



A STUDY ON SELECTED BIOCHEMICAL CHANGES OF HUMAN RENAL EXCRETORY FLUID AMONG FOOTBALL PLAYERS

Dr. Sandeep Sunny*, Azhar P S & Lennin Thomas*****

* HOD, Department of Physical Education, Sacred Heart College, Thevara, Kerala

** Assistant Professor, Department of Physical Education, Sacred Heart College, Thevara, Kerala

*** PET, St. Marys Higher Secondary School, Aluva, Kerala

Cite This Article: Dr. Sandeep Sunny, Azhar P S & Lennin Thomas, "A Study on Selected Biochemical Changes of Human Renal Excretory Fluid Among Football Players", International Journal of Interdisciplinary Research in Arts and Humanities, Volume 8, Issue 1, Page Number 110-114, 2023.

Abstract:

The purpose of the study was to analyze the selected Biochemical changes in urine before and after the physical activity of football players in the Sacred Heart College Thevara. There were 10 male football players participated in the study. To measure the biochemical in urine such as ketone, Ph, Specific gravity and Protein, Urine strip test method was used. To statistically examine the data related to selected variables ANOVA was performed using SPSS. The study revealed that there is a significant difference in terms of ketone, Ph, Specific gravity and Protein between before and after the physical activity of football players.

Introduction:

The term "physical activity" should not be mistaken with "exercise". Exercise, is a subcategory of physical activity that is planned, structured, repetitive, and purposeful in the sense that the improvement or maintenance of one or more components of physical fitness is the objective. Physical activity includes exercise as well as other activities which involve bodily movement and are done as part of playing, working, active transportation, house chores and recreational activities. The human body has a complex system for balancing the volume and composition of body fluids. It consists of skeletal, muscular, circulatory, reproductive, digestive, nervous, respiratory, urinary and excretory system. The circulatory system circulates blood which transport nutrients, oxygen, hormones, carbon dioxide, and waste materials. There are four important tracts which eliminates the body waste. They are the urinary tract which is the main system of elimination, the lungs eliminate the carbon-dioxide, the digestive tract eliminates indigestible solids & bacteria, the sweat glands eliminate excess heat & salt. So the researcher feels to find out the effect of physical workout in excretory system of football players, to find out the variations through the urine analysis because urine contains lot of chemical to identify the proper functioning of human excretory system.

Statement of the Problem:

The purpose of the study was to analyze the selected Biochemical changes in urine before and after the physical activity of football players.

Delimitation:

- The study was delimited to 10 football players.
- The age ranged between 18 and 25 years.
- The study was delimited to only urine samples.
- The subject was restricted to compete in district, state, and university level.
- The samples sizes were not large enough for wide generalizations.

Limitation:

- The nutritional status of the subjects was considered limitation to the study.
- The socio-economic status of the subjects was considered as a limitation for the study.
- Factors like personal habits, daily routine activities, environment, economic conditions and life styles of the sample group members were not taken into consideration for this study.
- The general mood of the sample and environmental conditions at the time of performing the test might differ from the actual context, and this may be considered as another limitation of this study.
- Psychological factors were not taken into consideration at the time of participating in the activity, and this may be considered as another limitation of this study.

Objectives of the Study:

Present study is based upon the following objectives

- To compare the biochemical changes in urinary chemicals of the Pre and Posttest of football players.
- To find out the effectiveness of ketone level of football players.

Hypothesis:

Based on the above objectives following hypothesis were formulated

- It is hypothesized that there will be a significant difference in the Pre and Posttest of urinary chemicals of football players.
- It is hypothesized that there will be a significant difference in the ketone level of football players.

Significance of the Study:

- The study will help to know the Biochemical changes in the urine among football players
- The study will be help to prepare the fitness program for the football players.
- The study will help to monitor the health risk factors of football players.

Procedure:

The study was to investigate the selected biochemical changes in urine among football players before and after the physical activity. In this study the bio chemicals of urine such as Protein, Ph, Ketone and specific gravity were measured.

