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Overview of Preeclampsia Risk Factors on Pregnant Women at Dr. Soekardjo Hospital, Tasikmalaya, Indonesia

Etty Komariah Sambas*[1], Enok Nurliawati[2]
[1, 2]Nursing Diploma Program
Sekolah Tinggi Ilmu Kesehatan Bakti Tunas Husada, Tasikmalaya, Indonesia
*ekasambas.73@gmail.com

Abstract— **Objective: The study aimed to identify risk factors of preeclampsia on pregnant women including mother's age, gestational age, weight gain, pregnancy type, history of hypertension, number of children's births (parity), history of disease, and history of preeclampsia. Method: The research design was descriptive research. Sampling technique used consecutive sampling. The Total samples were 104 respondents. Results and Discussion : The result showed that as many as 60% of the mother's age ≥ 35 years, 100% of the third trimester of pregnancy, 100% of respondents were single pregnancy, 30% of the respondents experienced body weight increase of 11kg, 60% of the respondents had no history of hypertension, 80% of the respondents had parity 1-5 times (multipara), 100% of respondents did not have history of diabetes disease nor kidney disease, and 60% of respondents did not undergo preeclampsia previously. Conclusion: The most common risk factors of preeclampsia are gestational age and types of pregnancy which had a 100%** occurrence **while the rest risk factors contributed to preeclampsia.**

Keywords: preeclampsia, pregnancy

I. INTRODUCTION

Pregnancy is the result of conception between the egg cells (ovum) with spermatozoa followed by physiological and psychological changes [1]. Pregnancy can be experienced normally or with complications. Some of the complications in pregnancy include abortus, ectopic pregnancy, abruption placenta, hyperemesis gravidarum, diabetes mellitus in pregnancy, placental detach, placenta previa, bleeding, uterine rupture without scarring, chronic hypertension, eclampsia, and preeclampsia. Preeclampsia is one of the causes of maternal and infant mortality. Preeclampsia is a condition where hypertension is accompanied by proteinuria, edema, or both that occur due to pregnancy after the 20th weeks of gestation or sometimes earlier.[1].The effects resulting from preeclampsia in pregnancy for mothers are miscarriage, renal failure, lung swelling, cerebral bleeding, intravascular blood clotting, and eclampsia. In infants, preeclampsia can prevent the placenta from receiving adequate blood intake so that infants can lack of oxygen *(hypoxia)* and food. Complications often found in preeclampsia-eclampsia include low birth weight infants, intrauterine fetal death (IUFD), asphyxia, post-natal bleeding, early neonatal death, and other complications. In addition to the National Institute for Health and Care Excellence (2013)[2], hypertension disorder in pregnancy carries an impact on the baby. In the UK is reportedly a perinatal death of 1 in 20 infant births experiencing a stillborn baby without congenital abnormalities occurring in women with preeclampsia. Premature birth also occurs in pregnant women with preeclampsia that is 1 in 250 females in their first pregnancy will give birth before 34 weeks, and 14-19% in women with preeclampsia experienced low birth weight baby. [3]. Complications in mothers due to preeclampsia contribute to maternal mortality.

Maternal mortality is still one of the health problems of mother and child in Indonesia. The rate of maternal mortality in Indonesia, which reached 359 per 100,000 live births, is still far from the target of Sustainable Development Goals (SDGs) which in 2030 maternal mortality should until below 70 per 100,000 live births[4]. WHO (1998-2008,) stated that the death of mothers in the world reached 342,900 deaths annually and was accompanied by a third of neonatal death. WHO report stated that there were about 287,000 maternal deaths in 2010 consisting of Sub-Saharan Africa (56%) and South Asia (29%) and about 85% (245,000 maternal deaths) occurred in developing countries. While in the countries of Southeast Asia were 150 thousand per 100,000 live births[5]. Indonesia is ranked 14th out of 18 countries in the Association of Southeast Asian Nations (ASEAN) and is ranked 5th highest in the South East Asia Region (SEARO) [6]. Preeclampsia and eclampsia are thought to be the cause of maternal mortality of 14% annually and are associated with neonatal mortality and morbidity rates and high maternal death [7]. In some developed countries such as Australia and the United Kingdom, preeclampsia was a major cause of maternal death. The preeclampsia figures in Australia amounted to 10-25%, in the UK by 100 per 1 million pregnancies [8]. In the United States preeclampsia is also the cause of 15% premature birth and 17.6% of maternal deaths [7]. Based on the Indonesian Health Demographics Survey (SDKI) in 2012, the direct causes of maternal mortality in Indonesia are bleeding (42%), eclampsia/preeclampsia (13%), abortion (11%), infection (10%), prolonged labor (9%), and

other causes 15%[4]. Preeclampsia in developing countries ranges from 0.3% to 0.7%, while in the more developed countries the preeclampsia is in a smaller number ranging from 0.05% to 0.1%. In Indonesia preeclampsia t and eclampsia is the cause of maternal mortality 1.5% to 25%, while the death of infants between 45% to 50% [9]

