ABSTRACT

Aim: To examine the comparative effect of fluids and playing surfaces on selected biochemical and physiological variables during simulated tennis match at high temperature.

Method: Ten university level male tennis players, age ranging between 18 to 28 years with (Mean ± SD; Age 22.02 ± 2.35 years), from Lakshmibai National Institute of Physical Education, Gwalior were purposively selected. The training age of the subjects was 3.8 ± 2.25 years. Each subject underwent each treatment of fluids and playing surfaces during simulated tennis match. The variables selected in the study were blood lactate, oral body temperature, sweat rate, blood glucose, serum potassium and serum sodium. Within subjects 2 X 4 Factorial design was adopted for the study. Before the administration of simulated tennis match experimental protocol, participants had taken rest for 1 hour and they had consumed 200 ml of water in every 15 minutes, followed by simulated tennis match experimental protocol, which was played with the help of ball machine, which had predetermined set protocol. Immediately after the simulated tennis match, posttest was taken. The test was conducted on both the surfaces i.e. hard and clay at high temperatures. The difference between two treatment conditions of one particular subject was in between 5 to 7 days. Fluid Supplementation: water (1800 ml), carbohydrate drink(17.5 grams per 100 ml of water) total 1800 ml, electrolyte drink (21.8 grams per litre of water) total 1800 ml and sports drink (1800 ml) was given to them during 90 minutes simulated tennis match.

Statistical Technique: Descriptive statistics and Repeated measures design with two factors (within-within) i.e. two way repeated measures Analysis of Variance (within within) was employed. In case of significant main effect result, bonferroni correction for multiple comparisons was employed, to find the mean difference among the groups. In case of significant interaction effect, one-way repeated measures ANOVA’s was employed and the level of significance was 0.05.

Results: There was a significant effect of playing surfaces on oral body temperature (P=0.00), sweat rate (P=0.00) and blood lactate (P=0.022) where hard surface was
significantly more in all three variables than clay surface. There was a significant effect of fluids on oral body temperature (P=0.00), sweat rate (P=0.00), blood lactate (P=0.002), blood glucose (P=0.00), serum sodium (P=0.001), and serum potassium (P=0.001) where sports drink was significantly better than electrolyte drink followed by carbohydrate drink and at last water.

There was a significant interaction between playing surfaces and fluids on sweat rate (P=0.016).

**Conclusions:** Sports drink is most preferable drink on hard surface and clay surface to elevate the serum sodium level, serum potassium level, sweat rate and blood glucose, and reduces the blood lactate and oral body temperature followed by electrolyte drink, carbohydrate drink and water, respectively. Sports drink and electrolyte drink both are most preferable drink on clay surface to elevate the sweat rate followed by carbohydrate drink and water. If intensity, duration and density are same on both the surfaces at high temperature then hard surface elevates oral body temperature, blood lactate and sweat rate more than the clay surface.