Selection of the Subjects:

For the purpose of study a total of 10 male football players were selected randomly from the Sacred Heart College Thevara. The age range was 18 to 25 years.

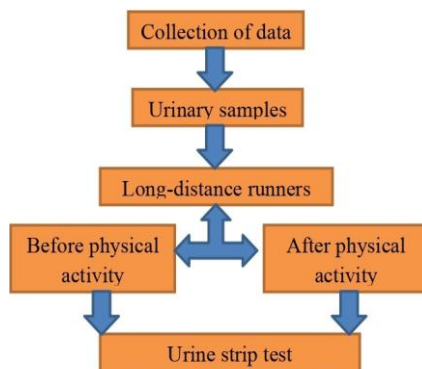
Selection of Variables:

Variables are the conditions or characteristics that the experimenter manipulates, controls or observes. They are concepts that serve a particular purpose in educational research. In the present study the urine samples of the athletes before and after the physical activity were collected and following variables were tested with urine strip test method.

- Protein
- Ph
- Ketones
- Specific Gravity

Collection of Data:

For the present study the investigator collected the urinary samples of 10 football players before and after the physical activity. Total of 20 urine samples were collected and separated in a different container. For the collection of data the investigator first collected the urine samples before the physical activity of 10 male football players and is separated in a different container with name slip. After the collection the investigator sends their subjects for 45 minutes continues running. During the time of running the investigator tested the urine samples with urine strip test method of the 10 subjects and recorded the data's such as urine protein, Ph, ketone and specific gravity. After the completion of 45 minutes running the investigator collected the urine samples 10 male football players and is separated in a different container with name slip. Finally these samples were tested by using urine strip test method and again recorded the data's such as urine protein, Ph, ketone and specific gravity. Finally the recorded results were analyzed with statistical techniques like Analysis of variance (ANOVA).



Analysis of Data and Results of the Study:

The major objective of the present study was to analyze the biochemical changes in human renal excretory fluid that is urine in football players before and after their physical activity. Following urine biochemical such as Protein, Ph., Ketone and Specific gravity were tested by urine strips. The statistical techniques adopted were Arithmetic mean, standard deviation and for the comparison of pre and posttests ANOVA was used. The data collected for the present study were analyzed with a view to throwing light on the objectives of this study. The analysis and interpretation of data are presented below. To test the hypothesis the level of significance was set at 0.05 levels.

Table 1: Computation of mean and standard deviation of Pretest and post test scores on Urine biochemical of the football players

Variables	10 Football Players			
	Pre Test		Post Test	
	AM	SD	AM	SD
Protein	12.7	2.49	20	4.71
PH	6.2	0.25	5.4	0.51

Ketones	4.5	0.96	13.5	2.41
Specific Gravity	1.009	0.0052	1.024	0.005

Table 1 shows that mean and standard deviation of protein level in pretest was 12.7 and 2.49 and in posttest was 20 and 4.71 respectively. Mean and standard deviation of Ph. level in pretest was 6.2 and 0.25 and in posttest was 5.4 and 0.51 respectively. Mean and standard deviation of Ketone level in pretest was 4.5 and 0.96 and in posttest was 13.5 and 2.41 respectively. Mean and standard deviation of Specific gravity level in pretest was 1.009 and 0.0052 and in posttest was 1.024 and 0.005 respectively.

