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## Prevent Mortality Rates of Pregnant Women in Preeclampsia Condition Based on Characteristics Analysis (Case Study in RSUD Dr. Mohammad Soewandhie Surabaya 2017)

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### ABSTRACT

**Background:** Preeclampsia is the leading cause of the deaths of pregnant women in Indonesia (30.9%). The cause of preeclampsia until now is not known for sure.

**Objective:** The purpose of this study was to determine the characteristics of preeclamptic pregnant women based on age, parity, Body Mass Index, history of hypertension, family history of hypertension, and level of education.

**Method:** The research method is descriptive retrospective study. The sampling technique is total sampling. The sample in this study were preeclamptic pregnant women in RSUD Dr. Mohammad Soewandhi Surabaya in the period of 1 January up to 31 Desember 2017 amounting to 100 samples.

**Result:** The results showed that 55% of preeclampsia pregnant women aged > 35 years, 65% of primipaternity preeclampsia mothers, 63% obesity, 67% had no history of hypertension, 78% had no family history of hypertension, and level of education does not affect the condition.

**Conclusion:** The highest risk factors for preeclampsia are age > 35 years, primipaternity and obesity. Therefore, it needs appropriate prevention methods to avoid the emergence of pregnancy problems and their complications include recognizing the signs and symptoms of preeclampsia, be aware of risk factors for the causes of preeclampsia, routine antenatal care, and adopting a healthy lifestyle.

**Keywords:** *preeclampsia, pregnant women, characteristics*

### INTRODUCTION

The death of pregnant women is one indicator of world health, including in Indonesia. The Maternal Mortality Rate (MMR) in Indonesia in 2014 reached 214 per 100,000 live births<sup>1</sup>. This figure has increased compared to the MMR in 2015 which was 305 per 100,000 live births<sup>1</sup>. East Java, including the province, contributed to the increase in the number of events. In 2016, MMR East Java Province reached 91.00 per 100,000 live births<sup>2</sup>. This figure has increased compared to 2015 which reached 89.6 per 100,000 live births. The highest cause of maternal mortality in 2016 was preeclampsia/eclampsia which amounted to 30.90% or as many as 165 people. While the smallest cause is infection at 4.87% or as many as 26 people<sup>2</sup>. Based on data from Ministry of Health Republic of Indonesia, preeclampsia is a major cause of death for pregnant women, followed by bleeding and other causes<sup>2</sup>.

Preeclampsia is a disorder that occurs during pregnancy.

Preeclampsia is usually defined as an increase in blood pressure and proteinuria that occurs after 20 weeks gestation<sup>3</sup>. According to research by Sutrimah, Mifbakhudin, and Wahyuni, preeclampsia can affect the body's system, changes that occur in preeclampsia appear to be caused by a complex combination between abnormal genetics, immunological factors and placental factors<sup>4</sup>. Signs of early preeclampsia are blood pressure 140/90-160/110 mmHg, proteinuria > 300 mg/24 hours and edema<sup>4</sup>.

From the results of previous studies that have been conducted in Tjitrowardoyo Purworejo Hospital, the results of the data on the occurrence of maternal deaths in 2016 ranged from 1,862 people from all births<sup>5</sup>. Among them were 181 cases of preeclampsia (9.72%), 8 pre-natal bleeding (0.43%), 30 post-partum bleeding (1.61%), 9 people eclampsia (0.48%), 2 infections people (0.11%), and because of others 1,632 people (87.65%)<sup>5</sup>. In addition,

from the results of studies that have been conducted at the Regional Public Hospital/*Rumah Sakit Umum Daerah* (RSUD) Dr. Soetomo Surabaya in 2016, obtained as many as 394 samples taken pregnant women with preeclampsia, so it requires special attention in maintaining the condition of her pregnancy<sup>6</sup>.

Based on the results of the study above, the authors are interested in conducting research on the characteristics of pregnant women with preeclampsia in RSUD Dr. Mohammad Soewandhie in 2017. This research is expected to be able to reveal the triggers of preeclampsia in pregnant women in RSUD Dr. Mohammad Soewandhie was included in East Java Province, so that in the following year the death of pregnant women with preeclampsia in East Java Province did not experience repeated increases.

