is a relationship between multiple pregnancies and incidence of pre-eclampsia (p value = 0.014). Age, parity, history of using hormonal contraceptives and multiple pregnancies as risk factors for pre-eclampsia in pregnant women. It is hoped RSUD dr. Abdul Rivai Berau provides health counseling or education to pregnant women preventing pre-eclampsia by providing material related to risk factors for pre-eclampsia in pregnant women along with their treatment and prevention.

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1. Introduction

Maternal health is one of the issues that is paid attention to by the world of health globally, where health development is an important consideration in improving the level of public health. One of the indicators of public health status is the maternal mortality rate (MMR) and the infant mortality rate (IMR) (Kemenkes, 2020). Maternal Mortality Rate (MMR) according to the World Health Organization (WHO) in 2017around 810 people caused by pregnancy and childbirth. MMR occurs around 94% in low and lower middle income countries (WHO, 2019). Data (Committee, 2020), the MMR in ASEAN is

235/100,000 live births, where Indonesia ranks third in ASEAN with the highest MMR after Myanmar and Laos (Kemenkes, 2021).

The MMR in Indonesia in 2019 was4,197 people and in 2021 it will increase to 6,856 people. About 76% of AKI occurs in the labor and postpartum phase with a proportion of 24% occurring during pregnancy, 36% during labor and 40% postpartum (Kemenkes, 2021). The MMR in Indonesia in 2022 will be recorded at around 183 per 100,000 births (Kemenkes, 2021).The percentage of causes of AKI in Indonesia is bleeding 30.3%, pre-eclampsia and eclampsia 28.8%, infection 7.3%, prolonged labor 1.8%, abortion 1.6% and others 40.8% (Liszayanti, 2019).

The MMR in East Kalimantan Province in 2021 ranged from an average of 50 to 70 per 100,000 births, while data from the East Kalimantan Health Service in 2022 saw a maternal mortality rate of 73 deaths per year, where East Kalimantan was ranked 5th with the highest MMR and spread across all districts and cities (East Kalimantan Provincial Service, 2022).

Looking at this data, AKI is most often caused by pre-eclampsia, asPregnancy with hypertensive disorders occurs in pregnant women with a gestational age of more than 20 weeks which is characterized by increased blood pressure ≥ 140/90 MmHg accompanied by edema and proteinuria (Faiqoh, 2014). The cause of pre-eclampsia is blood vessel spasm accompanied by salt and water retention, so if all the arterioles in the body experience spasm, blood pressure will rise. This can cause an increase in blood pressure in pregnant women from mild to severe. The dangers of pre-eclampsia in pregnant women include disrupting the pregnant woman's kidneys, causing intrauterine fetal hypoxia, low birth weight of the baby and giving birth prematurely as well as neonatal asphyxia which can reduce oxygen and further increase carbon dioxide which can cause death (Prawiroharjo,2020).

If pre-eclampsia is not treated quickly and appropriately, pre-eclampsia can worsento severe pre-eclampsia (PEB) or eclampsia. Complications can arise in the mother if hypertension occurs during pregnancy, such as causing decreased kidney function, maternal death, pulmonary edema, myocardial infarction, and thrombocytopenia. The impacts that arise can also have an impact on the fetus, such as low birth weight (LBW) or fetal death (Nurdiana et al., 2023). Therefore,Good antenatal care (ANC) and delivery assistance by health workers are highly recommended for early detection and treatment of obstetric complications that may arise in pregnant women, giving birth and newborns, by detecting risk factors for pre-eclampsia (Nurtjahja, 2022).

Risk factors for pre-eclampsia include age, parity, multiple pregnancies, IDDM (Insulin Dependent Diabetes Mellitus), chronic hypertension, kidney disease, pregnancy with donor sperm, oocyte or embryo insemination, obesity before pregnancy, maternal occupation, and mother's education (Pratiwi, 2020). Meanwhile, according to Marianti (2021) put forwardPredisposing factors that influence the incidence of pregnancy with pre-eclampsia include history of pre-eclampsia, age, parity, knowledge, lifestyle, history of hypertension, diabetes, maternal occupation, education.

