Difference of concentration of placental soluble fms-like tyrosine kinase-1 (sFlt-1), placental growth factor (PIGF), and sFlt-1/PIGF ratio in severe preeclampsia and normal pregnancy

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Abstract

Background: Placental soluble fms-like tyrosine kinase-1 (sFlt-1) which is an antagonist of vascular endothelial growth factor and placental growth factor (PIGF), is considered as one of etiology factors cause endothelial damage in preeclampsia due to increase of sFlt-1 level that change vascular endothelial integrity. This study aims to analyze the difference of sFlt-1 and PIGF concentration in severe preeclampsia and normal pregnancy, and the correlation between both in occurrence of severe preeclampsia.

Method: This is case control study involving 18 subjects with severe preeclampsia and 19 subjects with normal pregnancy as controls who met inclusion and exclusion criteria. Concentration of sFlt-1 and PIGF are measured with ELISA. Statistical analysis is performed with Chi square test, Fisher’s exact test, T test, Mann–Whitney test, and Spearman's rank correlation test.

Results: This study results in no significant difference in characteristics of gestational age, and parity in both study groups. Median concentration of sFlt-1 in severe preeclampsia is higher (20,524.75 pg/mL) compared with normal pregnancy (6820.4 pg/mL). Concentration of PIGF is lower in severe preeclampsia (47 pg/mL) compared with normal pregnancy (337 pg/mL). sFlt-1 concentration is higher in severe preeclampsia compared to normal pregnancy. PIGF concentration is lower in severe preeclampsia compared to normal pregnancy. Ratio of sFlt-1 and PIGF concentration is significantly correlated in both severe preeclampsia and normal pregnancy.

Conclusions: There is a significant negative correlation between the concentration of sFlt-1 and PIGF in normal pregnancy.

Keywords: Normal pregnancy, Severe preeclampsia, PIGF, sFlt-1

Background

Gestational hypertension is one of the most common complications in pregnancy, labor, or postpartum which increases maternal and perinatal morbidity and mortality. Severe preeclampsia is a pregnancy-specific syndrome characterized by systolic blood pressure of ≥160 mmHg and diastolic blood pressure of ≥110 mmHg, with qualitative proteinuria of ≥+1 or 0.3 g/24 h. [1, 2] World Health Organization (WHO) in 2006, reported that almost 16% of 3201 mortality caused by pregnancy was contributed by gestational hypertension [3]. According to data from National Center For Health Statistics in USA, gestational hypertension occurs in 150,000 women...