Many factors lead to an increased incidence of preeclampsia in pregnant women. Risk factors that may increase the incidence of preeclampsia include nullipara, age less than 20 years or more than 35 years, fetal more than one, multipara, chronic hypertension, diabetes mellitus or kidney disease. Preeclampsia/eclampsia is influenced also by parity, genetics and environmental factors [10].

Preliminary data Survey conducted in the Ward 1 dr. Soekardjo Hospital Tasikmalaya City on February 2019, showed that the number of pregnant women who experienced preeclampsia in the Ward 1 dr. Soekardjo Hospital Tasikmalaya City from January-November 2018 Was 525, with the highest number in November 2018 (11.80%). The study aimed to identify the risk factors of preeclampsia on pregnant women at dr. Soekardjo Hospital, Tasikmalaya City.

II. MATERIAL AND METHOD

A. Procedure

The research design was descriptive study. The population was all pregnant women who experienced preeclampsia at Ward 1 dr. Soekardjo Hospital in Tasikmalaya City. Sampling technique used consecutive sampling. Inclusion criteria were pregnant women with signs of preeclampsia (hypertension, proteinuria, edema and do not have complications in pregnancy. The number of samples which fulfill the criteria was 104 respondents. Data collected from January to May 2019.

B. Data Analysis

Data were analyzed by univariate analysis. The result of the analysis is presented in the table of frequency distribution.

III. RESULTS

The frequency distribution of preeclampsia risk factors for pregnant women are shown in Table 1. Result showed that 60 % of respondents' age was ⩾35 years, 100% gestational age were 28-40 weeks (Trimester III), 100% single pregnancy, 30% weight gain during pregnancy were 11 kg, 60% had no history of hypertension, 80% were multipara, and 60 % had no history of preeclampsia in previous pregnancy.

TABLE 1: FREQUENCY DISTRIBUTION OF PREECLAMPSIA RISK FACTORS ON PREGNANT WOMEN

No	Risk factors of preeclampsia	n	%
1	**Age**		
	• ≤20 year	0	0
	• 21- 35 year	42	40
	• ≥35 year	62	60
2	**Gestational age**		
	• 0-12 weeks (Trimester I)	0	0
	• 13-27 weeks (Trimester II)	0	0
	• 28-40 weeks (Trimester III)	104	100
3	**Types of pregnancy**		
	• Single pregnancy	104	100
	• Multiple pregnancy	0	0
4	**Weight gain during pregnancy**		
	• 8 kg	21	20
	• 10 kg	10	10
	• 11 kg	31	30
	• 12 kg	21	20
	• 14 kg	21	20
5	**History of hypertension**		
	• Yes	42	40
	• No	62	60
6	**Parity**		
	• Primipara	10	10
	• Multipara	80	80
	• Grandmultipara	10	10
7	**Hystory of preeclampsia in previous pregnancy**		
	• Yes	42	40
	• No	82	60

IV. DISCUSSION

The results showed that most of the respondents were in the old category (≥ 35 years). Older women have higher levels of risk of childbirth complications compared with the younger ones. For women over 35 years old, other than the physical start to weaken, it is also possible to appear various risks of health disorders, such as high blood pressure, diabetes, and various other diseases including preeclampsia [11]. George EM (2006) [12] stated that women at 35 years are easier to experience a variety of health problems one of hypertension and preeclampsia, this is due to the occurrence of changes in the uterine structure and birth canal is not flexible anymore. In the cardiovascular system, blood pressure increases as age increases, causing edema and proteinuria. The result is in line with the research of Situmorang (2016)[13] who mentioned that pregnant women without hypertension who are at risk of experiencing preeclampsia are women aged ≥ 35 years. Age group ≥ 35 years has a significant relationship with the occurrence of preeclampsia.