Age is a factor in the incidence of pre-eclampsia. Age is a very important reproductive status, which is closely related to the increase or decrease in a person's bodily functions. A good age for a woman to get pregnant is 20-35 years. Adolescents who are pregnant for the first time or women aged >35 years will be at risk of experiencing pre-eclampsia (Susiana, 2019).

In pregnant women from January to October 2023 there were 395 cases consisting of January there were 36 cases, February there were 19 cases, March there were 25 cases, April there were 18 cases, May there were 88 cases, June there were 69 cases, July there were 81 cases, August there were 22 cases, September there were 20 cases and October there were 17 cases (Data Dr. Hospital Abdul Rivai Berau, 2023). This data shows fluctuations in the incidence of pre-eclampsia from January to October 2023, with an average of 40 cases per month.

Based on medical record data from RSUD Dr. Abdul Rivai Berau is known to be a pre-eclampsia patientwith primiparous parity there are 24.2%, age ≥ 35 years or < 20 years there are 23%, history of using hormonal contraceptives 19%, multiple pregnancies there are 8% and so on.To reduce the incidence of pre-eclampsia, it is necessary to know the risk factors associated with the incidence of pre-eclampsia, where by knowing the relationship between the risk factors that cause pre-eclampsia, efforts can be made as early as possible to prevent pre-eclampsia by providing health education to pregnant women in

preventing risk factors. Based on this background, further analysis needs to be carried out to determine the risk factors for pre-eclampsia in pregnant women.

2. Research Methods

The type of research carried out was quantitative research with an analytical survey research design and a retrospective design. The population in this study was all data on pre-eclampsia cases in pregnant women at RSUD dr. Abdul Rivai Berau from January to October 2023 numbered 395 people and after selecting the sample using a simple random sampling technique, 199 people were selected and checked for completeness according to the inclusion and exclusion criteria. Data analysis using a quantitative approach includes Univariate Analysis and Bivariate Analysis.

3. Results and Discussions

3.1 Data analysis

a. Age

Identificationage in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau,can be seen in the following table:

Table 1. Frequency distributionage in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau

Age	f	Percentage (%)
Age at Risk	84	42.2
Age Is Not a Risk	115	57.8
Amount	199	100

Source: Secondary Data, 2024

b. Parity

Identificationparity in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau, can be seen in the following table:

Table 2. Frequency distributionparity in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau

Parity	f	Percentage (%)
Primigravida	89	44.7
Multigravida	110	55.3
Amount	199	100

Source: Secondary Data, 2024

3.2 History of Hormonal Contraceptive Use

Identificationhistory of use of hormonal contraceptives in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau, can be seen in the following table:

Table 3. Frequency distributionhistory of use of hormonal contraceptives in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau

History of Hormonal Contraceptive Use	f	Percentage (%)
There is a history of using hormonal contraceptives	91	45.7
There is no history of using hormonal contraceptives	108	54.3
Amount	199	100

Source: Secondary Data, 2024

3.3 Multiple Pregnancy

Identificationmultiple pregnancies in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau, can be seen in the following table:

Table 4. Frequency distributionmultiple pregnancies in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau

Multiple Pregnancy	f	Percentage (%)
Multiple Pregnancy	96	48.2
No Multiple Pregnancy	103	51.8
Amount	199	100

Source: Secondary Data, 2024

3.4 Classification of Pre Eclampsia

Identification classificationpre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau, can be seen in the following table:

Table 5. Classification frequency distributionpre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau

Classification of Pre Eclampsia	f	Percentage (%)
Severe Pre-Eclampsia	91	45.7
Mild Pre-Eclampsia	108	54.3
Amount	199	100

Source: Secondary Data, 2024

3.5 Connectionagewith eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau.

For analyze age relationship with eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau, can be seen in the table below:

Table 6. Relationshipagewith eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau

No	Age	Occurrence of Pre-Eclampsia				Total	%	*p value*
		Heavy		Light				
		n	%	n	%			
1	Risky	48	24.1	36	18.1	84	42.2	
2	No risk	43	21.6	72	36.2	115	57.8	*0.009
	Amount	91	45.7	108	54.3	199	100	

