The effect of lectin-like oxidized low density lipoprotein receptor monoclonal antibody (LOX-1 MAb) on the expression of eNOS in preeclamptic HUVECs model

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Introduction

Preeclampsia is a major cause of fetal and maternal morbidity and mortality and it still occurs in 7–10% of all pregnancies worldwide. The pathophysiology remains unclear and so it was named "a disease of theories". Clinical and biochemical evidences assumed that disruption of normal endothelial cells may be the primary cause in the pathogenesis of preeclampsia. Factors that cause endothelial dysfunction are not certainly known, but the evidence suggests that factors related to the placenta. In a previous study conducted, HUVECs were found to significantly increase the uptaking of Ox-LDL by endothelial cells in response to the exposure to preeclampsia plasma when compared with non-pregnant women plasma and plasma of pregnant women. Ox-LDL binds to LOX-1 in vascular cells, including endothelial cells and smooth muscle cells, and is thought to cause endothelial dysfunction in patients with preeclampsia. One sign of endothelial dysfunction is the decline in biological activity of endothelial derived NO. NO biological half-time in vivo is less than 1 second. Nitric oxide is produced by the five-electron oxidation of L-arginine which is catalyzed by the enzyme eNOS. This research will observes the expression of eNOS in HUVECs PE model which

were exposed to 5, 10, 20 µg/ml LOX-1 MAb (lectin-like oxidized LDL receptor monoclonal antibody).

Objectives

To know the effect of LOX-1 MAb on the expression of eNOS in Preeclamptic HUVECs Model.

Methods

The study used HUVECs PE model which is HUVECs culture that was exposed with pre-eclamptic serum and it shown endothelial dysfunction. HUVECs culture was taken from the endothel of umbilical cord of newborn. HUVECs culture were divided into four groups: (1) HUVECs + Preeclamptic serum (HUVECs PE model), (2) HUVECs PE Model + LOX-1 MAb 5 µg/ml, (3) HUVECs PE Model + LOX-1 MAb 10; µg/ml, 4) HUVECs PE Model + LOX-1 MAb 20 µg/ml. We performed immunocytochemistry study using primary antibody (anti eNOS) while eNOS expression was observed in each group. The data were analyzed using ANOVA, Tukey's test, Correlation and Regression test.

Results

eNOS expression in group 1 was significantly different with group 2, 3 and 4 ($p < 0.05$). Group 2 was significantly different with group 1, 3 and 4 ($p < 0.05$). In group 4 and 5 there were no significant difference each other, but both were significantly different with group 1 and 2 ($p < 0.05$). About 72% of the expression of eNOS in HUVECs PE model were influenced by exposure LOX-1 MAb and the other 28% were influenced by other factors. In the observation of HUVECs PE model, we found that the higher dosage of LOX-1 MAb given on the model, the eNOS expression will increase proportionally.

Conclusion

Exposure of LOX-1 MAb will significantly increase eNOS expression on HUVECs PE model. We concluded that the higher dosage of LOX-1 MAb given on the HUVECs PE model, the eNOS expression will increase proportionally.