

EFFECTS OF COMBINATIONS OF PROTECTIVE COMPOUNDS ON RADIATION INJURY.

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This study was conducted to ascertain the ability of various radioprotective compounds given singly and in combination prior to 400 r of x-ray to decrease radiation-induced changes in adenosine triphosphatase of spleen and thymus glands and acetylcholinesterase activity of the small intestine of rats. The protective effects were measured as per cent dose reduction based on a direct relationship between dose of radiation and magnitude of enzyme alterations. Thirty-day survival studies with normally lethal doses of x-ray were performed to correlate effects measured enzymatically with survival. Combination of 2-aminoethylisothiuronium (AET) (150 mg/kg) plus hydroxylamine (60 mg/kg) provided greater protection as measured enzymatically than either compound given singly and permitted 30-day survival of all of 10 rats given 850 r and 6 of 10 given 1000 r. AET alone prevented mortality of 2 of 5 rats and hydroxylamine failed to protect against lethality from 850 r. Similar enhancement of protection was obtained with the combination of hydroxylamine (75 mg./kg) with reduced glutathione (900 mg/kg) or cysteine (1000 mg/kg). The results of this study indicate that radioprotective agents with apparently different modes of action provide additive protection without additive toxic effects.

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