

Literature Review: Risk Factors And Early Detection Of Preeclamsia In Women Pregnant

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Background: The high maternal mortality of 2015 is a big problem in Indonesia, which is 305 per 100,000 live births (Indonesian Population Profile Supas Result, 2015). The maternal mortality of 2010-2012 is due to an increase in preeclampsia, eclampsia and other factors, such as social problems, cultures, less education, to economic issues. **Methods:** The design of the research used is the study of libraries, articles gathered using search engines such as EBSCO, ScienceDirect, ProQuest and Elsevier. The article used in the study was published in 2010-2019. **Result:** Based on the article collected results that there are several factors related to the preeclampsia in pregnancy and the intervention phase should be done early. These factors are the age of mothers during pregnancy, praitas, double pregnancy, the history of hypertension in the family, preeclampsia history during previous pregnancies and obesity. The cause of the mother's death is actually preventable with an adequate ANC pregnancy test and early detection of the risk of pregnant women. **Conclusion:** The introduction of a complementary obstetrician is given to mothers at risk of preeclampsia during pregnancy. Further studies are advised to consider the effects on various variables by considering the random effects and changes in the model with the addition of contextual effects in the analysis.

Keywords:

Risk Factors Preeclampsia
Intervention Preeclampsia
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I. Introduction

Every pregnancy can pose a risk of maternal death. Adequate monitoring and health care during pregnancy to the puerperium is essential for the survival of both mother and baby (Ministry of Health, 2009) (Law Number 36 of 2009). The increasing threat to mothers and babies in increasing morbidity and mortality in infants is due to preeclampsia. Factors that contribute to infant mortality of mothers with preeclampsia are the age of the mother, gestational age and method of delivery (Oliver, 2019).

The high MMR in 2015 is a big problem in Indonesia, namely 305 per 100,000 live births (SUPAS, 2015). Mother's death ("World Health Organizations," 2014), is death during pregnancy or within a period of 42 days after the end of pregnancy, which occurs due to things related to pregnancy and is aggravated by pregnancy and management in pregnancy.

MMR in East Java is currently recorded at 97.39 / 100,000 KH. This figure is lower than the provincial estimate target of 102 / 100,000 KH. The regions that contributed the most to MMR were Surabaya, Kediri, Jombang, and Situbondo. Most of the maternal deaths were due to late delivery to the referral center (Health, 2014). The factors that cause maternal death are social, cultural, lack of education, to economic problems. However, the most common causes of maternal mortality are preeclampsia (high blood pressure during childbirth) and bleeding due to less rapid handling (Indriani, 2017).



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Preeclampsia and eclampsia are the main causes of perinatal morbidity and mortality in Indonesia. Preeclampsia is a disease with different incidence in each country. The incidence is higher in developing countries than in developed countries. This is because in developed countries prenatal care is better. The cause of preeclampsia cannot be determined, but this condition can be influenced by parity, race, genetic and environmental factors. Pregnancy with preeclampsia is more common in primigravidas, whereas in multigravidas it is associated with chronic hypertension, diabetes mellitus and kidney disease.(Djannah & Arianti, 2015).

The incidence of preeclampsia is about 5-8% of all pregnancies, the incidence of preeclampsia in second pregnancies is less than 1% of pregnant women with normal blood pressure during the first pregnancy (Moghadam, Khosavri, & Sayehmiri, 2017). The number of infant mortality cases decreased from 33,278 in 2015 to 32,007 in 2016 and in 2017 there were 10,294 cases. Similarly, the maternal mortality rate fell from 4,999 in 2015 to 4,912 in 2016 and in 2017 there were 1,712 cases. Despite experiencing a decline, the figure is still high(Chappell et al., 2018).

The biggest causes of maternal mortality in Indonesia are dominated by bleeding and preeclampsia. Bleeding factors usually occur because of the delay in the referral system to health care providers. Meanwhile, the preeclampsia factor is possible because of the low level of education and awareness of the importance of health in pregnant women(Saleem & Bobak, 2005).

