

Toxic effect of naphtha exposure on respiratory system among workers in the tyre industry.

ABSTRACT

A cross-sectional study was carried out on workers in a tyre manufacturing industry in Malaysia to determine the effects of naphtha exposure on lung functions and respiratory symptoms. Sixty male workers exposed to naphtha and 42 unexposed workers were selected for this study. Personal air monitoring carried out using solid sorbent tubes and low flow pumps (Model: PAS-500 Personal Air Sampler). Personal air monitoring showed that the mean air naphtha concentration was 28.50 mg/m³, the median was 28.47 mg/m³ and the inter quartile range of 1.27 mg/m³. The range was from 0.19 to 200.51 mg/m³ (PEL is 400 mg/m³). The lung function tests showed in 2 groups for all the 3 parameters (FVC%, FEV1% and FEV1/FVC) were in exposed group 96.16, 85.23 and 0.791 respectively and in Unexposed group was 113.23, 116.28 and 0.903 respectively. The lung function tests showed that there were significant difference in the 2 groups for FVC% ($p < 0.001$), FEV1% ($p < 0.001$) and FEV1/FVC% ($p = 0.002$). Multiple linear regression test showed that monthly household income significantly influence the FVC% predicted ($b = 0.003$, $p < 0.001$) and FEV1% predicted ($b = 0.006$, $p < 0.001$). In conclusion there was an inverse relationship between air naphtha concentrations and lung functions ability. Early impairment of the respiratory system is detected on the workers who are exposed to naphtha which made up of several chemicals.

Keyword: Lung function; Naphtha concentrations; Tyre manufacturing process.