

Thesis Title: A STUDY OF CHROMOSOMAL CHANGES IN  
SHOE WORKERS EXPOSED TO TOLUENE AND  
BENZENE IN ADHESIVE

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ABSTRACT

The method of cytogenetic analysis of peripheral blood lymphocytes was used to examine chromosomal change of workers exposed to toluene and benzene which release from adhesive and other chemical used in shoe industry.

50 workers from textile factory (control group) and 50 workers from shoe factories (exposed group) are match paired together by the concept of the least

difference on 3 main variable factors: age, sex, and smoking habit. The blood of 50 workers from control group and of 50 workers from exposed group are obtained for chromosome aberration and sister chromatid exchanges (SCEs) analysis. Adhesive and commercial toluene used in shoe factories are analysed for percentage of toluene and benzene. Toluene and benzene concentration in ambient air are also analysed. Due to its difference concentration of toluene and benzene, exposed workers are divided into two subgroup as low exposure group (n=34) and high exposure group (n=16).

The result of chromosomal studies show statistical increase on aberration cell per 100 metaphases and SCE ( $p < 0.001$  and  $p < 0.05$  respectively). Statistical significant increase are also found only on chromatid type not chromosome type aberration. For exposed subgroup, there are statistical difference on gap of chromatid type aberration and SCEs ( $p < 0.005$  and  $p < 0.01$  respectively). Prevalence rate of chromosome aberrations and SCEs in exposed group are statistical higher than control group.

In this study, the results indicate that toluene and benzene concentrations in ambient air of these shoe industries are at unsafe levels.