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Association of hair total mercury with serum ferritin level among Indonesian pregnant woman: a preliminary study

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Background

The exposure of Hg in pregnant women is an important issue since it can pass the placental blood barrier and affect to fetus. This study's aim is to investigate the correlation between hair total mercury level with serum ferritin concentration in pregnancy mother to know whether Hg exposure may affect iron deficiency that have harmful effect in pregnancy.

Methods

This is quantitative study with cross-sectional method design. Samples were 26 (from total 201 sample) pregnant mother from 11 community health centers in Semarang, Central Java, Indonesia. Hg level from about 0.5mg of scalp hair was measured using Inductively Coupled Plasma Mass Spectrometry (ICP-MS) method. Ferritin level was determined from serum blood using quantitatively spectrophotometry.

Results

As a preliminary result, total mercury (T-Hg) was determined from 26 hair sample of pregnant women, with mean level was 0.581 ± 0.288 (min-max: 0.009-1.204) mg/L. Serum ferritin mean level was 19.426 ± 11.301 ng/ml (min-max: 2.54-52.51). Then ferritin was categorized as low level group <12ng/mL (n=5), normal >12ng/mL (n=21), and tested using Mann-Whitney U test. The result showed significant different between hair T-Hg level and serum ferritin (p=0.01) among pregnant women. Using correlation Spearman test, we found moderate correlation between increased hair T-Hg level and lower serum ferritin (p=0.07, with r= -0.514). Subjects with T-Hg >0.7075mg/L had risk to have lower serum ferritin 8.0 x (95%CI=1.6-40.2).

Conclusion

The increased hair total mercury level is correlated with lower serum ferritin, indicating that mercury may affect an iron deficiency status in pregnant women.

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References

- Adeiran A, Gbadesegin A, Adeyemo T.A, Akinbami A.A, Akanmu A.S, et al. Haemoglobin and ferritin serum concentrations of pregnant women at term. *Obstetric Medicine*. 2011; 4: 152-155. Clarkson, T. W., & Magos, L. (2006). The toxicology of mercury and its chemical compounds. *Critical Reviews in Toxicology*, 36(8), 609-662. David, J., Nandakumar, A., Muniroh, M., Akiba, S., Yamamoto, M., & Koriyama, C. (2017). Suppression of methylmercury-induced MIP-2 expression by N-acetyl-L-cysteine in murine RAW264.7 macrophage cell line. *European Journal of Medical Research*, 22(1). de Burbure, C., et al. Renal and neurologic effects of cadmium, lead, mercury, and arsenic in children: evidence of early effects and multiple interactions at environmental exposure levels. *Environ. Health Perspect.* 2006; 114, 584-590. EFSA. Mercury as undesirable substance in animal feed. Scientific opinion of the panel on contaminants in the food chain. *EFSAJ*. 2008; 654,1-74. Esteban M, Schindler BK, Jiménez-guerrero JA, Koch HM, Angerer J, Rivas TC, et al. Mercury analysis in hair: Comparability and quality assessment within the transnational COPHES / DEMOCOPHES project. *Environ Res*. 2015; 141: 24-30. Geier, D. A., Pretorius, H. T., Richards, N. M., & Geier, M. R. (2012). A quantitative evaluation of brain dysfunction and body-burden of toxic metals. *Medical Science Monitor*, 18(7). Hoang V.A.T., Do H.T.T., Agusa T., Koriyama C., Akiba S., et al. Hair mercury levels in relation to fish consumption among Vietnamese in Hanoi. *J. Toxicol. Sci*. 2017; 42 (5), 651-662. IOMC (Inter-organization programme for the sound management of chemicals). Guidance for identifying populations at risk from mercury exposure. UNEP DTIE Chemicals Branch and WHO Department of Food Safety, Zoonoses and Foodborne Diseases. 2008. Lee Y.J. and Hwang I.C. Relationship between serum ferritin level and blood mercury



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