Source: Secondary Data, 2024

3.6 Parity relationship with eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau.

Foranalyzeparity relationshipwith eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau, can be seen in the table below:

Table 7. Relationshipparitywith eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau

No	Parity	Occurrence of Pre-Eclampsia				Total	%	*p value*
		Heavy		Light				
		n	%	n	%			
1	Primigravida	49	24.6	40	20.1	89	44.7	
2	Multigravida	42	21.1	68	34.2	110	55.3	*0.026
	Amount	91	45.7	108	54.3	199	100	

Source: Secondary Data, 2024

3.7 Connectionhistory of hormonal contraceptive usewith eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau.

Foranalyzerelationship between history of hormonal contraceptive usewith eventspre-

eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau, can be seen in the table below:

Table 8. Relationshiphistory of hormonal contraceptive usewith eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau

No	History of Hormonal Contraceptive Use	Occurrence of Pre-Eclampsia				Total	%	*p value*
		Heavy		Light				
		n	%	n	%			
1	There is	51	25.6	40	20.1	91	45.7	
2	There is no	40	20.1	68	34.2	108	54.3	*0.011
	Amount	91	45.7	108	54.3	199	100	

Source: Secondary Data, 2024

3.8 Connectionmultiple pregnancywith eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau.

Foranalyzemultiple pregnancy relationshipswith eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau, can be seen in the table below:

Table 9. Relationshipmultiple pregnancywith eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau

No	Multiple Pregnancy	Occurrence of Pre-Eclampsia				Total	%	*p value*
		Heavy		Light				
		n	%	n	%			
1	Multiple Pregnancy	53	26.6	43	21.6	96	48.2	*0.014
2	No Multiple Pregnancy	38	19.1	65	32.7	103	51.8	
	Amount	91	45.7	108	54.3	199	100	

Source: Secondary Data, 2024

3.9 Discussion

a. Age

Based on the research results, it is known that the age of pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai BerauMost of the ages were not at risk (20-35 years) amounting to 115 respondents (57.8%), while age at risk (<20 years and> 35 years)there were 84 respondents (42.2%).

The results of this study are in accordance with Andi's (2022) research showing that most pregnant women aged in the high risk age category, namely <20 years old and >35 years old, have a tendency to suffer from pre-eclampsia than mothers aged in the low risk age category (Gayatri et al., 2022). Nasifa's research (2023) shows that the majority of respondents who experienced pre-eclampsia with maternal age at risk were aged <20 or >35. Permadi's research (2019) shows that the majority of respondents experienced pre-eclampsia withhigh risk age (Permadi & Deliana, 2018).

Researchers assume thatage in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai BerauMost ages are not at risk (20-35 years), which is the safe age for pregnancy, howeverPregnant women under 20 years of age easily experience an increase in blood pressure and cause seizures more quickly due to immature reproductive organs. Meanwhile, when pregnant women are over 35 years old, as they get older, they are susceptible to a decline in a person's bodily functions, which can lead to an increase in blood pressure.

b. Parity

Based on the research results, it is known that parity in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai BerauMost of the multigravidas were 110 respondents (55.3%), while primigravidathere were 89 respondents (44.7%).

The results of this study are in accordance with Andi's (2022) research showing that the majority of respondents who experienced pre-eclampsia were primiparous. Nasifa's research (2023) shows that the majority of respondents who experienced pre-eclampsia were primiparous (Gayatri et al., 2022). (Transyah, 2018) shows that the majority of respondents who experienced pre-eclampsia were primiparous.

Primiparas often experience stress in facing childbirth, causing an increase in the release of corticotropic-releasing hormone (CRH) by the hypothalamus, which then causes an increase in cortisol which can increase cardiac output and increase blood pressure. As for multiparas, the endometrial environment around the implantation site is less than perfect and is not ready to accept the products of conception, so that providing nutrition and oxygenation to the products of conception is less than perfect and results in the growth of the products of conception being disrupted, which can increase the risk of preeclampsia (Lisnawati & Rani Widiyanti, 2020).

