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

by Hardian

Submission date: 25-Feb-2021 08:17AM (UTC-0800)
Submission ID: 1517976423
File name: C5.pdf (209.8K)
Word count: 1200
Character count: 6937

EVENT ABSTRACT

Back to Event

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

Muflihatul Muniroh[1*], Saekhol Bakri[2], Ainun R. Gumay[1], Julian Dewantiningrum[3], Mulyono Mulyono[3] and Hardian Hardian[1]

[1] Department of Physiology, Faculty of Medicine Diponegoro University, Indonesia
[2] Departement of Public Health, Faculty of Medicine Diponegoro University, Indonesia
[3] Department of Pediatrics, Faculty of Medicine Diponegoro University, Indonesia

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 mothe[2] 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 quantitively 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□11.301ng/m[1]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 ferritrin (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.

Acknowledgements

We thank to Faculty of Medicine Diponegoro University, Indonesia for grant research fund No 588/UN7.5.4/HK/PP/2018.

References

Adediran 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

Korean children and adolescents. Blood Research. 2018; 53 (1): 18-24. Yamamoto, M., Khan, N., Muniroh, M., Motomura, E., Yanagisawa, R., Matsuyama, T., & Vogel, C. F. A. (2017). Activation of interleukin-6 and -8 expressions by methylmercury in human U937 macrophages involves RelA and p50. Journal of Applied Toxicology, 37(5). Yamamoto, M., Motomura, E., Yanagisawa, R., Hoang, V. A. T., Mogi, M., Mori, T., Eto, K. (2018). Evaluation of neurobehavioral impairment in methylmercury-treated KK-Ay mice by dynamic weight-bearing test. Journal of Applied Toxicology: JAT. Yasutake A, Matsumoto M, Yamaguchi M and Hachiya N. Current Hair Mercury Levels in Japanese: Survey in Five Districs. Tohoku J. Exp. Med. 2003; 199, 161-169.

Keywords: Hair total mercury, Serum ferritin, iron deficiency, Pregnant Women, Indonesia

Conference: International Conference on Drug Discovery and Translational Medicine 2018 (ICDDTM '18) "Seizing Opportunities and Addressing Challenges of Precision Medicine", Putrajaya, Malaysia, 3 Dec - 5 Feb, 2019.

Presentation Type: Oral Presentation **Topic:** Miscellaneous

Citation: Muniroh M, Bakri S, Gumay AR, Dewantiningrum J, Mulyono M and Hardian H (2019). Association of hair total mercury with serum ferritin level among Indonesian pregnant woman: a preliminary study. *Front. Pharmacol. Conference Abstract: International Conference on Drug Discovery and Translational Medicine 2018 (ICDDTM '18) "Seizing Opportunities and Addressing Challenges of Precision Medicine"*. doi: 10.3389/conf.fphar.2018.63.00095

 Received: 29 Nov 2018; **Published Online:** 17 Jan 2019.

* **Correspondence:** Dr. Muflihatul Muniroh, Department of Physiology, Faculty of Medicine Diponegoro University, Semarang, Indonesia, muflihatul.muniroh@fk.undip.ac.id

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

ORIGINALITY REPORT

3%	3%	0%	0%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	repository.unair.ac.id Internet Source	1%
2	worldwidescience.org Internet Source	1%

Exclude quotes	On	Exclude matches	Off
Exclude bibliography	On		