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Studies on the cantharidin-mediated antitumor activity and toxicity in tumor-bearing mice

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Cantharidin, a type of terpenoid, is a blistering agent of blister beetles and has a long history in traditional medicine. The bioactive compound from the blister beetles, *Mylabris cichorii* collected from Karbi Anglong area of Assam, India, was isolated and characterized as cantharidin which showed potent antitumor activity against Ehrlich ascites carcinoma (EAC) and Dalton's lymphoma (DL). Cantharidin (i.p., 0.5 mg/kg/day) treatment of tumor-bearing mice showed an increase in life span (ILS ~82-87%). Cantharidin treatment induced apoptosis in tumor cells and depicted typical apoptotic morphology including chromatin condensation and plasma membrane blebbing. Flow cytometry analysis also corroborates the cantharidin-mediated induction of apoptosis in tumor cells, as there was significant increase in sub-G0 phase cells and simultaneous decrease in G2/M phase. The treatment also caused a significant decrease in mitochondrial cytochrome c and simultaneous increase in cytosolic cytochrome c which ultimately activates caspase 9 and 3 to augment apoptotic pathway. The tumor-bearing mice treated with cantharidin showed histopathological abnormality in kidney, liver and testis. The treatment caused glomerular and tubular damage in kidney while liver showed distorted sinusoids and hepatic necrosis. The observed increase in the activity/level of marker enzymes/molecules used for liver function test (LFT) and renal function test (RFT) also support the development of cantharidin-induced toxicity in these tissues. Testes depicted some seminiferous tubules with discontinuous and disorganized epithelium.

However, further study on the effect of cantharidin on human cancers may also be examined to be used alone or in combination to boost its clinical uses.

Biography

S. B. Prasad completed his Ph.D. in the research field of cisplatin's effect on the murine malignant cells in 1981-82 from Banaras Hindu University and presently is the Professor at North-Eastern Hill University, Shillong. He worked at MD Anderson cancer centre, USA for one year during 1993-94 under Government of India fellowship. His research interest is to study the anticancer activity and toxicity of various anticancer drugs as well as some plants and blister beetles in murine malignant tumor model which have resulted more than 60 research papers in the journals of international repute and 8 Ph.D. students under his supervision.

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