## RESEARCH METHODS

The research method is descriptive retrospective study. The population in this study were all pregnant women with preeclampsia who were recorded in the medical record

form in the Obstetrics and Gynecology section at RSUD Dr. Mohammad Soewandhie from January 1 to December 31, 2017. The sampling technique in this study was carried out by means of total sampling. The sample in this study were pregnant women with a diagnosis of preeclampsia of 100 samples that met the inclusion criteria. The inclusion criteria in this study were pregnant women with gestational age reaching 20 weeks or more and having complete medical record records, including maternal age, gestational age, number of pregnancy pregnancies (parity), body weight, height, blood pressure. Data processing is done by using editing, coding, and tabulating techniques. Descriptive data analysis using distribution formula which is presented in the form of a frequency distribution table.

## RESULTS

The data results included age, parity status, Body Mass Index (BMI), history of hypertension, history of hypertension in the family and the patient recent education. The following table of research results data.

**Table 1. Distribution of preeclampsia samples based on age**

Age	N (person)	Percentage
< 20 years old	2	2%
20–35 years old	43	43%
> 35 years old	55	55%
Total	100	100%

### Characteristics of Age

Based on Table 1 above, it shows that the age of the mother with the highest incidence of preeclampsia is at the age of > 35 years (55%), then the age of 20-35 years (43%) and the lowest at < 20 years (2%).

### Characteristics of Parity Status

Based on Table 2 below, it shows that maternal parity status with the highest incidence of preeclampsia is in primipaternity (65%), then grandmultipaternity (22%) and lowest in multipaternity (13%).

**Table 2. Distribution of preeclampsia samples based on parity status**

Parity	N (person)	Percentage
< 1 (Primipaternity)	65	65%
2-3 (Multipaternity)	13	13%
> 4 (Grandmultipaternity)	22	22%
Total	100	100%

### Characteristics of Body Mass Index (BMI)

Based on Table 3 below, it shows that the body mass index of mothers with the highest incidence of preeclampsia is obesity (63%), then overweight (31%), then normal (6%), and lowest underweight (0%).

### Characteristics of Hypertension History

Based on Table 4 below, shows that the history of maternal hypertension with the highest incidence of preeclampsia is in patients without a history of hypertension (67%) and the lowest in patients with a history of hypertension (33%).

**Table 3. Distribution of preeclampsia samples based on BMI**

Body Mass Index (BMI)	N (person)	Percentage
≤ 18,4 (underweight)	0	0%
18,5-24,9 (normal)	6	6%
25 – 29,9 (overweight)	31	31%
≥ 30 (obesity)	63	63%
Total	100	100%

**Table 4. Distribution of preeclampsia samples based on hypertension history**

Hypertension History	N (person)	Percentage
Have History	33	33%
No History	67	67%
Total	100	100%

### Characteristics of Hypertension History in Families

Based on Table 5 below, shows that the history of hypertension in families with the highest incidence of preeclampsia is in patients without a family history (78%) and lowest in patients with a family history (22%).

**Table 5. Distribution of preeclampsia samples based on hypertension history in families**

Hypertension History in Families	N (person)	Percentage
Have History	22	22%
No History	78	78%
Total	100	100%

### Characteristics of Education Level

Based on Table 6 below, it shows that the education level of mothers with the highest incidence of preeclampsia is at the high school level (48%), then at the elementary level (27%), then junior high school level (21%), and lowest at the college level (4%).

**Table 6. Distribution of preeclampsia samples based on education level**

Education Level	N (person)	Percentage
Primary School	27	27%
Junior High School	21	21%
Senior High School	48	48%
College	4	4%
Total	100	100%

## DISCUSSION

### Age of Pregnant

The safest mother's age for pregnancy and childbirth is the age of 20-35 years because the female reproductive organs are mature and ready to accept physiological changes that occur during pregnancy<sup>7</sup>. Pregnancy risk increases at age < 20 years due to immaturity of female reproductive organs to maintain pregnancy, while age > 35 years is associated with the occurrence of endothelial wall degeneration which can cause hypertension in pregnancy<sup>7</sup>. In this study the highest percentage of the incidence of preeclampsia at the age of > 35 years, so that age is one of the risk factors that should be watched out for the occurrence of preeclampsia.

