Cytotoxic Effects of Aflatoxin B₁ on Rat Peritoneal Lavage Cells: Induction of DNA Single Strand Breaks and Apoptosis

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ABSTRACT DNA single strand breaks and apoptosis in Aflatoxin B₁ (AFB₁) -induced cytotoxicities in rat peritoneal lavage cells (RPLC) were investigated. The results of trypan blue dye exclusion assay indicated that significant cytotoxic effects were obvious when RPLC were exposed to 10, 50 and 100 μg/mL AFB₁ for 1 and up to 48 hours, and the effects were in dosage and time-dependent manners. These cells also exhibited significant increases in DNA single strand breaks by SCGE assay in dosage-dependent patterns. These AFB₁ treatments were also capable of inducing 185-200 bp DNA ladder fragmentation after 18 hours co-incubation. Light and electron microscopic analysis confirmed that RPLC for both 12 and 24 hours could process to necrosis and apoptosis on the same RPLC sample by AFB₁ treatment at 50 μg/mL. Western blot analysis of total cellular protein revealed that the RPLC did not express p53 and Bcl-2 proteins after exposed to 50 μg/mL AFB₁ for 0, 6, 12 and 24 hours. In conclusion, cellular toxicities including apoptosis and necrosis in RPLC could be the consequences of nucleic DNA damages which were resulting from AFB₁ exposure. The role of Bcl-2 and p53 in AFB₁ toxicities remained to be determined in the future studies. [Ying-Ling Sun, Chiang-Hsiang Cheng, Jiann-Gwu Lee. Cytotoxic Effects of Aflatoxin B₁ on Rat Peritoneal Lavage Cells: Induction of DNA Single Strand Breaks and Apoptosis. Taiwan Vet J 33(2): 104-113, 2007. *Corresponding author TEL: (02)3366-3873, E-mail: dvnjgcls.ntu.edu.tw]

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