2. Aim of the Present Investigation

Upon reviewing literature it is revealed that, in normal healthy condition, erythrocytes maintain a delicate balance between the oxidative stress to the membrane and its antioxidative defence system to counteract the oxidative treat. The oxidative threat to the membrane arises due to the formation of superoxide and hydroxyl radicals within the membrane. These radicals may bring about oxidative alteration of structure of membrane lipids following lipid peroxidation, which in turn might affect other membrane and cellular components. This might affect also haem synthesis and associated enzyme activities. The protective system in erythrocytes against such peroxidative reactions include various antioxidant enzymes, such as, superoxide dismutase, catalase, glutathione peroxidase and glutathione reductase. On the other hand, studies (Ohtsuka et al., 1994; Ait-Boulahansen et al., 1993) demonstrated that heat stress induces oxidative stress in the body. Further, it is known that ascorbic acid plays a key role in the modulation of glutathione oxidase-reductase system. Any influence on this system will accordingly modulate oxidative reaction in erythrocytes. Thus, the membrane stability may also depend on ascorbic acid status of the membrane. The lipid status of the erythrocyte membrane and its peroxidation may be other contributory factors for its stability. In addition, dietary protein level is also known to have profound influence on antioxidant system and membrane composition and stability.

Accordingly, the aim of the present investigation is to study the effect in vivo of heat stress on biochemical changes of erythrocyte membrane in terms of ascorbic acid, protein and lipid status, lipid peroxidation, glutathione metabolism and the activities of membrane bound and other protective enzyme systems on dietary protein adequacy and inadequacy. It is also intended to note whether ascorbic acid supplementation has any protective effects against heat-induced membrane changes.