To reduce the incidence of hypertension in pregnancy, cross-sectoral collaboration with the government, health offices, community health centers, referral hospitals, village midwives is needed to facilitate health personnel and facilities so that the community can reach access to health services. (Bloom, 1908) (Lawrence Green, 1993). In addition, good motivation, participation and communication efforts are also needed so that people are aware, willing and able to take advantage of health services and facilities that focus on the health of pregnant women, by means of health promotion strategies through promotive efforts to increase and prevent severe preeclampsia in pregnant women. Based on the above background, the authors are interested in discussing "Literature Review: Risk Factors and Early Detection of Preeclampsia in Pregnant Women".

II. The Proposed Method

Preeclampsia is one of the most challenging gestational diseases, with unclear etiology, no specific marker for prediction, and no appropriate treatment other than referral. Many of the risk factors that have been identified with diagnostic and management tools have improved over the years. However, preeclampsia is still one of the leading causes of maternal morbidity and mortality worldwide(Costa, 2015).

The physical and psychological stress experienced by patients with preeclampsia can cause serious problems, ranging from discomfort to hemodynamic problems. Physical stress impairs the patient's physical and physiological endurance(Vianna, 2011). Meanwhile, psychological stress causes psychological distress to be responded to by nerves and endocrine, which can have negative effects(Poel, 2009).

Psychological distress triggers the hypothalamus to secrete Corticotropin Releasing Factor (CRF), which CRF induces sympathetic nerves that empties into the adrenal medulla, in which case chromafin cells secrete catecholamines. (Ziganshina, 2018). Furthermore, catecholamines are captured by α and β adrenoceptors in the heart and blood vessels, causing an increase in ventricular contraction and heart rate, as well as vasoconstriction of blood vessels.

In pregnant women with preeclampsia experiencing excessive maternal systemic inflammatory response to pregnancy it has been suggested to be responsible for endothelial dysfunction leading to cellular activation or damage. Endothelial dysfunction is considered central in the pathogenesis of preeclampsia. The inflammatory process is the adhesion of leukocytes to endothelial cells followed by the transmigration of these cells into the perivascular tissue. Endothelial adhesion leukocytes are strongly influenced by the interaction of adhesion molecules and their ligands on these cells. A number of molecules that mediate leukocyte-endothelial adhesion have been identified; these include vascular cellular adhesion molecule-1 (VCAM-1), intracellular adhesion molecule-1 (ICAM-1) and E-selectin. In vitro studies have shown that the expression of these molecules on the endothelial surface is tightly regulated, and that this regulation may have an important role in the restoring properties of leukocytes during the inflammatory response. The soluble form of these molecules can be released into the circulation, and increased serum levels of these molecules can indicate endothelial dysfunction. (Williamson et al., 2018).

Interestingly, several studies have reported that the level of this adhesion molecule appears to be increased in the serum of pregnant women with preeclampsia. Indeed, abnormal levels of these adhesion molecules can be considered a marker of preeclampsia. However, reports do not always agree. The serum levels of VCAM-1 and E-selectin did not differ significantly between normal and preeclamptic pregnancies. The ICAM-1 serum level did not differ between normal pregnancy and preeclampsia (Kim, 2004). The results showed serum concentrations of dissolved adhesion molecules VCAM-1, ICAM-1 and E-selectin in normal pregnancy and preeclampsia. All three adhesion molecules are increased in severe preeclampsia compared to normal pregnancy, and sVCAM-1 among them may be useful in predicting preeclampsia severity. (Kim, 2004).