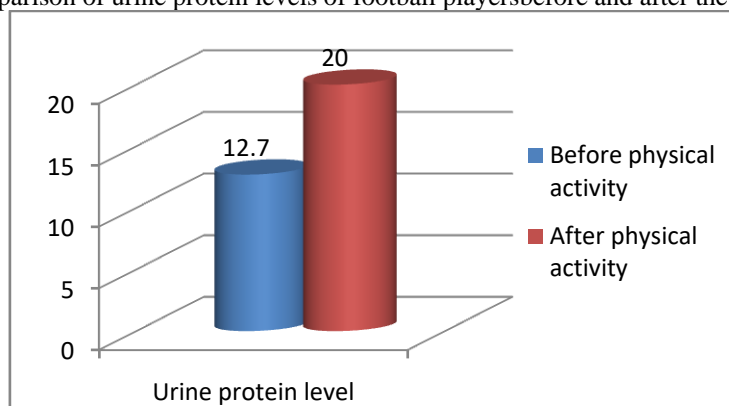
Table 2: Summary of ANOVA on urine protein level of football players before and after the physical activity

Source of Variance	Sum of Squares	Df	Mean Sum of Squares	F Cal	F Table
Between Groups	266.45	1	266.45	18.73	4.41
Within Groups	256.1	18	14.22		
Total	522.55	19			

The F-ratio value is 18.73. The p-value is .0004. The result is significant at $p < .05$.

The table 2 reveals that the calculated F – ratio with degree of freedom (1, 18) is 18.73 is greater than the F table value with degree of freedom (1, 18) is 4.41 at 0.05 level of significance. Hence we conclude that there is a significant difference exists between urine protein levels before and after the physical activity of football players.

Figure 1: Comparison of urine protein levels of football players before and after the physical activity



Note. The above graph shows that the mean score of urine protein level of after the physical activity is greater than urine protein level before the physical activity.

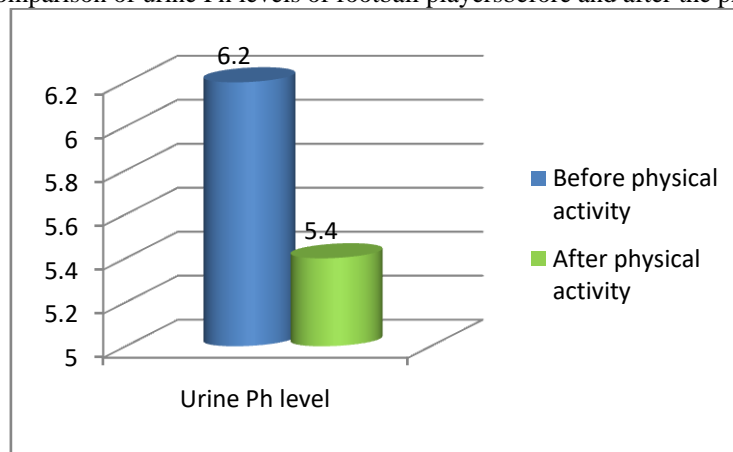
Table 3: Summary of ANOVA on urine Ph. level of football players before and after physical activity

Source of Variance	Sum of Squares	df	Mean Sum of Squares	F Cal	F Table
Between Groups	3.2	1	3.2	19.20	4.41
Within Groups	3	18	0.1667		
Total	6.2	19			

The F-ratio value is 19.20. The p-value is $< .0003$. The result is significant at $p < .05$.

The table 3 reveals that the calculated F – ratio with degree of freedom (1, 18) is 19.20 is greater than the F table value with degree of freedom (1, 18) is 4.41 at 0.05 level of significance. Hence we conclude that there is a significant difference exists between urine Ph levels before and after the physical activity of football players.

Figure 2: Comparison of urine Ph levels of football players before and after the physical activity



Note. The above graph shows that the mean score of urine Ph level of after the physical activity is less than the urine Ph level before the physical activity.

