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ZEARALENONE INDUCES MALE GERM CELL APOPTOSIS IN RATS

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Zearalenone (ZEA), a nonsteroidal estrogenic mycotoxin, is known to cause toxicity of testis in male rats. To investigate whether apoptosis is involved in ZEA-induced testicular toxicity and to identify the stage and target germ cell type, 10-weeks-old Sprague-Dawley male rats were treated with a single intraperitoneal (i.p.) dose of ZEA (5mg/kg) and euthanized at 3, 6, 12, 24, and 48 h subsequently. Histopathologically, germ cell degeneration was found at stages I-VI 12 h after dosing. Degenerating germ cells were shown to undergo apoptosis as revealed by in situ terminal deoxynucleotidyl transferase-mediated dUTP nick end labeling (TUNEL). The frequency of TUNEL-labeled germ cells increased in a stage-specific manner, the peak frequency gradually progressing at stages I-VI of seminiferous tubules with time after dosing, suggesting that the damaged germ cells, especially spermatogonia and spermatocytes, gradually underwent the processes leading to apoptosis. DNA laddering on gel electrophoresis was apparent 12 h after dosing. The results demonstrated that a single dose of ZEA induces testicular germ cell apoptosis in a time-dependent and stage-specific pattern. This study has established that apoptosis is the principal mechanism contributing to germ cell depletion and testicular atrophy following ZEA exposure.

keyword : Zearalenone, Apoptosis, Testicular toxicity