

ABSTRACT

FRAGMENTASI DNA SPERMATOZOA PADA PEKERJA BENGKEL PENGECATAN MOBIL DI MALANG

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Objective: The aim of this study was to prove that exposure to benzene, toluene, and xylene in automobile painters are risk factors for the increase in sperm DNA fragmentation.

Method: This research was observational descriptive cross-sectional study design. Research conducted at the Laboratory of Biochemistry-Biomolecular, Faculty of Medicine, Brawijaya University. The research sample are the semen of 15 married automobile painters and 12 control workers. The sample group is distinguished through air samples which were analyzed to detect benzene, toluene, and xylene and these chemicals was detected in automobile painters' working environment. All of the ejaculate were tested by TUNEL Assay in combination with Propidium Iodide (PI) and analyzed by flowcytometry. TUNEL assay results are then compared statistically to assess the difference, and analyzed the risk of an increase in sperm DNA fragmentation in automobile painters.

Result: The results showed the control workers have an average of 14.9% of sperm DNA fragmentation and automobile painters have an average value of 47.66% of sperm DNA fragmentation. Comparison test showed a statistically significant difference, $p = 0.000$ ($p < 0.05$, CI 95%). For risk factors, an analysis with chi-square using the two groups of workers and two groups of TUNEL assay results which is categorized into high risk and low risk of DNA fragmentation with the cut-off of 30%. Statistical analysis showed an increased risk of sperm DNA fragmentation in automobile painters is significant, $p = 0.001$ ($p < 0.05$, CI 95%).

Conclusion: It is concluded that there are differences in sperm DNA fragmentation in automobile painters compared to control workers and there is a risk of an increase in sperm DNA fragmentation in automobile painters.

Keywords: fragmentation, DNA, spermatozoa, TUNEL, propidium iodide, flowcytometry