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Effect of Breathing Techniques on Selected Haematological Variables of Male Football Players

Abstract

The purpose of the study was to explore the effect of Breathing techniques on Selected Haematological Variables of male football Players. 20 male interuniversity football players, age ranged between 18-28 years, associated with different streams, studying in Banaras Hindu University were selected randomly for the present study. 60 minutes Breathing techniques was given to the subject for eight weeks. Red Blood Cells, Hemoglobin & Haematocrit were assessed with the help of pathologist from a laboratory. It was insured that the pathologist was well trained technicians and result was not affected due to incompetency of testing procedure. Pre and post test of selected Haematological Variables was conducted on all the male participants before and after 8 weeks Breathing techniques (Pranayama) practice such as Anulom- Vilom, and Om chanting for one hour for all working days of the week. The t-ratio was used to analyze the obtained data. The eight weeks Breathing technique practice had significant effect on Hemoglobin of male football Interuniversity players, whereas, insignificant effect was found in relation to Red Blood Cells & Haematocrit in the male intervarsity football players.

Keywords: Breathing Technique, Red Blood Cells, Hemoglobin, Haematocrit, Anulom-Vilom,

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Introduction

Meditation and Om chanting can be used to nurture and heal the body and mind. We should put in efforts to remain balanced and therefore cultivate inner strength. The best practice at this time is then yoga nidra and some gentle Breathing technique such as bhramari (humming bee breath), anulom vilom (alternate nostril breath), ujjayi (victorious breath) and deep breathing. Om Chanting will also be very beneficial. Blood has numerous functions in a healthy body. One of its primary tasks is to deliver oxygen and nutrients to the body's cells. Blood also distributes warmth to those regions that need it the most, wards off disease, and helps to filter harmful waste products such as carbon dioxide out of the body. Breathing technique is important not only for supplying fresh air or oxygen and strengthening the lungs but they have a direct effect on the brain and emotion. Asana gives physical health, meditation gives strength to soul but breathing technique gives mental health. It keeps the brain under conscious control. Deep breathing is very beneficial, especially Bhramari (Humming Bee Breath), Anulom vilom (Alternate Nostril Breathing), Ujjayi are all useful practices.

Football is especially a strength endurance oriented game. A football player needed an optimum amount of oxygen supply to perform well. It can also help one to deal with any muscular pain. The various components of blood each play a role. In humans, blood cells are produced by stem cells in the bone marrow. Once these cells develop, they are released into the bloodstream. Red blood cells deliver hemoglobin, which is the iron-bearing protein that makes the transportation of oxygen possible. Hemoglobin also gives human blood, and that of many other animals, its red colour. Haematocrit refers to the proportion of volume of red blood cells relative to the total volume of blood. The normal range of variables under present study is given in the Table – 1.

Table- 1
Normal Range of RBC, Hemoglobin and Haematocrit in Men & Women

S.No.	Haematological Variables	Normal Range in Males	Normal Range in Female
1.	Red Blood Cells	4.5-6.3 million/µL	4.2-5.5 million/µL
2.	Hemoglobin	14-18 g/dl	12-16 g/dl
3.	Haematocrit	40-54%	37-47%

The table-1 shows the normal range of RBC, Hemoglobin and Haematocrit in Men & Women which will be useful to all readers for the purpose of study in the future course during explanation of results of similar kind of studies. During the present course of pilot study, the investigator was trying to come across the outcomes of Breathing technique practicing for 8 weeks on the Hematological Variables i.e. Red Blood Cells, Hemoglobin & Haematocrit of male football Interuniversity players of Banaras Hindu University.

Objectives of the Study

1. To characterized the pre and post effect of 8 weeks Breathing technique practicing on selected haematological Variables i.e. Red Blood Cells, Hemoglobin & Haematocrit of Male Football Interuniversity Players.
2. To find out significant difference between pre and post- test of 8 weeks breathing technique practice on selected hematological Variables i.e. Red Blood Cells, Hemoglobin & Haematocrit of Male Football Interuniversity Players.

