

Siriporn Singthong 2014: Evaluation of Cytotoxicity of Occupational Exposure to Trichloroethylene in Thailand. Doctor of Philosophy (Bioscience), Major Field: Bioscience, Faculty of Science. Thesis Advisor: Associate Professor Pannee Pakkong, M.S. 172 pages.

A cytotoxicity assessment of TCE exposed to Thai workers were studied. This research were aimed to determine the level of TCE exposure rate in environment and the cytogenetic damage in peripheral blood by micronucleus (MN) assay test. The analyzed samples collected from 242 workers-and 66 controls. Everyone was informed about the scope of this study and individually interviewed. The TCE exposure rate was analyzed in airborne sampler. The cytogenetic toxicity were analyzed the level of TCE metabolites, Trichloroacetic acid (TCA) in urine and in the peripheral blood sample. The results showed that the mean value of TCE in environment at the first and second phase of the study were within the limit level of safety standards. However, the urinary TCA was 53.5 % of exposed workers were higher than standard limit values. Six months later after the participants were educated about universal precaution in the workplace was 11.13 mg/L. The results indicated that only 25 % of the exposed group had urinary TCA higher than standard values. The genotoxic test showed that 29.4% of workers exposed to TCE had an initial DNA damage. The frequencies of micronucleus in exposed workers and control were 5.778 and 1.339 /1000 MN, respectively. Individuals with high TCA level in urine showed a higher frequency of MN. The exposed group revealed a statistically significant increase in the level of DNA damage compared with the controls ( $P < 0.01$ ). This studied data had showed a significant correlation between TCA level in urine and MN frequency ( $r=0.127$ ,  $p<0.01$ ). In addition, there is a positive correlation between TCA level and duration of work per day, education level and individual age ( $p<0.01$ ). In conclusion, this study had demonstrated an association between exposure to TCE and DNA damage (increased MN frequency). The cytogenetic damage in workers exposed to TCE was associated with occupational exposure time, concentration of TCE, mechanism of xenobiotic secretion and life style.

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