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Serum maternal concentration of ferritin, zinc and hemoglobin during early second half of normal pregnancy does not influence birth weight in Semarang Indonesia**Julian Dewantiningrum**

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Introduction: The relation of serum maternal concentration of ferritin, zinc and hemoglobin status and birth weight has been evaluated. It is known that serum status of ferritin, zinc and hemoglobin and zinc during pregnancy is essential for health of optimal outcomes of the fetus. Micronutrient deficiency is a major problem in women of reproductive age in many developing countries, such as Indonesia. One of the most common micronutrient deficiencies in developing countries is zinc deficiency. Low zinc levels during pregnancy are associated with low birth weight because it disturbs transcription, translation of DNA and protein synthesis in rapid growth period. Zinc is also related with anemia. Low status of hemoglobin in pregnancy is also associated with low birth weight and higher perinatal mortality in the babies. Anemia also related with low ferritin. So, the aim of this cross-sectional study was to investigate of the relationship between maternal serum ferritin, zinc and hemoglobin status to birth weight.

Method: This is a cross-sectional study. The subjects were pregnant woman who attend antenatal care at 15 primary health care services in Semarang Central Java during 2017. The inclusions criteria are singleton pregnancy and 20-24 weeks of gestation. They were excluded if having maternal disease before and during pregnancy. We took blood vein from subjects and examined ferritin, zinc and hemoglobin. After delivery, we weighed birth fetal weight. We also collected maternal age, maternal weight and BMI. Statistical analysis was done using Kolmogorov-Smirnov test to analyze normal distribution or not. The student t test was used to detect association between serum maternal zinc, hemoglobin and ferritin concentrations to birth weight. Correlation among ferritin, zinc and hemoglobin was also analyzed. A value $p < 0.05$ was considered statistically significant. Anemia defines if hemoglobin level < 11 gr/dL. Low level of serum maternal ferritin is < 12 μ g/L and low level of serum maternal zinc is if < 66 μ g/dL.

Result: Total of 246 subjects involved in this study. Data showed normal distribution. Independent sample t test showed no significant statistic difference among anemia, low level of ferritin and zinc to birth weight in normal pregnancy. Group of low ferritin level have mean birth weight of 3112.14 grams. Group of normal ferritin level have mean birth weight of 3128.04 grams ($p=0.9$). Mean birth weight of low level of zinc subjects was 3186 grams, higher than normal zinc subjects of 3113 grams ($p=0.29$). Anemia subjects have mean birth weight of 3064.05 grams, compare non anemia subjects of 3146.05 grams ($p=0.19$). The results of this study are different with other study. It might because we only recruited normal pregnancy. Correlation among serum maternal concentration of ferritin and zinc were good ($p < 0.001$). No correlation between ferritin and hemoglobin ($p=0.65$), neither zinc nor hemoglobin ($p=0.68$).

Conclusion: Serum maternal concentration of ferritin, zinc and hemoglobin do not associate with birth weight in normal pregnancy.

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