III. Method

The method used in writing this article is a literature review, which is a literature search, both international and national, which is conducted using the EBSCO database, Sciencedirect, Proquest and Elsevier. (Cresswell, 2010). In the early stages of searching for journal articles, 41,435 articles from 2010-2019 were obtained using the keywords "preeclampsia", "preeclampsia in pregnant woman", "risk factors for preeclampsia" and "early detection for preeclampsia". The number of articles obtained has not been identified and explored their relevance to the compiled articles. Of these, only 115 articles were considered relevant. From the relevant articles, it was found 17 articles that had inclusion criteria from researchers and were qualified.

IV. Results and Discussion

RESULTS

According to WHO, ANC for early detection of high risk of pregnancy and childbirth can reduce AKI and can function to monitor the state of the fetus (Prasetyo et al., 2018). Pregnancy examination in ANC behavior is based on theoretically established criteria once in the first trimester, once in the second trimester and twice in the third trimester (Rahayu, 2017). ANC visits that are not yet optimal result in risks and complications of pregnancy that are not detected early so that antenatal visits are needed. Antenatal visit of at least four times is an effort to reduce complications related to pregnancy, childbirth, and the postpartum period for mothers and newborns. (Lasiaprillianty, 2017).

The low K4 coverage illustrates that there are still many pregnant women who have made the first visit to antenatal care, but did not continue until the fourth visit in the third trimester, so that their pregnancies were separated from the monitoring of health workers. This condition opens up opportunities for death to mothers giving birth and the babies they are carrying. This condition must be anticipated by increasing outreach to the community and conducting intensive communication and education to pregnant women and their families so that their pregnancy checks are in accordance with standards. ("East Java Provincial Health Office," 2018).

Predisposing factors that influence the incidence of preeclampsia include ANC services (Butler et al., 2014). A case-control study in New York showing the risk of severe preeclampsia increased by 2.14 in the absence of antenatal care (OR = 2.14; 95% CI = 1.34-3.43). Based on the analysis of the Chi Square test at the 95% confidence level, found the p value = 0.004 ($p < 0.05$) with OR 9.6. Based on the results of the research above, it is concluded that there is a relationship between ANC services and the incidence of preeclampsia in the delivery room at RSUD Ulin Banjarmasin for the period March-May 2014 (Isnanda, Noor, & Musafaah, 2014).

Pregnancy examination is a process of examinations carried out from the first period of pregnancy to the time of delivery. This examination is carried out to supervise and monitor the health of the mother and baby so that everything runs smoothly as expected. Based on the results of statistical tests, the OR value was 2.72 with a confidence level (CI) of 95%, namely 1.39 to 5.33. Because the lower limit and upper limit values do not include the value of 1 and are supported by a p value of 0.03 ($p < 0.05$), it is statistically significant so that this study shows a significant relationship between pregnancy examinations and the incidence of preeclampsia. (Fang, Dawson, Lohsoonthorn, & Williams, 2009).

Based on the results of the articles collected by the author's analysis, it was found that the support given to pregnant women with a diagnosis of preeclampsia needs to be increased, not only support in antenatal care, but also support in various pregnancy care. One thing that can be done is midwifery and nursing care (Diaz, After all, & Cnaltingius, 2017).

DISCUSSION

Pregnancy is a unique situation associated with a wide range of physiological and psychological changes. Changes in appearance prevent many pregnant women from having a positive self-image. Apart from changes in appearance, most pregnant women also have difficulty communicating with other people. In other words, women's physical and interpersonal self-deterioration during pregnancy. These problems cause psychological harm to pregnant women, especially during their first pregnancy. Psychological damage, in turn, is associated with different complications such as a high risk for prematurity, preterm birth, and cardiovascular disease. (Mohammadpour, 2016).

Maternal health will affect the health of the fetus, therefore it is very important for early detection of disorders or diseases in the mother so that they can be corrected immediately and can reduce the risk to the fetus. For example anemia in mothers (women) is common in Indonesia. If this anemia is severe or not treated properly, the growth of the fetus can be disturbed, and the health of the mother is also affected. Existing abnormalities in the mother require consultation with a doctor. This consultation would not be possible if the examining midwife did not know that the patient she was treating was at risk. Periodic training or continuing education is needed to maintain and improve the competence of every health worker.

