

Thesis Title The Comparative Study of Signs and Symptoms in
 a Group of People Who Work in Hot Environments
 after the Compensation of Sugar-Salt and Water

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ABSTRACT

This research study aims to compare the signs and symptoms of subjects who compensate different portions of sugar-salt and water. A field study was set up to observe changes of plasma glucose, serum electrolytes, vital signs, body fluid balance, incidence of heat stress symptoms and fatigue index. A number of 108 acclimatized military personnel were divided into 3 groups i.e. 36 for each group, the first group (G1) drank 850 ml. of water, the second (G2) drank 1,700 ml. of water and the third drank 1,700 ml. of water added with 56 g. of sugar and 1,800 mg. of salt. The subjects were all assigned to exercise in outdoor field with metabolic rate at 150 Kcal/m²/hr for 1 hour and 20 minutes.

The study revealed that there were no change in either plasma glucose or serum chloride. There was significant increase in serum potassium, but serum bicarbonate significantly decreased. The levels of sodium, bicarbonate and osmolality in serum of G1 were significant different from G2 and G3. It could be explained that the compensation of sugar-salt gave no effects on changes of plasma glucose and serum electrolytes. The different portion of water compensation gave some changes on level of serum sodium, bicarbonate and osmolality. Serum sodium and osmolality in G1 were significantly higher than those of G2 and G3. This is indicated that an adequate water replacement, 1,700 ml. (figured out by P₄SR) could maintain body fluid balance. The physiological response in all groups were found that respiration rate and pulse rate increased significantly. In G1 the systolic blood pressure decreased but not in G2 and G3. It is suggested that the different portion of water replacement demonstrated certain effects on the circulatory system.

It is concluded that optimal water compensation in acclimatized persons with metabolic rate at 150 Kcal/m²/hr in hot environment could regulate body fluid balance and prevent from circulatory strain. In addition it is suggested that the P₄SR index can be introduced for calculation of optimal water compensation.