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The rate of preeclampsia incidence in early pregnancy

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ABSTRACT

Preeclampsia is the leading cause of morbidity and mortality in mothers during perinatal period, accounted for 70.000 mother deaths and 500.000 fetal death reported each year. Adolescent have not been set as the risk factor in guidelines to develop preeclampsia due to inconsistencies in literature findings. This study is a cross-sectional study which aims to find the incidence rate of preeclampsia and its complications in adolescent pregnancy located in Ciawi Regional Hospital during 2014-2016. This study involved patients aged 15-20 years old with complication of hypertension in pregnancy. This study found that 102 pregnant mothers with hypertension complication and 69 of them (67,6%) diagnosed as preeclampsia. Neonatal complication found in this study were 14,5% low-birth weight, 2,9% high-birth weight, and 26,1% IUFD. Maternal complication found were 24,6% preterm delivery, 2,9% post-term delivery, two patients (2%) with anemia, and one patient (1%) with uterine inertia, uterine rupture, and decompensated cordis. More than half of the sample in this study population were diagnosed with preeclampsia followed with various maternal and neonatal complications.

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INTRODUCTION

Preeclampsia is a hypertensive condition of pregnancy that affects 3% to 7% of nulliparous pregnancies (Serra *et al.*, 2020; Von Versen-Hoÿnck *et al.*, 2020). Preeclampsia has always been a major cause of maternal and perinatal morbidity and mortality, with 70,000 maternal deaths and 500,000 infant deaths reported annually (Macedo *et al.*, 2020). There are 25% of babies born to women with preeclampsia report that stunted growth, with another third being born premature (Leftwich & Alves, 2017; Phipps et al., 2016; Sharami et al., 2019; Sukmawati E et al., 2018).

The 2019 National Institute for Health and Care Excellence (NICE) guidelines classify a woman as being at high risk of developing preeclampsia if she has a history of hypertensive disease during a previous pregnancy, including chronic kidney disease, autoimmune disease, diabetes, or chronic hypertension (Fitriani *et al.*, 2021; *Kemenkes RI Dirjen P2P*, 2020). In addition, some literature states that the risk of preeclampsia also increases in teenage pregnancies and young adults (≤ 20 years) with worse pregnancy outcomes in certain cases (Brosens *et al.*, 2019; Majak *et al.*, 2016; P.E. *et al.*, 2017).

The mechanism for the increased risk of preeclampsia in teenage pregnancies has still debated due to the varying incidence reports between studies (Fitriani *et al.*, 2021; Serra *et al.*, 2020). However, the intrinsic factors (uterine conditions and the decidualization process) and the extrinsic factors (increased malnutrition in adolescents, abusive partners, emotional overload) have been investigated to have a role in the incidence of preeclampsia in adolescents. (Brosens *et al.*, 2019), (Dutta *et al.*, 2019; Macedo *et al.*, 2020; Rosales-Ortiz *et al.*, 2019). These factors also increase the poor outcome and complications of preeclampsia which are separated as maternal and neonatal complications (Li et al., 2018; Nzelu et al., 2018; SA, 2019; Sukmawati, 2017). Adolescence has not been established as a risk factor for the occurrence of preeclampsia in several guidelines due to the inconsistency of the results related to previous literature with the weaknesses and strengths of their studies. Based on the description above, this study was conducted to determine the incidence of preeclampsia and its complications in early pregnancy at Ciawi Hospital during 2014-2016.

RESEARCH METHOD

This research is a descriptive study with a cross-sectional study design (Fajarwati & Irianto, 2021; Sugiyono, 2019). This study used the method of observation and evaluation of secondary data (medical records) to determine the incidence of preeclampsia and its complications in early pregnancy at the Ciawi Regional General Hospital (RSUD) for the period 2014 - 2016. This research was conducted at Ciawi Regional Hospital in January - March 2022 with the research subjects of pregnant women who met the inclusion criteria, such as pregnant women aged less than 20 years who had examinations and deliveries at Ciawi Hospital during 2014–2016 and had complete medical record data. The collected data was processed using the SPSS program and presented in the form of tables and graphs.

RESULTS AND DISCUSSIONS

Characteristics of Research Subjects

Pregnant women who met the inclusion criteria totalled 102 patients. Based on the table, the mean age of the patients was 18.74 ± 1.25 years with the youngest mother was 15 years and the oldest was 20 years. Most of the pregnant women were primigravidas (92.2%), at term (75.5%), through spontaneous delivery (58.8%) and, all pregnant women had never had an abortion. In this study, the mean age of the mother was 18.74 ± 1.25 years with an age range of 15-20 years. Slightly different from several previous studies on research which involved teenage pregnancy and the risk of preeclampsia. For example, the population-based epidemiological study by Leppalahti *et al.* in Finland involving adolescents 13-19 years. This study concluded that the younger the pregnant woman, the greater the risk of neonatal and maternal complications, including preeclampsia (Child, 2015).