Maternal Age at Pregnancy

Age 20-30 years the safest period for pregnancy or childbirth, will occur in developing countries about 10% -20% of babies born to teenage mothers who are slightly larger than children. Whereas from a study it was found that two years after the first menstruation, a woman may still achieve pelvic growth between 2-7% and a height of 1%. (Moerman, 1982). The impact of underage, from the results of research in Nigeria, women aged 15 years have a maternal mortality rate 7 times greater than women aged 20-24 years (Schneider et al., 2016). The age factor affects the occurrence of preeclampsia or eclampsia. Age of adolescent women in first pregnancy or nulliparous teens (younger than 20 years). Studies at Neutra Hospital in Colombia, Porapakphan in Bangkok, Efiang in Lagos and Wadhawan, and others in Zambia, tend to show that the incidence of preeclampsia is quite high in the teens, the problem is that they do not want to do antenatal examinations.

Level of education

The theory of education says that education is an activity or effort to improve personality, so that the process of changing behavior leads to maturity and the improvement of human life. The more education a person gets, the more mature they are, they can easily receive and understand positive information (Jannah, 2012). In relation to health problems, from the book Safe Motherhood states that women who have higher education tend to pay more attention to their health.

Socio-Economic Factors

It is often stated that socio-economic life is related to the increasing rate of preeclampsia. Some experts conclude that women with better socioeconomic conditions are less likely to suffer from preeclampsia, even after taking into account racial factors (Syafiq, 2007). Regardless of this, preeclampsia suffered by women from well-to-do families can still be severe and life-threatening, as is the case with eclampsia suffered by teenage women in slum areas.

Profession

A person's work activities can affect the work of the muscles and blood circulation. Likewise if it occurs in a pregnant woman, where the blood circulation in the body can change with increasing gestational age due to pressure from the enlargement of the uterus. (Ministry of Public Works, 2006). Increasing gestational age will have an impact on the consequences of increasing the work of the heart in meeting the needs during the pregnancy process.

Parity

Of the incidence of 80% of all cases of hypertension in pregnancy, 3-8% of patients are mainly primigravidas, in the second trimester of pregnancy. (Desfiyanti, 2016). The statistical records show that from all world incidence, from 5% -8% of preeclampsia of all pregnancies, there are 12% more due to primigravida. The factors that affect pre-eclampsia are the frequency of primigravidas is higher when compared to multigravidas, especially young primigravidas. (Pratiwi, 2015). Repeated labor carries many risks to pregnancy, it has been proven that second and third deliveries are the safest deliveries. In The New England Journal of Medicine, it was noted that in the first pregnancy, the risk of preeclampsia was 3.9%, the second pregnancy was 1.7%, and the third pregnancy was 1.8%.

Multiple Pregnancy

Preeclampsia and eclampsia were three times more common in multiple pregnancies than 105 cases of twins resulted in 28.6% pre-eclampsia and one maternal death due to eclampsia. From the results in singleton pregnancies, and as a contributing factor is uterine dyslensia. The research stated that 8 (4%) cases of severe preeclampsia had more than one fetus, while in the control group, 2 (1.2%) cases had more than one fetus. (HH, JM, & KG, 1995).

Family History of Hypertension

The results showed that there were 83 (50.9%) cases of preeclampsia who had a history of eclampsia, while in the control group there were 12 (7.3%) who had a history of severe preeclampsia. Racial and genetic factors are important because they support the incidence of underlying chronic hypertension. We analyzed the pregnancies of 5,622 nulliparous who gave birth at Parkland Hospital in 1986, and 18% of white women, 20% of Hispanic women, and 22% of black women had hypertension that aggravated the pregnancy.(Puspita, 2016). The incidence of hypertension in pregnancy for multiparous was 6.2% in whites, 6.6% in Hispanics, and 8.5% in blacks, indicating that black women were more likely to develop underlying hypertensive disease. More than half of the multiparous with hypertension also developed proteinuria and were superimposed from preeclampsia(Fang et al., 2009). The predisposition to preeclampsia-eclampsia is inherited.