Research Methodology

Randomly 20 male interuniversity football players, age ranged between 18-28 years, associated with different streams, studying in Banaras Hindu University were selected for the present study. They were neither taking any kind of medications nor under any medical treatment. The subjects were informed about the study and the baseline assessments of study was performed before starting the Breathing technique (Anulom- Vilom, Ujjayi and Om recitation) sessions. Subjects were instructed about the Breathing technique session of 60 minutes per day for six day in a week for a period of 8 weeks. As there was only one group was involved into the practice thus, single group pre - test post- test design was used.

Procedure Applied for Data Collection

For the collection of Pre-data and Post data, the level of Red Blood Test, Hemoglobin & Haematocrit test was performed by a reputed pathological laboratory and their well trained technicians as per the direction & time given by the scholar. All the subjects received an explanation of nature and purpose of the study and gave their formal written consent to participate in the present study. Prior to obtain data, the subjects were asked to give completed self made questionnaire regarding their medical history, medications, which was prepared with the help of expert. Utmost care was also taken to obtain clinical based data regarding their health status to maintain research decorum. None of them were diagnosed clinically with Diabetes mellitus, Hypertension, Cardiovascular diseases or any other systemic disorders. Research scholar also made a request to all volunteers for not taking any kind of medication during study without prior information to the scholar. The purpose and methodology of the study was explained to all of them for their full cooperation. The relaxed mental condition of the subjects was prerequisite for appropriate results. The pre- treatment- data were taken just the day before of starting Breathing technique practices and the post- data were taken just the day after finishing 8 weeks breathing technique practices. All the recordings were done at morning time between 7am to 8 am to avoid any kind of diurnal variation.

Techniques used for intervention

The practice was started in the morning at 6:00 am with proper instructions to the subjects for their better understanding. Subjects were asked to sit in any comfortable meditative posture. Anulom - vilom breathing technique was practiced only after teaching them proper steps due to the kind of side effects which may occur like; hallucinations. Anuloma-viloma breathing is done by placing the right thumb on the right nostril, the right ring finger on the left nostril while all other fingers may be relaxed. The technique was performed with proper ratio of inhaling called 'Rechak' (inhale through the left nostril with the thumb closing the right nostril for a count of 04 seconds), holding of breath called 'Kumbhak' (for lower the chin closing the glottis and hold the breath for a count of 08 seconds) and exhaling of air from other side of nose i.e. right nostril called Poorak for 16 and repeat the same with alternate nostrils. 20 repetitions of Anulom- vilom is sufficient for the primary subjects who are not specialized in yog. The practice of breathing technique was followed by the "OM" chanting. Proper observation was made during the practice by the principal investigator.

Results & Findings

To find out significant effect of breathing practice of eight weeks by male Football Interuniversity players between pre and post test data, descriptive statistics was used. Whereas, to find out the significant difference between the means of two scores of pre & post values, independent t-test was applied and the results are presented in table - 2

Table-2
Effect of Breathing Practice in relation to Red Blood Cells

S.No.	Pre-Post RBC test	Mean	N	SD	r	t-Value
1.	Pre test RBC	4.6785	20	.53830	.167	1.223
2.	Post test RBC	4.8745	20	.57128		

