

DNA Damage Induced in the Germ and Bone Marrow Cells of Mice by Caffeine

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Abstract

Caffeine is a major constituent of many drugs and also widely and immensely consumed in beverages and soft drinks. The public health implication of the habitual and indiscriminate consumption of caffeine containing products has prompted studies on its safety evaluation. In this study, we investigated the potentials of caffeine to induce abnormal sperm cells in the testes and micronuclei (MN) in the bone marrow cells using the sperm morphology and MN assays in mice. For these assays, mice were administered intraperitoneally (IP) caffeine at dose levels of 0.39mg/kg body weight (bwt), 0.78mg/kg bwt, 1.56mg/kg bwt and 3.12mg/kg bwt., and normal saline and cyclophosphamide were used as negative and positive controls respectively. The sperms of mice from the caudal epididymes examined at 5 and 10 weeks from the first day of treatment showed that caffeine induced dose-dependent significant ($p < 0.05$) formation of abnormal sperm cells. Induction of micronucleated polychromatic erythrocytes was not dose dependent but statistically significant ($p < 0.05$) at the doses of 1.17mg/kg body weight and 1.56mg/kg body weight. These suggest that caffeine may be a potential germ and somatic cell mutagen, and thus its indiscriminate use may be of potential human health risk.

Key words: Caffeine, genotoxicity, mice, micronucleus, spermatozoa