

Role of Selenium and Vitamin E in Occupational Exposure to Heavy Metals (Mercury, Lead and Cadmium): Impact of Working in Lamp Factory

Authors : Tarek Elnimr, Rabab El-kelany

Abstract : Heavy metals are environmental contaminants that may pose long-term health risks. Unfortunately, the consequent implementation of preventive measures was generally delayed, causing important negative effects to the exposed populations. The objective of this study was to determine whether co-consumption of nutritional supplements as selenium and vitamin E would treat the hazardous effects of exposure to mercury, lead and cadmium. 108 workers (60 males and 48 females) were the subject of this study, their ages ranged from 19-63 years, ($M = 29.5 \pm 10.12$). They were working in lamp factory for an average of 0.5-40 years ($M = 5.3 \pm 8.8$). Twenty control subjects matched for age and gender were used for comparison. All workers were subjected to neuropsychiatric evaluation. General Health Questionnaire (GHQ-28) revealed that 44.4% were complaining of anxiety, 52.7% of depression, 41.6% of social dysfunction and 22.2% of somatic symptoms. Cognitive tests revealed that long-term memory was not affected significantly when compared with controls, while short term memory and perceptual ability were affected significantly. Blood metal levels were measured by Inductively Coupled Plasma - optical emission spectrometry (ICP-OES), and revealed that the mean blood mercury, lead and cadmium concentrations before treatment were 1.6 mg/l, 0.39 mg/l and 1.7 μ g/l, while they decreased significantly after treatment to 1.2 mg/l, 0.29 mg/l and 1.3 μ g/l respectively. Anti-oxidative enzymes (paraoxonase and catalase) and lipid peroxidation product (malondialdehyde) were measured before and after treatment with selenium and vitamin E, and showed significant improvement. It could be concluded that co-consumption of selenium and vitamin E produces significant decrease in mercury, lead and cadmium levels in blood.

Keywords : mercury, lead, cadmium, neuropsychiatric impairment, selenium, vitamin E

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