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Early and Late Onset Preeclamsia: What did really Matter?

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Summary

Preeclampsia is main cause of morbidity and mortality both mother and fetus. Preeclampsia occurs in 2- 10% of pregnancy and that was no changed during the last century. Endothelial dysfunction was believed as cause of preeclampsia incidence until now their mechanism is unknown. Preeclampsia was divided in two kind of preeclampsia, early onset preeclampsia is occur at less <34 weeks of gestation age and late onset preeclampsia is occur at >34 weeks of gestation age. Early and late onset preeclampsia have different etiologic and should be considered as different diseases then there are difference in the term of marker, clinical manifestation, maternal and perinatal outcome, prognosis, and complication. Early onset preeclampsia has a much worse maternal and fetal outcome than late onset preeclampsia

Text

Preeclampsia is a pregnancy associated with hypertensive disease that occurs after 20 weeks' gestation. Preeclampsia is still a major contributor to maternal and fetal morbidity and mortality [1]. The incidence of preeclampsia is 2 to 10% of all pregnancies in the world. According to WHO the incidence is 7 times greater in developing countries compared to developed countries [2]. Preeclampsia cases in Indonesia causing 30-40% of maternal death and 30-50% of perinatal death. In Dr. Moewardi General Hospital Surakarta Indonesia maternal mortality which were caused by preeclampsia were 19 ot of 30 maternal mortality cases and increasing to 12 out of 21 in 2013 [3]. Preeclampsia is distinguished into two: early onset where preeclampsia occurs at <34 weeks' gestational age and late onset occurring at >34 weeks of gestation. The early-onset concept of preeclampsia and late-onset of preeclampsia is more modern, and it is widely accepted that these two entities have different etiologies and should be regarded as different forms of disease [4].

The difference between early and late onset preeclampsia

Early onset and late onset preeclampia have different implications for fetuses and neonates, with perinatal mortality rising about 10-fold higher on early onset, and doubling in late-onset. Early onset preeclampsia is a severe pregnancy complication characterized by elevated blood pressure, metabolic and inflammatory changes leading to generalized endothelial dysfunction and end-organ damage due to vascular disorders. Early onset preeclampsia is a potentially life-threatening disease for both mother and baby [5]. Early onset preeclampsia is the most severe clinical variant of disease occurring 5-20% of all cases of preeclampsia and is associated with impaired fetal growth, fetal pathology and uterine blood circulation, small size of the placenta, preterm delivery, neonatal morbidity and mortality. Early onset preeclampsia developments are associated with impaired trophoblast invasion, complete transformation of the uterine spiral artery, immune maladaptation and increased markers of endothelial dysfunction. Preeclampsia late onset is about 75-80% of all cases of preeclampsia; Which are associated with maternal morbidity (metabolic syndrome, impaired glucose tolerance, obesity, dyslipidemia, chronic hypertension), normal birth weight and normal placental volume [6].

Risk Factors

There are differences in risk factors between early-onset and late-onset preeclampsia, a history of chronic hypertension and family history of hypertension. The history of chronic hypertension was significantly associated with an increased risk of early onset onset of preeclampsia, whereas a history of chronic family hypertension was significantly associated with an increased risk of late-onset preeclampsia alone [7]. Early onset preeclampsia predictors are African race, chronic hypertension, previous preeclampsia history and ovulation drug use. Predictors

of late-onset preeclampsia and gestational hypertension increase with maternal age and BMI, and family history or preeclampsia history. The rate of early detection of preeclampsia, late-onset preeclampsia and gestational hypertension in screening with maternal factors was only 37.0; 28.9 and 20.7%, respectively, to a false positive rate of 5%. History of preeclampsia or eclampsia in previous pregnancies, passive smoking exposure, inadequate antenatal supervision, family hypertension history in one or more first-degree families, living in a shared family, overweight and lower socioeconomic status were associated with increased risk early onset of preeclampsia and eclampsia [8]. Obesity and obesity increase the risk of preeclampsia, which is explained by elevated levels of fatty acid triglycerides and free fatty acids. These lipid changes may produce a major factor causing endothelial cell dysfunction in preeclampsia with increased circulating levels of lipid peroxide oxidative stress. This can cause endothelial cell damage [9]. Maternal weight <0.2kg per week is a significant protective factor for the onset of preeclampsia. Pre pregnancy BMI <20kg/m^2 is a significant protective factor for late onset preeclampsia. The history of chronic hypertension is a significant risk factor for early onset preeclampsia. A family history of chronic hypertension is a significant risk factor for late onset preeclampsia. Chronic hypertension can lead to end-organ damage and complications of blood vessels. This may be the reason why chronic hypertension is associated with early-onset preeclampsia; A family history of chronic hypertension is associated with late onset preeclampsia. This may be explained by genetic predisposition [7].

Markers

Markers for predicting preeclampsia includes: Angiogenic Factors such as Vascular Endothelial Growth Factor (VEGF), Placental Growth Factor (PlGF), Fms-like Tyrosine Kinase (flt) -1 and Soluble Endoglin [10]; P-Selectin [11]; Cells Free fetal DNA [12]; ADAM12 (Disintegrin and Metalloprotease 12) [13];Placental protein 13 [14; Pentraxin 3 [15]; Pregnancy-Associated Plasma Protein A [16]; and Doppler Sonography of Uterine Artery [17].

Maternal and Perinatal Outcome

The ratio of maternal and perinatal mortality of near missed cases are 0.96% and 29.06%. The ratio of cases in which maternal life at risk (maternal and maternal mortality near missed) is 30%. Premature birth, intrauterine death between 20-28 weeks, intrauterine death between 28-37 weeks, first trimester abortion aresignificantly higher in women with early onset preeclampsia compared to late onset. The incidence of disease histories other than chronic hypertension (especially diabetes mellitus), the history of preterm delivery is significantly higher in women with late-onset preeclampsia. The mean gestational age at delivery and birth weight are significantly lower in early-onset preeclampsia. The incidence of stillbirth, early neonatalmortality and late neonatal mortality, cases in which maternal life at risk are significantly higher in women with early onset preeclampsia [9].

Prognosis

Stillbirth, early and late neonatal mortality, cases in which maternal life at risk were significantly higher in early-onset preeclampsia. Women with early onset preeclampsia have higher maternal mortality rates than late onset [9] Early onset preeclampsia also needs longer duration of treatment. Babies born from early-onset preeclampsia mothers particularly are troublesome. Infants commonly suffer asphyxia and lower birth weight, and those are rarely happened in late-onset preeclampsia. This implicates in lower survival rate of baby born from early onset preeclampsia. So it can be concluded that perinatal mortality and morbidity in early onset are way worse [18].

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