

P R E F A C E

The laboratory of animal physiology, Department of Zoology, Shivaji University, Kolhapur (Maharashtra), India has been actively engaged in extensive work on uranyl nitrate toxicity. There is an extensive data available on uranyl nitrate toxicity and experimental induced acute renal failure, and as can be judged from the literature, Several research papers have been published in various international journals mainly on the behaviour and physical response of the animal to uranyl nitrate and possibility of acquisition of tolerance to uranyl nitrate, Lipid content of the blood of uranyl nitrate treated animals, behaviour of lipolytic alterations during uranyl nitrate induced acute renal failure; protective efficacy of dithiothreitol in experimental acute renal failure and its effects on hematological profile in uranyl nitrate induced acute toxicity, the response of red blood corpuscles to the toxic effect of uranyl nitrate on the behaviour of red cells.

Uranyl nitrate being widely used in industries, has become a target of several investigators. It has been clearly shown that these rare earth compounds affects the morphology and ultrastructure of several target organs like kidney and liver in particular. In this regard extensive biochemical data on organs like kidney, liver, brain and

adipose tissue has been published from our laboratory. This include mainly the behavioural and physical study of the animal after uranyl nitrate administration and possibility of acquisition of tolerance to uranyl nitrate. Lipid content of blood after uranyl nitrate administration, behaviour of lipolytic enzymes in kidney, liver and brain in response to uranyl nitrate administration; pathophysiology of kidney liver brain etc.

Lipid have been studied in greater details in order to have a definite idea about the lipid interaction during uranyl nitrate induced acute renal failure. A good part of studies have been directed towards understanding the etiological significance of sequential biochemical alterations that intervene during uranyl nitrate induced acute renal failure. Blood being the first and foremost media that is exposed to the toxic compounds. The effect of toxin at blood carpuscular level may further help in the diagnostic therapy of uranyl nitrate induced acute renal failure or similar pathophysiological condition in human beings. To get clearout insight into uranyl nitrate toxicity and the behaviour of red blood cells under toxic effect of uranyl nitrate a detailed investigation of the causes of structural alterations in red cells. Peticularly in relation to changes in red cell membrane lipids during uranyl nitrate induced

toxicity is felt inevitable and hence desirable. It is through the present dissertation for the first time that changes in red cell membrane lipids following uranyl nitrate toxicity is being brought to light; and has been reported in the present dissertation.

The present dissertation is divided into Four Chapters, with concluding chapter on general discussion. The First-Chapter gives a detailed and critical account of the existing literature on uranyl nitrate toxicity and effect of uranyl nitrate on blood in general. Red cell membrane lipid components and hematology of rat. It also gives the reasons that led to the present investigation without line of the plan of present investigation. The Second Chapter describes the detailed materials and methods employed in the present investigation. Chapter Three describes the effects of nephrotoxic anemia on the various hematological parameters as well as levels of the various lipid constituents of the red cell membrane in various phases of toxicity. The Last Chapter deals with the general discussion and concluding remarks on the observed facts with reference to the alterations in the cholesterol and phospholipids of red cell membrane and the physiology of nephrotoxic anemia.

The present investigation opens several avenues for the further research in the area of heavy metal toxicity and structure and functions of the cell membrane particularly with reference to lipid components. Some ideas regarding these aspects has been given at the end of the last chapter of the dissertation.

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