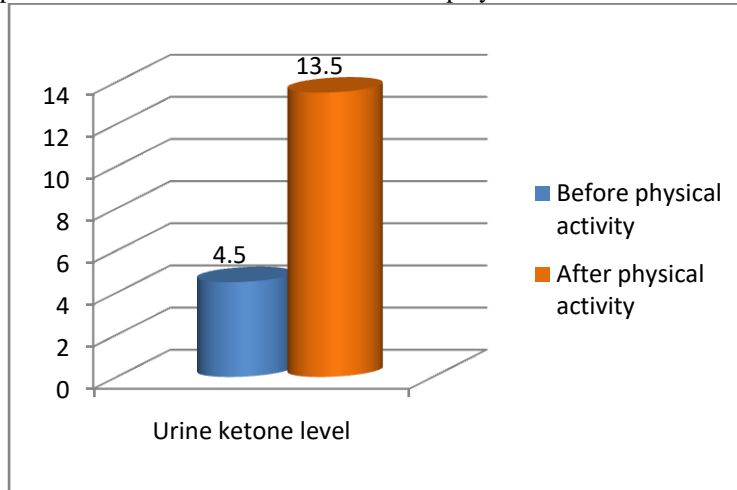
Table 4: Summary of ANOVA on urine ketone level of football players before and after physical activity

Source of Variance	Sum of Squares	df	Mean Sum of Squares	F Cal	F Table
Between Groups	405	1	405	119.50	4.41
Within Groups	61	18	3.38		
Total	466	19			

The F-ratio value is 119.50. The p-value is $< .00001$. The result is significant at $p < .05$.

The table 4 reveals that the calculated F – ratio with degree of freedom (1, 18) is 119.50 is greater than the F table value with degree of freedom (1, 18) is 4.41 at 0.05 level of significance. Hence we conclude that there is a significant difference exists between urine Ketone levels before and after the physical activity of football players.

Figure 3: Comparison of urine Ketone levels of football players before and after the physical activity



Note. The above graph shows that the mean score of urine Ketone level of after the physical activity is Greater than the urine Ketone level before the physical activity.

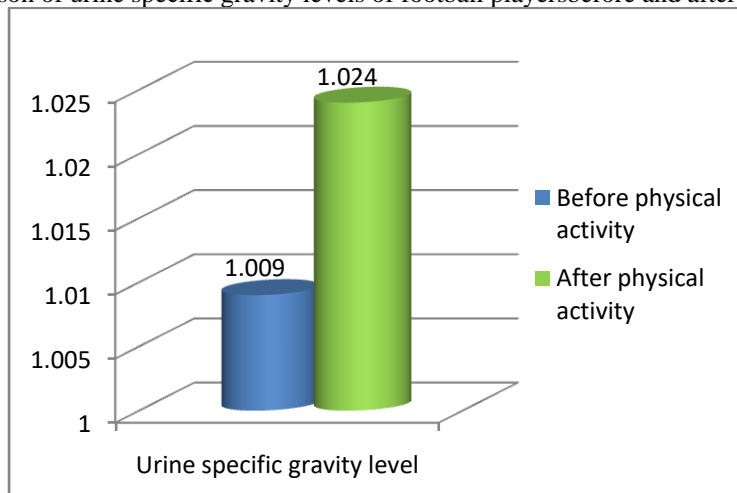
Table 5: Summary of ANOVA on urine specific gravity of football players before and after physical activity

Source of Variance	Sum of Squares	Df	Mean Sum of Squares	F Cal	F Table
Between Groups	0.0012	1	0.0012	42.85	4.41
Within Groups	0.0005	18	0.000028		
Total	0.0017	19			

The F-ratio value is 42.85. The p-value is $.00001$. The result is significant at $p < .05$.

The table 5 reveals that the calculated F – ratio with degree of freedom (1, 18) is 42.85 is greater than the F table value with degree of freedom (1, 18) is 4.41 at 0.05 level of significance. Hence we conclude that there is a significant difference exists between urine specific gravity levels before and after the physical activity of football players

Figure 4: Comparison of urine specific gravity levels of football players before and after the physical activity



Note. The above graph shows that the mean score of urine specific gravity level of after the physical activity is Greater than the urine specific gravity level before the physical activity.