History of Preeclampsia During Previous Pregnancy

One of the predisposing factors for pre-eclampsia or eclampsia is a history of chronic hypertension, or previous hypertensive vascular disease, or essential hypertension. The results showed that there were 83 (50.9%) cases of preeclampsia who had a history of preeclampsia, while in the control group there were 12 (7.3%) who had a history of severe preeclampsia. (Chappell et al., 2018).

Obesity

Obesity in addition to causing high cholesterol in the blood also causes the heart to work harder, because the amount of different blood in the body is around 15% of body weight, the more fat a person is, the more blood is in the body, the heavier the pumping function. heart so that it can contribute to preeclampsia (Widiawati, 2019).

The quality of antenatal care provided to pregnant women is weighing and measuring height, measuring blood pressure, and upper arm circumference (LiLA). In addition, uterine fundal height measurements are also carried out, calculate the fetal heart rate (FHR), determine the fetal presentation to estimate gestational age and fetal health. To support the health of the mother and the fetus, Tetanus Toxoid (TT) immunization is also given, provision of additional blood tablets or iron (Fe) tablets, as well as laboratory tests (routine and special), case management, and effective discussion.("Ministry of Health of the Republic of Indonesia," 2015)

Screening is an activity for pro-active early recognition of pregnant women to find problems or risk factors, namely early detection of Ibu Resti (Rochjati P, 2008). Risk is a statistical measure of the chance or likelihood of an unwanted emergency, for example, the occurrence of death, illness or disability in a mother and her baby.(Report, 2003).

The cause of maternal death can actually be prevented by adequate ANC antenatal care and early detection of the risks of pregnant women. With ANC, some information about pregnancy that is not yet known by the mother can be detected and with early detection all risk factors that can cause complications can be identified and prevented. If there is one of the high risk factors for pregnant women in pregnancy, precautions can be taken as early as possible so that the risk of death can be reduced with prompt and appropriate treatment.(Pal et al., 2017).

To reduce the incidence of hypertension in pregnancy, cross-sectoral collaboration with the government, health offices, health centers, referral hospitals, village midwives is needed to facilitate health personnel and facilities so that people can access health service access. In addition, good motivation, participation and communication are also needed, so that people are aware, willing and able to take advantage of health services and facilities that focus on the health

of pregnant women, by means of health promotion strategies through promoting early detection of preeclampsia.

V. Conclusion

Preeclampsia in pregnancy can cause anxiety and fear to increase during pregnancy. Mothers who experience anxiety and stress can cause their blood pressure to rise, thus endangering the condition of both mother and baby during pregnancy, even before delivery. With ANC, some information about pregnancy that is not yet known by the mother can be detected and with early detection all risk factors that can cause complications can be identified and prevented.

It is important to provide complementary midwifery care to mothers who are at risk of developing preeclampsia during pregnancy. Further studies are suggested to consider the effects on various variables taking into account random effects and changes in the model with the addition of contextual effects in the analysis.

Early detection of risk factors for complications is an activity to find pregnant women with risk factors and complications. Every pregnancy is something that is normal for a woman to experience in the reproductive process but sometimes complications occur. For this reason, activities and the community, especially pregnant women, so that adequate handling can be carried out as early as possible. This is the key to success in reducing MMR and IMR.

Further studies are suggested to consider the effects on various variables taking into account random effects and model changes with the addition of contextual effects in the analysis. For example, the addition of environmental and socio-cultural factors with various types of Indonesian backgrounds is related to preeclampsia in pregnancy.

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