Researchers assume thatparity in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Beraumost are multigravidas. This is becauseThe endometrial environment around the implantation site is less than perfect and not ready to accept the products of conception, so that providing nutrition and oxygenation to the products of conception is less than perfect and results in the growth of the products of conception being disrupted, which can increase the risk of pre-eclampsia.Apart from that, although the incidence of pre-eclampsia in mothersMultigravida can be caused by an unsafe or risky pregnancy interval of less than two years.

c. History of Hormonal Contraceptive Use

Based on the research results, it is known that the history of using hormonal contraceptives in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Beraumost of them are not therehistory of using hormonal contraceptivesamounting to 108 respondents (54.3%), while there ishistory of using hormonal contraceptivestotaling 91 respondents (45.7%).

The results of this study are in accordance with research by Hayati (2022) showing that the majority of pregnant women who experience pre-eclampsia have a history of using hormonal contraceptives (Haryati et al., 2022). Muzalfah's (2018) research shows that the majority of pregnant women who experience pre-eclampsia have a history of using hormonal contraceptives (Muzalfah et al., 2018).

Researchers assume thathistory of use of hormonal contraceptives in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Beraumost of them are not therehistory of using hormonal contraceptives. This is because some of the respondents were pregnant for the first time and had not used contraception or the pregnancy was close to a previous pregnancy so they had not used contraception, and there were also those who used non-hormonal contraceptives. Hormonal contraceptives contain the hormones estrogen and progesterone which can increase blood pressure due to cardiac hypertrophy and increase the response to the angiotensin II pressor by involving the Renin Angiotensin System pathway.In addition, the incidence of pre-eclampsia in mothers withA history of using hormonal contraceptives may be related to the length of time of use compared to the current pregnancy.

d. Multiple Pregnancy

Based on the research results, it is known that multiple pregnancies in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Beraumost of them were not multiple pregnancies, 103 respondents (51.8%), while multiple pregnanciesthere were 96 respondents (48.2%).

The results of this study are in accordance with Rahayu's (2023) research showing that the majority of pregnant women who experience pre-eclampsia experience multiple pregnancies (Rahayu, 2023). Study Linhares et al (2020) showed that women with twin pregnancies, when compared with singleton pregnancies, showed a significantly higher incidence of gestational hypertension (13 versus 6%) and preeclampsia (13 versus 5%). Parantika's research (2021) shows that the majority of pregnant women who experience pre-eclampsia experience multiple pregnancies (Parantika et al., 2021).

Researchers assume thatmultiple pregnancies in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Beraumost are not multiple pregnancies. This is because the respondent has a single pregnancy but has other risk factors that cause pre-eclampsia, which is the case with multiple pregnanciesIncreasing cardiovascular workload causes a higher risk of hypertension and leading to pre-eclampsia.

e. Classification of Pre Eclampsia

Based on the research results, it is known thatclassificationpre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai BerauMost of them had mild pre-eclampsia, 108 respondents (54.3%), while pre-eclampsia is severethere were 91 respondents (45.7%).

The results of this study are in accordance with Rahayu's (2023) research showing that the majority of pregnant women experience severe pre-eclampsia (Rahayu, 2023). Nasifa's research (2023) shows that the majority of pregnant women experience severe pre-eclampsia. Meanwhile, Permadi's research (2019) shows that the majority of pregnant women experience mild pre-eclampsia (Permadi & Deliana, 2018).

Researchers assume that the incidentpre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai BerauMost pre-eclampsia is mild. This is becausea condition where there is an increase in blood pressure of 140/90 MmHg or more in the mother's blood pressure measurement position, either sitting or supine, which is caused by various risk factors such as age, parity, history of using hormonal contraceptives and multiple pregnancies.

f. Connectionagewith eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau.

Based on the research results, it is known thatof 84 age respondentsat risk (<20 years or >35 years), the highest proportion of severe pre-eclampsia was 48 respondents (24.1%), but there weremild pre-eclampsiatotaling 36 respondents (18.1%). Meanwhile, 115 respondents were agednot at risk (20-35 years), the highest proportion of mild pre-eclampsia was 72 respondents (36.2%), but there weresevere pre-eclampsiatotaling 43 respondents (21.6%). The statistical test results showed that p value = 0.009 < α : 0.05 so that Ha was accepted, that is, it existedage relationshipwith eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau.

