

Occupational lead exposure of soldering workers in an electronic factory

Abstract

A cross-sectional study was conducted on 83 female electronics factory workers. The respondents comprised 50 exposed workers who use lead alloy solder and 33 unexposed workers. The objective of this study was to assess the lead exposure of these workers. Breathing zone were sampled using air sampling pumps. Dust samples were collected by wipe method. Venous blood collected and blood pressure were measured. All lead analyses were carried out with Graphite Furnace Atomic Absorption Spectrophotometer. The mean air lead for exposed workers ($570. \pm 0.93 \mu\text{g}/\text{m}^3$) was significantly higher than the unexposed workers ($0.0067 \pm 0.0045\mu\text{g}/\text{m}^3$) ($p < 0.001$). The right side surface area ($49.10 \pm 34.19 \mu\text{g}/\text{dl}$) was significantly higher than the left side ($8.45 \pm 9.04 \mu\text{g}/\text{cm}^2$) ($p < 0.001$). The mean blood lead for the exposed workers ($5.10 \pm 1.42 \mu\text{g}/\text{dl}$) was not significantly higher than the unexposed workers ($5.09 \pm 0.88 \mu\text{g}/\text{dl}$). The mean blood pressure was 121 / 72 mmHg and 117 / 72 mmHg for the exposed and unexposed workers respectively. No significant difference between the blood lead concentration ($p = 0.786$), systolic blood pressure ($p = 0.554$) and diastolic blood pressure ($p = 0.955$) between the 2 groups. No significant correlation found between blood lead with personal air lead ($p = 0.447$), left side surface area dust lead ($p = 0.937$), right side surface area dust lead ($p = 0.291$), systolic blood pressure ($p = 0.201$) and diastolic blood pressure ($p = 0.485$). In conclusion, since the biological indicators showed normal values, the electronic circuit board soldering workers, are not at high risk of exposure to occupational lead.