

Relationship between exposure to particulate matter and biomarkers among bus drivers in Klang Valley, Malaysia

ABSTRACT

This cross-sectional comparative study investigates the association between particulate matters (PM; PM₁₀, PM_{2.5} and ultrafine particle (UFP) and concentration of biomarkers; Interleukin-6 (IL-6) and Tumor Necrosis Factor-Alpha (TNF- α) using 62 bus drivers as exposed group and 62 administrative staff as comparative group in Klang Valley, Malaysia. T-test results showed that the mean exposure level of PM₁₀ ($t = 8.14$, $p < 0.01$), PM_{2.5} ($t = 9.95$, $p < 0.01$) and UFP ($t = 19.61$, $p < 0.01$) were significantly higher among the bus drivers compared to comparative group. Mann-Whitney U test of IL-6 ($z = -2.43$, $p < 0.05$) and TNF- α ($z = -5.88$, $p < 0.01$) were also found to be significantly higher in the bus drivers. Positive correlations were found between the exposure level of PM and concentration of biomarkers. In conclusion, the bus drivers showed higher concentration of IL-6 and TNF- α and were at a higher risk of getting respiratory illnesses compared to comparative group. Thus, more attention should be given on the control of high level of exposure to PM in order to minimize the adverse health effects among the groups at risk.

Keyword: PM₁₀; PM_{2.5}; UFP; IL-6; TNF- α ; Respiratory symptoms; Bus driver