### Parity

Parity or number of children born is one of the factors that influence the occurrence of preeclampsia. Safe parity for delivery is 2-3. Parity > 1 and < 3 have a high risk of maternal mortality<sup>8</sup>. This is presumably due to the immunological mechanism, in primipara the formation of blocking antibodies to placental antigens is not perfect<sup>9</sup>. Imperfect placental antigen formation results in an unfavorable immune response to placental histoincompatibility<sup>9</sup>. In this study there was a significant relationship between parity risk and an increased incidence of preeclampsia.

### BMI

A person's body mass index influences fat peroxide levels in the body, if fat peroxide increases it can damage endothelial cell membranes<sup>8</sup>. In this study, there was a significant relationship between the increase in body mass index to the incidence of preeclampsia. Obesity has been implicated as a risk factor for both maternal and foetal complications<sup>13</sup>.

### Hypertension History

A history of hypertension that has been suffered by pregnant women increases the risk of the occurrence of preeclampsia. Pregnant women with hypertension will

experience vascular constriction because of the adaptation process that causes obstruction of blood flow and the occurrence of arteriolar hypertension<sup>10</sup>. However, in this study there was no significant relationship between the history of hypertension and the incidence of preeclampsia.

### Hypertension History in Families

History of family hypertension can increase the risk of preeclampsia, this is associated with the presence of genetic factors, namely the occurrence of increased intracellular sodium levels and a low ratio between sodium and potassium<sup>11</sup>. However, in this study there was no significant association between the history of hypertension in the family and the incidence of preeclampsia.

### Education Levels

The incidence of preeclampsia in developing countries is associated with low levels of education. The level of education affects one's insight into knowledge, including in the health sector<sup>12</sup>. However, the data from this study prove that the education level of preeclampsia sufferers at the senior high school level is higher than in elementary and junior high school levels, so education factors are not a major factor in preeclampsia cases.

### Prevention of Preeclampsia

The following stages need to be done as an effort to prevent preeclampsia:

- Recognize the signs and symptoms of preeclampsia. The following are the initial signs and symptoms of preeclampsia, swelling of some limbs, shortness of breath due to fluid in the lungs, severe headaches, nausea and vomiting, visual disturbances. To anticipate the symptoms increasing to a more severe stage, a "Senansia" movement (Lightweight Preeclampsia) can be performed which consists of lying down in a comfortable place then lifting the foot with a support object as high as 45°, deep breathing 3 times and holding the breath for 5 seconds, slow walk 10 steps

followed by slow breathing and hand movements following footsteps, avoid going straight from the place after waking up, eating small portions to avoid nausea and when shortness of breath occurs immediately sits forward leaning slightly forward. This movement can be disseminated to health services and online media;

- (2) Beware and avoid risk factors for the causes of preeclampsia: (a) Primigravida, primipaternity; (b) Hyperplacentosis, for example: hydatidiform mole, multiple pregnancy, diabetes mellitus, hidrops fetalis, large babies; (c) Extreme age; (d) Family history of preeclampsia/eclampsia; (e) Kidney and hypertensive diseases that already exist before pregnancy; (f) Obesity;
- (3) Routine antenatal care to the nearest health service, including screening tests to detect risk factors, Rool Over Test (ROT), which is a measurement of blood pressure at different positions, ultrasound of pregnancy. Then these patients can be categorized into groups of patients at risk and not at risk of preeclampsia;
- (4) Do a healthy lifestyle such as diligent exercise and consume lots of foods high in iron, folic acid and antioxidants. Can be supplemented with vitamins C, E, calcium, aspirin and acetyl salicylate.

## CONCLUSION

Thus it can be concluded that: (1) Age of pregnant > 35 years increases the risk of preeclampsia; (2) Primiparous parity (< 1 child) has a higher risk than multiparous in the event of preeclampsia; (3) Increasing the Body Mass Index (BMI) increases the risk of preeclampsia; (4) History of hypertension in patients and in families does not have a significant relationship to the incidence of preeclampsia; (5) The level of education of patients does not have a significant relationship to the incidence of preeclampsia.

## Acknowledgment

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## Ethical Approval and Informed Consent

This research has been approved by Health Research Ethics Committee of RSUD Dr. Mohammad Soewandhie and Faculty of Medicine, Ciputra University Surabaya.

## Funding

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## Availability of Data and Material

Data and material can be accessed via corresponding author.

## Conflict of Interest

None.

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