ROLE OF SELENIUM AND VITAMIN E IN OCCUPATIONAL EXPOSURE TO HEAVY METALS (MERCURY, LEAD AND CADMIUM): IMPACT OF WORKING IN LAMP FACTORY

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Abstract: Heavy metals are environmental contaminants may pose long-term health effects. Unfortunately, the consequent implementation of preventive measures was generally delayed, causing serious 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. 36 workers were the subject of this study, their ages ranged from 19-63 years, (mean = 29.5±10.12); 20 males and 16 females. They were working in lamp factory for an average of 0.5-40 years (mean= 5.3±8.8). Twenty control subjects matched for age and gender, habits as well as circumstances 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 using an inductively coupled plasma mass spectrometry (ICP/ MS). The mean blood mercury, lead and cadmium concentrations before treatment were 1.6 mg/l, 0.39 mg/l and 1.7 µg/l, while they decreased significantly after treatment to 1.2 mg/l, 0.29 mg/l and 1.3µg/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. Co-consumption of selenium and vitamin E produces significant decrease in mercury, lead and cadmium levels and significant improvement in the antioxidative activity which may treat the neuropsychiatric disorders occasioned by chronic occupational exposure to heavy metals.

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