The results of this research are in accordance with Andi's (2022) research showing that there isconnectionagewith eventspre-eclampsia in pregnant women with pre-eclampsia (Gayatri et al., 2022). Nasifa's research (2023) shows that there isconnectionagewith eventspre-eclampsia in pregnant women with pre-eclampsia. Permadi's research (2019) shows that there isconnectionagewith eventspre-eclampsia in pregnant women with pre-eclampsia (Permadi & Deliana, 2018).

Researchers assume thatThere isconnectionagewith eventspre-eclampsia in pregnant women with pre-eclampsia. This is because in very young pregnant women aged <20 years there are pathological changes, namely the occurrence of spasm of arteriolar blood vessels leading to important organs in the body, causing disruption of tissue metabolism, disruption of blood circulation to the retroplacenter, while the mother's body is not ready for pregnancy. Likewise, pregnant women aged >35 years decline in the function of body organs, one of which is the kidneys, causing protein in the urine to increase blood pressure.

g. Parity relationship with eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau.

Based on the research results, it is known thatof 89 parity respondentsprimigravida (a woman who is pregnant for the first time), the highest proportion of severe pre-eclampsia was 49 respondents (24.6%), but there weremild pre-eclampsiatotaling 40 respondents (20.1%). Meanwhile, 110 respondents had paritymultigravida (women who have been pregnant and given birth), the highest proportion of mild pre-eclampsia was 68 respondents (34.2%), but there weresevere pre-eclampsiatotaling 42 respondents (21.1%). The statistical test results obtained p value = 0.026 < α : 0.05 so that Ha was

accepted, that is, it existedparity relationshipwith eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau.

The results of this research are in accordance with Andi's (2022) research showing that there isparity relationship with eventspre-eclampsia in pregnant women with pre-eclampsia (Gayatri et al., 2022). Nasifa's research (2023) shows that there isparity relationship with eventspre-eclampsia in pregnant women with pre-eclampsia. (Transyah, 2018) shows that there isparity relationship with eventspre-eclampsia in pregnant women with pre-eclampsia.

Parity is the number of live pregnancies above 28 weeks' gestation (Manuaba, 1998). The results of conception itself influence parity. It needs to be anticipated that mothers who have given birth 4 times or more are more at risk of falling into a state of malnutrition and anemia or a lack of iron levels in the body which results in too few red blood cells (Kemenkes, 2020). Parity is classified as safe if there are less than 3 live births. But if there are more than 3 live births, the death rate is higher. The higher the parity, the higher the maternal mortality rate (MMR) (Transyah, 2018).

Researchers assume thatThere isparity relationship with eventspre-eclampsia in pregnant women with pre-eclampsia. This is because in the first pregnancy or primigravida, the formation of inhibitory antibodies against placental antigens is not yet complete (it will be perfect in subsequent pregnancies). So primigravida has an increased risk of preeclampsia than multigravida.

h. Connectionhistory of hormonal contraceptive usewith eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau.

Based on the research results, it is known thatof 91 respondents there werehistory of hormonal contraceptive use, the highest proportion of severe pre-eclampsia was 51 respondents (25.6%), but there weremild pre-eclampsiatotaling 40 respondents (20.1%). Meanwhile, there were none in 108 respondentshistory of hormonal contraceptive use, the highest proportion of mild pre-eclampsia was 68 respondents (34.2%), but there weresevere pre-eclampsiatotaling 40 respondents (20.1%). The statistical test results showed that p value = 0.011 < α : 0.05 so that Ha was accepted, that is, it existedrelationship between history of hormonal contraceptive usewith eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau.

The results of this research are in accordance with Hayati's (2022) research showing thatthere is a relationshiphistory of hormonal contraceptive usewith eventspre-eclampsia (Haryati et al., 2022). Muzalfah's (2018) research shows thatthere is a relationshiphistory of hormonal contraceptive usewith eventspre-eclampsia (Muzalfah et al., 2018).

