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Acute Taxol nephrotoxicity: Histological and ultrastructural studies of mice kidney parenchyma

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Taxol;
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Micronucleus assay;
MTD (tolerated);
ID (dose);
MD

Abstract Taxol is a microtubule inhibitor drug widely used in treatment of many types of cancer. Nephrotoxicity is the most hazardous effect complicating chemotherapy in general and kidney functions must be monitored early during any chemotherapeutic course. The main objective of the present study was to investigate the effect of acute Taxol nephrotoxicity in mice. In the present study Taxol at different doses; MD, ID and MTD (0.6, 1.15 and 1.7 mg/kg), respectively, was given by intra-peritoneal route to 54 adult male mice with an average body weight of 20–25 g. Kidney samples were taken 6, 24, 48 h following administration, fixed in 10% neutral buffered formalin, paraffin sections 5 μ m thick were stained by haematoxylin and eosin and PAS and then examined for histological changes. Samples from animals treated by the maximum dose (MTD = 1.7 mg/kg) for 48 h were fixed in 3% gluteraldehyde in phosphate buffer (pH 7.4) and processed for transmission electron microscope. Taxol given for short duration was found to produce marked degenerative changes in kidney parenchyma even in minimum tolerated dose (MD = 0.6 mg/kg). Individual variations were observed regarding the degree of nephrotoxicity. There was marked loss of renal tubules epithelial lining, damage of brush border and formation of hyaline casts within the damaged tubules. The alterations were in the form of both necrotic and apoptotic changes in the kidney tubules. Focal atrophy of glomerular tufts was also observed. Vascular congestion and degenerative changes in renal blood vessels were occasionally evident in some samples. Ultrastructure study revealed damage of glomerular membrane. Proximal tubule showed loss of basal infoldings, damage of brush border, mitochondrial degeneration and nuclear changes. Distal tubules also showed demarked degenerative changes. Increased frequency of micronuclei proved that Taxol had genotoxic effects in

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