

審査の結果の要旨

Abstract of defense

氏名 リンダ デワンティ

Title: The Cord Blood Levels of Heavy Metals and Trace Elements and Their Relationship with Immune Functions of Mononuclear Cells in The Babies Born in Surabaya, Indonesia.

One hundred and twelve mother-infant pairs who met inclusion criteria were recruited as participants at four health centers, representing West, East, Center and South Surabaya from March to June 2008. Informed consents were collected before sample collection. Cord blood mononuclear cells (CBMC) were cultured together with either PHA-M, tuberculin PPD, or HDM to evaluate cell proliferation, cytokine production and T cell subpopulation (CD4⁺, CD4⁺CD25⁺, CD4⁺FoxP3⁺, CD8⁺, CD8⁺CD25⁺). Human IL-2 was added at the beginning of the culture to induce Treg cells expansion. Demographical as well as maternal immunological status (skin prick test for an allergen and tuberculin test) was also examined to control confounding factors for immunological outcome of baby. All statistical analyses was at p<0.05. The study protocol was approved by the Ethical Committee of the Graduate School of Medicine, the University of Tokyo and that of Airlangga University, Indonesia.

Findings:

1. Cu had positive correlation with IL-4 (Th2) cytokine and IFN- γ (Th1)
2. Cu had negative correlation with CD4⁺CD25⁺ and CD8⁺CD25⁺ cells, subpopulations of T cells with potential regulatory immune function, but this finding needs conformational study.
3. Zn correlated positively with the number of lymphocyte, and PPD-induced IFN- γ production.
4. Cd had positive correlation with IL-4 and negative correlation with MCH
5. Pb did not correlate with immune function but correlated negatively with MCH. 4 production induced by PPD.

Summary of findings:

This is the first study, which explores the prenatal exposure of metals and trace elements on immune function including Treg cells subpopulation of newborn baby with special consideration on the two common antigens in environment (PPD and HDM). In the 'normal level' for adult population, this study showed that Cu, Zn and Cd correlated with immune function of mononuclear cells in newborn baby. The finding is worth for getting PhD degree.