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Occupational Exposure to Heavy Metals in Two Occupational Settings in Jordan

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Abstract: Some occupations involve the exposure of workers to heavy metals. Two occupations were selected dental technicians and welding technicians. The objectives of the present studies are: to study the prevalence of selected heavy metal among workers in Jordan and to correlate the toxicity of selected heavy metals with occupational diseases. Study methodology included constructing a questionnaire to collect data from study participants and measuring heavy metals using atomic absorption spectroscopy. The questionnaire was constructed through reviewing various related studies and validated through pretesting of 20 participants to check for clarity and consistency of answers. Study participants included 50 dental technicians and 51 welders. Participants in control groups were selected from non-exposed workers in each setting. Study findings: among dental technicians, two heavy metals were measured, chromium and cobalt. the mean concentration of chromium is $46.18 \pm 58.2 \mu\text{g dL}^{-1}$ which is significantly ($p = 0.003$) higher than the mean concentration of control group ($17.84 \pm 43.45 \mu\text{g dL}^{-1}$). The mean concentration of cobalt is $2.23 \pm 6.53 \mu\text{g dL}^{-1}$ which is significantly ($p = 0.01$) higher than the control group ($0.20 \pm 0.38 \mu\text{g dL}^{-1}$). The mean concentration of chromium among welders is $25.05 \pm 14.60 \mu\text{g dL}^{-1}$ and this is significantly ($p = 0.000$) higher than the mean concentration of control ($15.87 \pm 14.52 \mu\text{g dL}^{-1}$). About 50% of jewelry technicians reported being affected by diseases which mainly included allergy. Epilepsy (5.88%) and diabetes (13.7%) were reported among welders but not dental technicians. Sensitivity and asthma were more prevalent among welders compared with dental technicians. There is an occupational exposure to heavy metals which have to be periodically checked for technical workers in such occupations not to develop future occupational diseases