Summary, Conclusions and Recommendations:

To achieve the purpose of the study the investigator selected 10 football players from Sacred Heart College Thevara. After the selection of subject's investigator collected urine samples of 10 football players before and after the 45 minutes running. The investigator first tested the urine samples before running by using urine strip test method and he collected the data such as protein, ketone, Ph, specific gravity of urine. Then subjects were administrated for 45 minutes running and finally collected the urine and tested with same method and obtained the post scores. The collected data was statistically tested by using ANOVA method. The level of significance was fixed at 0.05 level of confidence.

Conclusions:

The following conclusions were drawn from the analysis of the data

- The result shows that there was a significant difference exists between urine protein levels before and after the physical activity of football players.
- The study shows that there was a significant difference exists between urine Ph. levels before and after the physical activity of football players.
- The result of the study shows that there was a significant difference exists between urine Ketone levels before and after the physical activity of football players.
- The study reveals that there was a significant difference exists between urine specific gravity levels before and after the physical activity of football players.

Recommendations:

In the light of the conclusions drawn, the following recommendations are made

- A study of similar nature may be conducted for school boys
- Elite sports persons can be chosen as subjects for a similar study.
- Similar study may be conducted to international level of football players, and may be conducted to different sports and games.
- Similar study may be conducted to different environmental conditions.

References:

1. Rose, B., & Post, T. (2001). Clinical Physiology of Acid-Base and Electrolyte Disorders (pp.410-412).New York, McGraw- Hill.
2. Yaker, H., & Harrington, J (1995). Urinalysis and urine electrolytes in The Principles and Practice Of Nephrology. In H. Jacobson et al (Eds), (2nd ed., pp. 90-92). G. St. Louis, Mosby.
3. Arnett, T., &Spowage, R, (1996). Modulation of the resorptive activity of rat osteoclasts bySmall changes in extracellular pH near the physiological range. London.
4. Arnett, T. (2003). Regulation of bone cell function by acid-base balance. Proceedings of theNutrition Society. London.
5. Arnett, T., & Dempster, D. (1986). Effect of ph. on bone resorption by rat osteoclasts in vitro.Endocrinology. London.
6. Cairns, S. (2006). Lactic acid and exercise performance: Culprit or friend Sports Medicine. New Zealand.
7. Cook, M. (2008). The ultimate ph solution. NY: HarperCollins Publishers. New York,
8. Miles, B., Paton, A., & De Wardener, A. H. (1954). Maximum Urine Concentration.
9. British Medical Journal, vol 2, pp 901-905.
10. Feeney, D., Osborne, C., & Jessen, C. (1980). Effects of radiographic contrast media on results of urinalysis, with emphasis on alteration in specific gravity. Journal of the American Veterinary Medical Association, vol 176, pp1378-1381.
11. Dorner, K., Campos, R., &Bornsen, S. (1984). Further evaluation of the SG test strip for estimation of urinary osmolality. Journal of Clinical Chemistry and Clinical Biochemistry, vol 22, pp 419-425.
12. Astrug, A., Ilieva, E., &Dochev, D. (1976). Urine specific gravity and osmolality in hypertension patients with dehydration. VutreshniBolesti, vol 15, pp 46-52.
13. Dhama, K., Lathief, S., Samad, H., Chakraborty, S., Tiwari, R., Kumar, A., & Rahal, A. (2013).
14. Tumor necrosis factor as mediator of inflammatory diseases and its therapeutic targeting. Journal of Medical Sciences, 13(4), 226-235.
15. Gabay, C., & Kushner, I. (1999). Acute-phase proteins and other systemic responses to inflammation. New England Journal of Medicine, 11(340), 448-454.
16. Geiler, J., Buch, M., & McDermott, M. (2011). Anti-TNF treatment in rheumatoid arthritis. Current Pharmaceutical Design, (17), 3141-3154.
17. Gabay, C. (2006). Interleukin-6 and chronic inflammation. Arthritis Research and Therapy,8(2),1-6.
18. Forrest, I. (2012). Examining the relationship between diet-induced acidosis and cancer. Nutrition and Metabolism, 9(1), 72-82.