HYPERURICEMIA RISK IN SUBJECTS WITH MODERATE TO HIGH LEVELS OF PCDD/FS EXPOSURE

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Background and Aim: Hyperuricemia, the predisposing condition for gout, has been associated with hypertriglyceridemia and diabetes mellitus (Berkowitz 1966), and also be a risk factor for the development of coronary artery disease (Abbott et al. 1988). PCDD/Fs have been found to cause renal toxicity in experimental animals and elevate uric acid in epidemiology studies. The potential role of PCDD/Fs exposure as a preventable risk factor has raised attention of public health, especially since it's ubiquitous worldwide. We aimed to investigate and clarify the effect of moderate-to-high exposure to PCDD/Fs on hyperuricemia risk.
Methods: This cross-sectional study recruited 1657 healthy participants near a deserted pentachlorophenol factory (Chang et al. 2010). Renal function related factors were measured to examine associations with serum PCDD/Fs. We also investigated associations between serum PCDD/Fs and hyperuricemia risk. We compared associations of serum PCDD/F levels and estimated glomerular filtration rate (eGFR, renal function index) in both gender under and above 50-years-old.
Results: The eGFR reduces gradually with serum PCDD/F levels in all groups (men < and ≥ 50 50-years-old, women < and ≥ 50-years-old), especially for a sudden falling observed in men over than 50 years old. Serum PCDD/Fs were significantly increased with uric acid in male participants (Men: β= 0.230, p= 0.008; Women: β=0.035, p= 0.753; All: β= 0.148, p= 0.037). In addition, we further found that male participants with higher serum PCDD/F levels had a higher hyperuricemia risk than did the reference group (serum PCDD/F levels <11.4 pg WHO_{98}-TEQ_{DF}/g lipid) after adjusting for confounding factors (25 th to <50 th percentile, adjusted Odds Ratio (AOR) = 1.87 [95% CI = 1.13-3.10]; 50th to <75 th percentile, AOR = 2.44 [1.46-4.09]; ≥75 th percentile, AOR = 3.29 [1.89-5.74]).
Conclusions: We hypothesize that accumulated PCDD/Fs may reduce urate excretion and may heighten the risk of hyperuricemia in the general population.
References:
Abbott RD, Brand FN, Kannel WB, Castelli WP. Gout and Coronary Heart-Disease - the Framingham-Study. Journal of Clinical Epidemiology 1988;41:237-242.
Berkowitz D. Gout, hyperlipidemia, and diabetes interrelationships. JAMA 1966;197:77-80.
Chang JW, Chen HL, Su HJ, Liao PC, Guo HR, Lee CC. Dioxin exposure and insulin resistance in Taiwanese living near a highly contaminated area. Epidemiology 2010;21:56-61.