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2010 Annual Meeting Abstract Supplement

Late-Breaking and Grace Period Abstract Submissions

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2010 Society of Toxicology 49th Annual Meeting
Late-Breaking Abstracts

ABSTRACT FINAL ID: 2313 Poster Board 644
TITLE: Characterization and normalization of cholinesterase activity in rat saliva
AUTHORS/INSTITUTIONS: J.N. Smith, S. Lee, C. Timchalk, Biological Monitoring & Modeling, Battelle Memorial Institute, Pacific Northwest Division, Richland, WA; E.M. Klohe, Carroll College, Helena, MT
KEYWORDS: cholinesterase, saliva, biomonitoring.
ABSTRACT BODY: Abstract Body (Late Breaking Submission): Cholinesterases (ChE) are enzymes that catalyze the hydrolysis of carboxylic esters, such as the neurotransmitter acetylcholine. Organophosphate (OP) pesticides, which are commonly used in agriculture, inhibit ChE activity, and ChE inhibition in plasma and red blood cells is used routinely as a biomarker for human OP exposure. Currently, salivary ChE activity is being explored as a potential non-invasive biomarker for OP exposure, however little is known about baseline ChE activity. In order to characterize baseline salivary ChE, saliva was collected from 5 adult male Sprague-Dawley rats over 2 h, salivary ChE was measured using the Ellman assay, and total salivary protein was measured using the bicinchoninic acid (BCA) protein assay. Comparison of total ChE activity indicated that rat salivary ChE is variable among individual rats at each time point of collection (coefficient of variation (CV) ranging 33-65%) and over the entire duration of collection for each rat (CV ranging 16-104%). Overall CV for all rats over the entire collection time was 67%. Variation of total protein in saliva was also observed among individuals at each collection time (CV ranging 36-57%) and over the duration of collection for each individual (CV ranging 15-105%) as well. Protein content and total ChE activity were correlated (0.73 correlation coefficient, $p < 0.001$), and normalization of ChE activity by total protein resulted in a CV reduction to 37% for all rats over the entire collection time. These results demonstrate the variability of salivary ChE activity and suggest that salivary protein may be useful to normalize ChE activity in saliva for biomonitoring purposes.

ABSTRACT FINAL ID: 2314 Poster Board 645
TITLE: Blood concentration of Zink, Manganese, Chromium and Cadmium are independently related to abdominal obesity in the general elderly population
AUTHORS/INSTITUTIONS: M.P. Lind, M. Rönn, Department of Medical Sciences, Occupational and Environmental Medicine , Uppsala University, Uppsala, Sweden; L. Lind, Department of Medical Sciences, Acut and Internal Medicine, Uppsala University, Uppsala, Sweden
KEYWORDS: obesity, metals, elderly.
ABSTRACT BODY: Abstract Body (Late Breaking Submission): BACKGROUND: Environmental contaminants have recently been implicated in the pathogenesis of obesity. The present study AIMS to explore the relationship between concentrations of some toxic metals and of some essential metals which have the potential to be toxic and to induce obesity. MATERIAL AND METHODS: In the Prospective Study of the Vasculature in Uppsala Seniors (PIVUS) study, obesity was evaluated by body mass index (BMI), waist circumference and fat mass determined by dual-energy X-ray absorptiometry (DXA) together with 11 different trace and heavy metals in blood (Al, Cd, Co, Cr, Cu, Hg, Mn, Mo, Ni, Pb and Zn) in 1016 subjects aged 70 years. RESULTS: In multiple regression analysis, blood concentrations of Zn and Mn were positively ($p< 0.05$) and Cr and Cd negatively related ($p< 0.05$) to waist circumference and trunk fat measured by DXA independently of each other and following adjustment for gender, total daily energy intake and intake of carbohydrates, proteins and fat as well as for serum creatinine. These four metals were less consistently related to BMI and total body fat compared with waist circumference and trunk fat.