* Significant at 0.05 level of significance at (df, 19) 2.093

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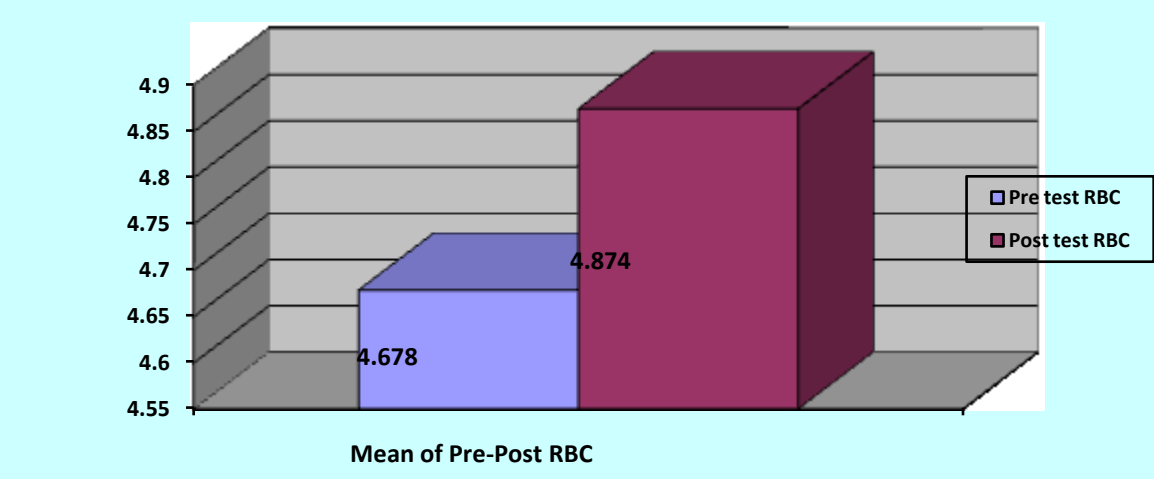
It is evident from the table number -1 that the computed t-value of Red Blood Cells was found 1.223 which is less than the tabulated t-value 2.093.Therefore, insignificant difference was found between pre test and post test of 8 weeks Breathing technique practice on Red Blood Cells of Male Football Interuniversity Players. The mean value of pre test of Red Blood Cells (4.6785) < post test of Red Blood Cells (4.8745).

Further, the Mean Value of Pre Test & Post Test of 8 weeks breathing technique Practice on Red Blood Cells of Male Football Interuniversity football Players are presented with the help of figure no. 1

Figure No. 1
Mean Value of Pre Test & Post Test of 8 weeks Breathing technique Practice on Red Blood Cells of Male Football Interuniversity Players



The above figure no.1 describes the pre test and post test 8 weeks breathing practice and the result of the pranayam (Anulom- Vilom) on the selected Hematological variable i.e. Red Blood Cell.

To find out whether there was any significant difference between pre and post effect of 8 weeks breathing technique practice on Hemoglobin (Hb) Male Football Interuniversity Players descriptive statistics and t-test was applied and results pertaining to the same are presented in the Table- 3.

Table-3
Effect of breathing Practice in relation to Hemoglobin

S No.	Pre-Post Hb test	Mean	N	SD	r	t-Value
1.	Pre test Hb	12.2850	20	1.13103	-.176	2.659*
2.	Post test Hb	13.3950	20	1.29958		

* Significant at 0.05 level of significance at (df, 19) 2.093

The computed t-value of Red Blood Cells was found 2.659 is greater than the tabulated t-value 2.093.Therefore significant difference was found between pre test and post test of 8 weeks breathing technique practice on Hemoglobin of Male Football Interuniversity Players. The mean value of pre test of Hemoglobin (12.2850) < post test of Hemoglobin (13.3950).

Further, the Mean Value of Pre Test & Post Test of 8 weeks breathing technique Practice on Hemoglobin of Male Football Interuniversity football Players are presented with the help of figure no. 2

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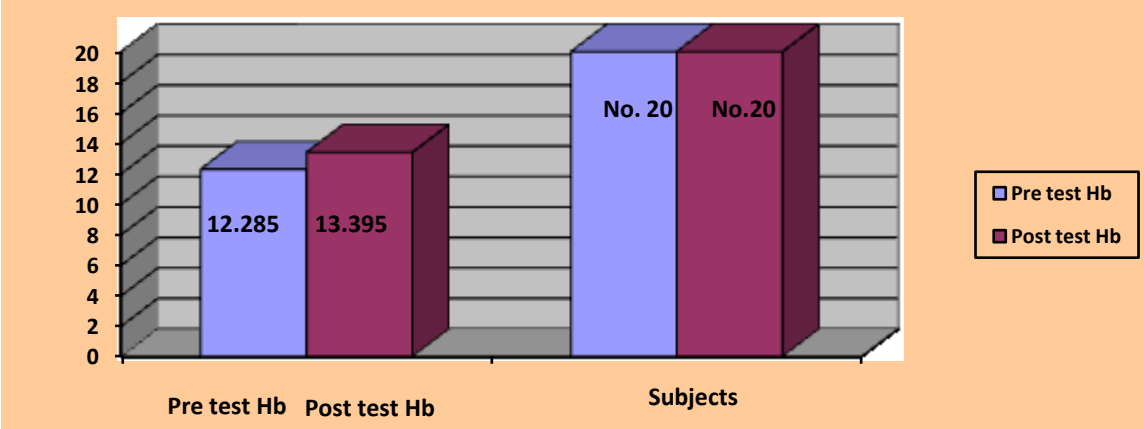
Figure No. 2
Mean Value of Pre Test & Post Test of 8 weeks breathing technique Practice on Hemoglobin of Male Football Interuniversity Players



