

**CHRONIC EXPOSURE TO PARAQUAT ALTERS SPERMATOGENESIS AND
NUCLEAR DNA INTEGRITY OF EPIDIDYMAL SPERM IN MICE**

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Experimental evidence suggests that unintentional exposure to environmental chemicals may alter reproductive capability of males. The aim of the present study was to investigate effects of low concentrations of Paraquat (1,1'-dimethyl 1-4,4'-bipyridinium), a commonly used broad-spectrum weedicide in Sri Lanka, on spermatogenesis of mice. Sexually mature mice were treated with 4 doses (1, 2, 4 and 8 mg/kg body weight) of Paraquat (n=10/group) and the vehicle (distilled water; n=10). Each dosage (in 0.1 ml) was injected into the scrotal sac every other day for 7 days. Testicular sperm count and histological studies [diameter of seminiferous tubule (width), thickness of the tubules, number of cycles] were determined on post treatment day 7. Nuclear integrity of sperm DNA and abnormalities in sperm morphology (using separate sperm smears) were determined. Treated mice showed a significant (p<0.05) increase in sperm abnormalities (for 1, 2 and 4 mg/kg doses) and nuclear integrity of sperm DNA in caput, corpus and cauda sperm of the epididymis. Results revealed disruption of spermatogenesis process in all treated groups. Sperm abnormalities were mainly concentrated on the sperm head. In addition, a significant (p<0.05) increase in tubular diameter and a significant (p<0.05) reduction in Sertoli cell number and in round and elongated spermatids were observed in all treated groups. Earlier studies have shown that Ethylene Glycol Monomethyl Ether and its by products cause severe damages in the spermatogenesis in rat. This study suggests whether effects of Paraquat are mediated through damaged Sertoli cells. But a conclusion cannot be drawn from the present findings alone. However, it is possible that free radical formation can interfere with integrity of Sertoli cells and spermatogenesis. Further experiments are needed to conclude the mechanism of action of Paraquat on epididymal sperm DNA.

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