Researchers assume that there is a relationshiphistory of hormonal contraceptive usewith eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau. This is becauseContraceptive use before pregnancy has a significant effect on the incidence of pre-eclampsia in these individuals. Most hormonal contraceptives contain the hormones estrogen and pregesterone. The hormones in contraception have been regulated in such a way that they approach the hormone levels in the acceptor's body. However, if used for a long period of time it will cause other side effects. These two hormones have the ability to facilitate the retention of sodium ions and water secretion accompanied by an increase in plasma renin activity and the formation of angiotensin, which can trigger an increase in blood pressure.

i. Connectionmultiple pregnancywith eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau.

Based on the research results, it is known thatof 96 respondentsmultiple pregnancy, the highest proportion of severe pre-eclampsia was 53 respondents (26.6%), but there weremild pre-eclampsiatotaling 43 respondents (21.6%). Meanwhile, 103 respondents did not have multiple pregnancies, the highest proportion of mild pre-eclampsia was 65 respondents (32.7%), but there weresevere pre-eclampsiatotaling 38 respondents (19.1%). The statistical test results showed that p value = 0.014 < α : 0.05 so that Ha was accepted, that is, it existedmultiple pregnancy relationshipswith eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau.

The results of this research are in accordance with Rahayu's (2023) research showing thatthere is a relationshipmultiple pregnancywith eventspre-eclampsia in pregnant women with pre-eclampsia (Rahayu, 2023). Study Linhares et al (2020) show thatthere is a relationshipmultiple pregnancywith eventspre-eclampsia in pregnant women with pre-eclampsia. Parantika's research (2021) shows thatthere is a relationshipmultiple pregnancywith eventspre-eclampsia in pregnant women with pre-eclampsia (Parantika et al., 2021).

Researchers assume that there is a relationshipmultiple pregnancywith eventspre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau. This is because multiple pregnancies have a risk of experiencing pre-eclampsia. In multiple pregnancies there are greater cardiovascular changes, with more than one fetus, it can worsen the mother's physiological response to pregnancy. Pregnant women with multiple pregnancies have a large placenta, which causes a decrease in placental perfusion. Excessive placental tissue is unlikely to receive adequate perfusion compared to pregnant women with singleton pregnancies, thereby increasing the risk of pre-eclampsia. Therefore, women with multiple pregnancies require special attention and close monitoring during pregnancy.

4. Conclusion

From the results of research and discussion regarding risk factors for pre-eclampsia in pregnant women at RSUD dr. Abdul Rivai Berau, concluded that the age of pre-eclamptic pregnant women at RSUD dr. Most of Abdul Rivai Berau's age group is not at risk (20-35 years). Parity of pre-eclamptic pregnant women at RSUD dr. Abdul Rivai Berau is mostly multigravida. History of use of hormonal contraceptives by pregnant women with pre-eclampsia at RSUD dr. Most of Abdul Rivai Berau has no history of using hormonal contraceptives. Multiple pregnancies of pre-eclamptic pregnant women at RSUD dr. Abdul Rivai Berau mostly does not have multiple pregnancies. Classification of pre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau mostly has mild pre-eclampsia. There is a relationship between age and the incidence of pre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau. There is a relationship between parity and the incidence of pre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau. There is a relationship between the history of hormonal contraceptive use and the incidence of pre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau. There is a relationship between multiple pregnancies and the incidence of pre-eclampsia in pregnant women with pre-eclampsia at RSUD dr. Abdul Rivai Berau. The limitation of the research is that data collection is secondary so that each variable cannot be assessed specifically, such as the use of hormonal birth control which only sees whether or not you have used it, but it is not known how long you have used hormonal birth control which may have an effect on the incidence of pre-eclampsia. Likewise, parity was not asked further about the distance of pregnancy. There are other factors that affect the risk of pre-eclampsia in pregnant women that are not studied such as obesity, history of hypertension, frequency of antenatal care and so on. It is hoped that future research can analyze other factors that affect the risk of pre-eclampsia and use data collection techniques that can be specifically assessed.

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