Pre-eclampsia is a disease in pregnancy, characterized by hypertension and proteinuria. Preeclampsia and eclampsia are major causes of maternal and fetal mortality and morbidity in Indonesia. The etiology of pre-eclampsia is not clear, but it is believed that placental and systemic oxidative stress cause endothelial cell dysfunction and injury. Placental oxidative stress is also linked to fetal growth restriction. In our previous study it is shown that placental responses to overcome the oxidative stress were not optimal. Twenty five percent pregnant women with pre-eclampsia delivered their babies with low birth weight or premature. Heat shock protein (HSP 70) is a protein produced in the cells and is essential for cellular recovery, survival and maintenance of homeostasis. The purpose of this study was to recognize the factors that influence the fetal growth development and to compare the correlation between MDA, and HSP 70 production in placental of severe pre-eclampsia, mild pre-eclampsia and normal pregnancy.

Placentas were donated by 20 pregnant women with pre-eclampsia (10 with severe pre-eclampsia and 10 with mild pre-eclampsia) and 10 normotensive pregnant women as control group after delivery. Placenta was cultured in RPMI and 20% FBS, and the supernatant were collected at day 3. MDA was measured using spectrophotometer while HSP 70 was measured using enzyme-linked immunosorbent assay.

The results showed that all the babies from normotensive pregnant women were born with normal weight, while 6 babies from pre-eclamptic women (3 from mother with severe pre-eclampsia and 3 from mild preeclampsia) were born with low birth weight or premature babies. Mean arterial pressure (MAP) significantly showed a strong negative correlation with placenta weight (r = -0.57, p <0.001). It is believed that the high MAP is the major cause of placental and fetal growth restriction. The MDA and HSP concentration did not differ significantly between women with severe and mild pre-eclampsia when compared with normotensive pregnant women. The MDA concentration was higher in the severe pre-eclampsia (7.13±5.36 nmol/ml) patients compared to patients with mild pre-eclampsia and the control group, but these differences were not significant. The HSP 70 concentration in women with mild pre-eclampsia was very high (10.15±12.39 nmol/ml). Although the difference was not significant, it indicates homeostasis response in mild pre-eclamptic women is relatively good. This response was abated in severe preeclamptic women, indicated by a low HSP 70 concentration (3.77±3.08 nmol/ml). This study also showed no significant correlation between MDA and HSP70 concentration. Conclusion: MAP, MDA and HSP have a role in the placental and fetal growth restriction.

Key word: MAP/MDA/HSP 70/ placenta/pre-eclampsia