

Occupational lead exposure and homocysteine among component manufacturing factory workers

Abstract

Homocysteine could be a mechanism that underlies the effects of lead on cardiovascular system. This study aims to identify the relationship between lead exposure and homocysteine levels among workers. A comparative cross-sectional study was carried out on 80 workers of an automotive components manufacturing factory; that comprised of 40 exposed workers and 40 non-exposed workers. Blood samples of respondents were taken by fingerprick. The blood samples were analyzed for blood lead concentration by using Atomic Absorption Spectrometry Graphite Furnace Model GBC 908AA. Besides that, ELISA Kit was used to show the homocysteine level among the respondents. Questionnaires were used to obtain demography information of respondents. Results from the statistical analysis showed that the mean blood lead concentration for exposed respondents was 5.53 ± 4.74 $\mu\text{g/dL}$ and 3.53 ± 2.81 $\mu\text{g/dL}$ for the comparative respondents. Mann-Whitney U test showed that there was no significance difference between the mean blood lead concentration of the exposed and comparative group ($z = -1.178$; $p = 0.075$). The blood lead concentration ranged 0.68-17.95 among the exposed group and with a range of 0.084-11.96 for the comparative group. The mean homocysteine level ($\mu\text{mol/L}$) was 32.48 ± 2.481 $\mu\text{mol/L}$ for the exposed group and 16.50 ± 4.0960 $\mu\text{mol/L}$ for the comparative group. There was a significant difference in homocysteine level ($\mu\text{mol/L}$) between the exposed (32.48 ± 2.481) and comparative (16.50 ± 4.0959) groups ($z = -7.699$, $p < 0.001$). The range of homocysteine level among exposed group was 28.64 to 38.54 and for comparative group was 7.58 to 22.41. The lead exposure among exposed group ($r = 0.049$; $p = 0.764$) and comparative group ($r = -0.053$; $p = 0.743$) was not significantly correlated with the concentration of homocysteine. The occupational lead exposure has no correlation with homocysteine level among workers at automotive component manufacturing factory.