In addition, most of the mothers in this study were *nulliparas*. According to a review conducted by Rosales-Ortiz *et al.*, 73-93% cases of pregnant adolescents are women giving birth to their first child. Risk factors for teenage pregnancy included low education level, starting sexual activity before the age of 15, lack of social support, history of maternal pregnancy during adolescence, and lack of knowledge of and access to birth control methods (Macedo *et al.*, 2020). Most of the pregnant women in this study gave birth spontaneously vaginally (58.8%). These results are consistent with a study conducted by Leppalahti *et al.*, which stated that adolescents are more likely to deliver vaginally without labor complications when compared to reference (adult) women (Fitriani *et al.*, 2021; Mönckeberg *et al.*, 2020; You *et al.*, 2018).

Table 1. Characteristics of Research Subjects

Characteristics	Characteristics	%	Rerata±SB	Median (Min-Max)
Age (Years)	Age (Years)		18,74±1,25	19 (15-20)
Gravida	Gravida			
Primigravida	94	92,20		
Multigravida	8	7,80		
Gestational Age	Gestational Age		38,11±3,35	40 (25-43)
Pre-Term	23	22,50		
term	77	75,50		
Post-Term	2	2,0		
Type of Childbirth	Type of Childbirth			
Normal	60	58,80		
Sectio Caesarea	36	35,30		
Vacuum Extraction	6	5,9		

Preeclampsia Incidence Rate

Based on Figure Diagram 1, which obtained from 102 pregnant women with complications of hypertension, 69 patients (67.6%) met the diagnostic criteria for preeclampsia, and 33 other patients (32.4%) were diagnosed with hypertension in pregnancy who did not meet the diagnostic criteria for preeclampsia.

This figure cannot be compared with previous studies because the study subjects only included patients with complications of hypertension and did not compare with the general early pregnancy population. Previous studies conducted in early pregnancies without complications of hypertension have shown that the incidence of preeclampsia in early pregnancies ranges from 2-7% worldwide (Macedo *et al.*, 2020).

Neonatal Outcomes and Complications

Birth weight babies are grouped into low birth weight (LBW), normal, and excess birth weight (BBLB). In this study, the output of 10 babies (14.5%) had LBW, 2 babies (2.9%) had LBW, there were also 18 fetuses (26.1%) who died or intra uterine fetal death (IUFD).

Table 2. Outcomes and Complications in Neonatal

Neonatal Complications Outcome	**Frequency**	%
Low Birth Weight (LBW)	10	14,5%
Large Birth Weight	2	2,9%
Intra Uterine Fetal Death (IUFD)	18	26,1%

Maternal Outcomes and Complications

Maternal complications found in this study that 69 research subjects who were diagnosed with preeclampsia, there were 17 patients (24.6%) who had preterm labor, and 2 patients (2.9%) had postterm delivery. Several other complications were also found, including; 1 patient (1%) had uterine inertia, 1 patient (1%) had uterine rupture, 1 patient (1%) had decom cordis, 1 patient (1%) had decom cordis with anasarca edema, and 2 patients (2.0) %) had anemia.

Table 3. Maternal Outcomes and Complications

Maternal Outcome of Complications	Frequency	%
Preterm Labor	17	24,6%
Posterm Labor	2	2,9%
Uterine Inertia	1	1%
Uterine Rupture	1	1%
Decom Kordis with Edem Anasarka	1	1%
Decom Kordis	1	1%
Anemia	1	1%

CONCLUSION

Based on the results of research conducted by the researchers on the incidence of preeclampsia in early pregnancy at Ciawi Hospital during 2014-2016, it was concluded that out of 102 study samples, 69 patients (67.6%) were diagnosed with preeclampsia. Neonatal complications in this study showed that 10 babies (14.5%) had LBW, 2 babies (2.9%) had LBW, also 18 fetuses (26.1%) who died or intra uterine fetal death (IUFD). Maternal complications found in this study were 17 patients (24.6%) who experienced preterm delivery, and 2 patients (2.9%) experienced postterm delivery. Several other complications were also found, including; 1 patient (1%) had uterine inertia, 1 patient (1%) had uterine rupture, 1 patient (1%) had decom cordis, 1 patient (1%) had decom cordis with anasarca edema, and 2 patients (2.0) %) had anemia.

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