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REVIEW ARTICLE

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A Study on Body Heat and Perspiration of Volleyball Player before and after the Match

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INTRODUCTION:-

Competitive sports performance of the sportsmen depends upon physical fitness, technique based upon scientific principles, scientific training programmer, diet etc. but the various environmental conditions like heat, cold, altitude and humidity also have a tremendous influence on the performance of the sportsmen.

No single temperature level can be considered to be normal, for measurement on many normal persons have shown a range of normal temperature from approximately 97^0 C to 99^0 C, when measured by rectum, approximately 10^0 F greater is then the oral temperature. The average normal body temperature is generally considered to be 98 .6^0 F (37 ^{0}C) when measured orally and approximately 10^0 F or 60^0 C higher when measured rectal. The body temperature varies somewhat with the exercise and with extremes of temperature of the surroundings, because the temperature regulatory mechanisms are not 100% effective.

When excessive heat is produced in the body by strenuous exercise, the rectal temperature can rise to as high as 101^0 to 104 ^{0} F. The ability to sense and regulate body temperature is a key feature of human survival. A deviation of ± 3.5°C from the resting temperature of 37°C can result in physiological impairments and fatality. When the exercise is performed under comfortable environmental conditions, the only problem is the elimination of excess heat of the metabolism. It appears that the rise in body temperature in exercise is the result of a “resetting” of the hypothalamic “thermostat” at a higher level just as in clinical fever. In fact, height and Keating 3 have suggested that the elevation of the set point for body temperature regulation after prolonged exercise is due to the liberation of pyrogens from damaged cells, especially in the muscles and kidneys.

The mobilization of neutrophilic leucocytes in to the circulation (well known to occur in exercise) would make the cells available for phagocytes of damaged tissue cells with release of pyrogens, so that the heat loss balances heat production at a higher body temperature. Furthermore, since most of the excess heat is produced in the active muscles, their temperature is certainly greater than that of the whole body, as reflected in the oral and rectal temperatures. A rise in body temperature that is well tolerated by an exercising man may cause; On those occasions where heat transfer to the environment is of minimal value, the player may experience a considerable rise in body temperature which states that, heat produced through metabolic activity (M) and work (W), which is not lost to the environment through radiation (R), convection (C) or evaporation (E), results in some heat storage (S). This heat storage causes a rise in tissue temperature, with a concomitant rise in deep body temperature. There is little evidence of mental performance impairment through such a rise in deep body temperature.

However, it has been suggested by that many motor skills, vital in racquet sport performance (e.g. tracking), may suffer decrement as body temperature deviates from normal sedentary values. In addition, heat exhaustion may range from mild fatigue to complete collapse, dependent on exercise level and extant environmental conditions. Such fatigue from hyperthermia may be an additional physiological factor which limits performance efficiency.

METHODS

Fourteen volleyball players with age ranging from 17 to 23 years. All were university level sportsman from LNIPE, Gwalior,Mahatma Gandhi University Kottayam & SRM Univeristy Chenni , were selected as subjects for the study. The data were collected for each variable by administering their respective tests. The weight and oral temperature of each subject was taken before the start of the volleyball match and again the weight and oral temperature was taken after the match to assess the amount of sweat loss and rise in temperature during the volleyball match, thermometer for temperature and body weighing method for sweat loss was used (AIS Nutrition Department).the analysis of data was realized using

the statistical program SPSS v 17for statistical analysis paired't' test was employed.

RESULTS

The data were collected and analyzed in order to draw a conclusion on influence on body temperature and also on sweat, and the scores are given bellow.

Table-1

Descriptive Statistics of Volleyball Players on Sweat Rate and on Body Temperature

N.	Variables	Mean		Standard deviation	
	data	pre	post	pre	post
14	Sweat loss	64.1429	62.5000	6.66630	6.93653
14	Body temperature	36.7557	38.0786	0.40910	0.55142

Table- 1 reveals that mean and standard deviation of Sweat rate for pre data is 64.1429, +6.66630, and for post data is 62.5000 +6.93653 and for body temperature mean and standard deviation for pre data i36.7557, +0.40910, and for post data is38.0786, +0.55142respectively

The Mean Scores of Pre and Post Data on Body Temperature and Sweat Loss Fluid Loss in Water and Fluid Loss on Land Has Been Represented Graphically in Figure No 1

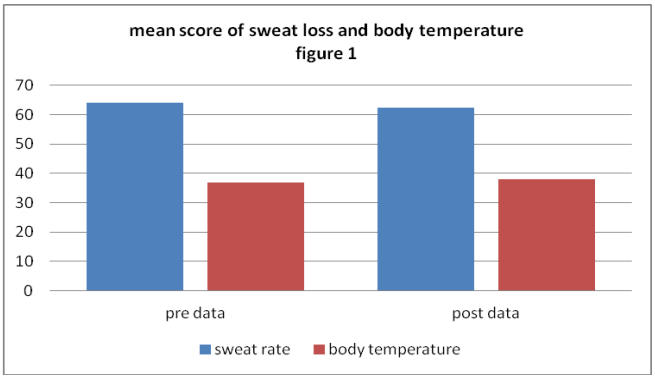

Table 2

Comparison of Mean Difference of Sweat Rate between Pre and Post Data among Volleyball Players

Df	Mean difference	Std.error difference	T	Significance
13	1.64286	.49725	12.362	0.000

It is evident from Table no. 2 that obtained p- value (0.000) is lesser than 0.05 thus indicating that there is significance difference among volleyball players before and after the match in term of sweat rate.

Table 3

Comparison of Mean Difference of Body Temperature between Pre and Post Data among Volleyball Players

Df	Mean difference	Std.error difference	T	Significance
13	-1.32286	.56918	-8.696	0.000

It is evident from Table no. 3 that obtained p- value (0.000) is lesser than 0.05 thus indicating that there is significance difference among volleyball players before and after the match in term of body temperature.

FINDINGS AND CONCLUSIONS

The analysis of data clearly reveals that there were significant differences in body temperature between before the match and after the match. And the analysis of data also clearly reveals that there was significant difference in sweating between before and after the match. Though skin temperature would have increased during the early part of the match, after the match it came down to the same level as before the match. It may be due to the evaporative sweating which cooled down the surface temperature of the body. The skin temperatures are more related to the ambient temperature.

Increase in body temperature, that is core temperature during muscular work is associated with increase in metabolic rate since the mechanical efficiency vary from 0.25 percent depending upon the work at least 75 percent of the energy produced is converted in to heat , which causes an increase in oral temperature. Maron, Wagner and Horvath have shown increase in core temperature in their study which was conducted on marathon runners. The analysis of the data collected on sweating clearly reveals that the group lost significant amount of sweat, which is related to increase in body temperature during muscular work under such conditions blood vessels of the skin dilates and more blood is directed to the periphery. The sweat glands of the skin are then activated and sweat is absorbed from blood and excreted at larger amount.

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