HYPOLIPIDEMIC EFFECT OF PROPANE-1, 2-DIOL ON THE MORPHOLOGY OF RAT ERYTHROCYTES

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ABSTRACT

Functional impairment of the erythrocytes could be attributed to the alterations in the membrane lipids composition leading to morphological changes. Propane-1, 2-diol ingestion to male adult rats at a dose level of 284 µl per 100 gm. body weight for 30 days has been shown to deplete the membrane cholesterol and phospholipids. This led to the changes in the red cell morphology as visualized under Electron microscope.

INTRODUCTION

The architecture of the red cell membrane is regulated mainly by the composition of lipids and proteins, Kirby & Green, (1980). The exposure to a great variety of amphillic agents in vitro induces the formation of spiculated or spurred cells, Robins & Miller, (1974) and Vatsala & Singh, (1980). Both depletion and repletion of cholesterol has an effect on membrane surface and caused a change in the shape of red cells. Studies with Propane-1, 2-diol (PG), a widely used solvent in drug, pharmaceutics and food industry showed that this solvent at a dose level of 284 µl in water per 100 gm. body weight to adult male albino rats for 30 days, caused significant lowering of plasma and blood lipids, Amma et al., (1978). This observation led us to study the effect of ingestion of this solvent on the red cell morphology and membrane lipids.

MATERIALS AND METHODS

Normal adult male albino rats were divided into two groups of six animals each. In addition to standard laboratory diet and water *ad libtum*, control group was given orally 1 ml of distilled water and test group was given 284 µl of Propane-1, 2-diol (PG) in water for 30 days. On the 31st day, fasting blood was taken from optical vein. The blood was centrifuged, erythrocytes were separated and washed thrice with 0.155 M cold saline. An aliquot of the washed cells was used to prepare erythrocyte membranes by the method of Cilive & Ozand (1972) using Tris—HCl buffer (0.01 M, pH 7.2). Membrane lipids were extracted by the method of Floch (1957). Membrane total lipids were estimated by the procedures of Zlatkis et al (1953); Fiske and Subba Row (1925) and Frings (1972) respectively. The other parts of the erythrocytes was treated with 2.5% glutaraldehyde buffered in 0.1 M Cacodylate buffer (pH 7.2) at 4°C for 3 hours and then was fixed in 1% osmium tetroxide buffered with veronal-acetic acid buffer (pH 7.4), by the method of Glauert (1974). The scanning of erythrocytes was done

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