The results showed that all respondents were in the 3rd trimester (28-40 weeks). The results support the theory of placental implantation ischemia by Manuaba (2010). He stated that the incidence of preeclampsia increased in the gestational age for more than 28 weeks, because of increased fibrinogen levels and it would be more increase in pregnant women who had preeclampsia. The study which was conducted by Marlianti (2016) concluded that there was a significant relationship between gestational age and preeclampsia (p-value = 0,016), however, women's age had a greater influence on preeclampsia compares to gestational age, with OR = 3,956 (CI 95%= 1,154-13,565).

The results showed that all respondents experienced a single pregnancy. The number of fetuses conceived affects the occurrence of preeclampsia. Multiple pregnancies may increase the risk of preeclampsia by 2.36 times compared to single fetal pregnancies. Preeclampsia will occur in 30% of multiple pregnancies but it is possible for pregnant women with a single pregnancy can have a risk of preeclampsia. The results of this research are similar to those done by Rozikhan (2007), which stated that there was no relationship between multiple pregnancy history with preeclampsia [3].

The results showed that as much as 30% of respondents had a weight gain of 11 kg. Weight gain in pregnant women determines the health of mothers and fetuses. Obesity triggers the occurrence of preeclampsia through several mechanisms, i.e. the triggers of metabolites and other micro molecules. The risk of preeclampsia increased by 2-fold for weight gain of 5-7 kg/m2. Also besides, it was found that increased risk of preeclampsia related to an increase in *BMI*.[14]

The results showed that 60 % of respondents had no history of hypertension. Situmorang (2016) [13] stated that most pregnant women perceive that the history of hypertension does not become a risk factor of preeclampsia. They assumed that as long as they can maintain their health and avoid restrictions that trigger hypertension, they would be able to modify their lifestyle. The result of this research is contrary to the study carried out by Rozikhan (2007). He mentioned that there was a significant relationship between mothers who have a history of hypertension with the occurrence of preeclampsia [15]

The results showed that as much as 80% of respondents had parity of 1-5 times (multipara). Multipara tends to experience increased blood pressure during pregnancy. Blood test result of normal pregnancy shows an increase in angiotensin, renin, and aldosterone as compensation so that blood circulation and metabolism can occur. The number of children more than four can influence maternal and perinatal deaths. Too many children born can decrease reproductive health with risks such as miscarriage, anemia, severe bleeding, preeclampsia, eclampsia, placenta previa, and low birth weight newborn[16]. Wiknjosastro (2010) [17] stated that the incidence of preeclampsia is greater in pregnancy and frequent childbirth, which in multipara occurs changes in the elasticity of the reproductive structures including blood vessels, so it occurs increased fluid retention and embossed hypertension accompanied by edema and proteinuria. However, the result is contradictory to the results of the research performed by Denantika, Serudji, & Revilla (2015)[18] which mentioned that primipara tends to undergo preeclampsia compared with multipara.

The results showed that all respondents (100%) had no history of diabetes nor kidney disease. Women who had a history of the disease have an opportunity of 2.786 times to experience preeclampsia compared to women who had no history of diseases, (Main, 2010). However, Kurniasari (2014) mentioned that the history of diseases such as diabetes mellitus and kidney disease are very influential for preeclampsia.

The results showed 60% of respondents had never had preeclampsia. According to Agustin & Indriani (2012) [19], a woman who once had a history of preeclampsia, mola pregnancy, and multiple pregnancy is likely to undergo preeclampsia again in subsequent pregnancies, especially if she had chronic high blood pressure before pregnancy.

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Efforts to reduce the risk factors of preeclampsia at the age of mothers more than 35 years is to provide health promotion about contraceptives because the age of mothers more than 35 years is very susceptible to have complications in pregnancy. Efforts to reduce preeclampsia risk factors such as weight gain more than standard, hypertension, parity (multipara), and preeclampsia history are antenatal care with the minimum standard of Indonesia Health Ministry (2018) and maintaining the healthy diet.

V. CONCLUSION

The conclusion in this study, we provide information about the risk factors of preeclampsia on pregnant women. The most common risk factors of preeclampsia are gestational age and types of pregnancy which has a 100% occurrence in pregnant women with preeclampsia while the rest risk factors contribute to preeclampsia including age, weight gain during pregnancy, history of hypertension, parity, and history of preeclampsia in the previous pregnancy.

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