ABSTRACT

Effect of Toluene Vapor Exposure To the Toluene Blood Level, Superoxide dismutase Enzyme, Liver Function, and Worker Health Complaints at Car Body Repair in Surabaya

Toluene is often used as a solvent in car painting, so toluene vapor can expose the worker through the respiratory tract. Toluene can cause liver dysfunction, lung dysfunction, central nervous system, kidneys, skin, hearing, and vision. This study aims to analyze the effects of toluene vapor exposure on blood toluene levels, liver dysfunction, and enzyme superoxide dismutase (SOD) levels, and health complaints.

The method of this study was analytical observation with cross-sectional study. The population was car painting workers and administrative workers with a randomly selected sample of some 11 people for each group. Sampling of air toluene levels done with NIOSH method 1501 and analyzed by Gas Chromatography-Hydrocarbon Analyzer. SGOT and SGPT enzyme analysis was conducted using kinetic UV Methods. While the measurement of blood levels of toluene and SOD using ELISA method.

The results showed that air toluene levels in car painting room was 51.7574 ppm, while the administrative room was 0.55735 ppm. The results using linear regression analysis showed a significant effect on toluene vapor exposure to the toluene blood levels ($\beta = 0.576; p = 0.000$), liver dysfunction SGOT ($\beta = 0.530; p = 0.040$), SGPT ($\beta = 0.607; p = 0.026$), and enzyme SOD levels ($\beta = 0.929; p = 0.001$). Results of logistic regression analysis showed that there were significant effects of exposure to toluene vapors respiratory disorders ($\beta = 2.862; p = 0.019$) and there is significant influence blood levels of toluene to impaired liver function ($\beta = 3.113; p = 0.041$).

The conclusion of this study was toluene vapor exposure could increase toluene blood levels, SOD enzyme, liver function, and workers health complaints at car body repair in Surabaya. The suggestion to minimize worker’s health problems caused by toluene exposure, it is necessary to monitor the health of workers and indoor air quality regularly, as well as the use of special gas masks.

Key Words : toluene vapor; blood toluene level; liver function; SOD enzyme