The above figure no.2 describes the pre test and post test 8 weeks breathing practice and the result of the pranayam (Anulom- Vilom) on the selected Hematological variable i.e. Hemoglobin.

To find out whether there was any significant difference between pre and post effect of 8 weeks breathing technique practice on Haematocrit (Hc) of Male Football Interuniversity Players descriptive statistics and t-test was applied and the results pertaining to the same are presented in the table No.4

Table-4
Effect of breathing Practice in relation to Haematocrit

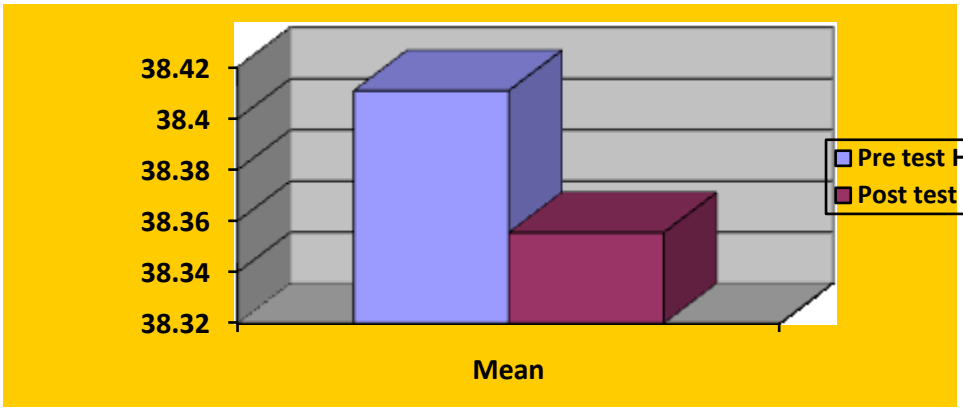
S No.	Pre-Post Hc test	Mean	N	SD	r	t-Value
1.	Pre test Hc	38.4110	20	3.30313	0.213	0.051
2.	Post test Hc	38.3555	20	4.40385		

* Significant at 0.05 level of significance

The computed t-value of Haematocrit was found 0.051 that is less than the tabulated t-value 2.093.Therefore insignificant difference was found between pre test and post test of 8 weeks breathing technique practice on Haematocrit of Male Football Interuniversity Players. The mean value of pre test of Haematocrit (38.4110) > post test of Haematocrit (38.3555).

Further, the Mean Value of Pre Test & Post Test of 8 weeks breathing technique Practice on Haematocrit of Male Football Interuniversity football Players are presented with the help of figure no. 3

Figure No. 3
Mean Value of Pre Test & Post Test of 8 weeks breathing technique Practice on Haematocrit of Male Football Interuniversity Players



The above figure no.3 describes the pre test and post test 8 weeks breathing practice and the result of the pranayam (Anulom- Vilom) on the selected Hematological variable i.e., Haematocrit.

Discussions of findings and Conclusions

To find out significant effect of breathing practice of eight weeks by male Football Interuniversity players between pre and post test data, descriptive statistics was used. Whereas, to find out the significant difference between the means of two scores of pre & post values, independent t-test was applied. The results of the study are presented above shown with the help of tables as well as figures for better understanding. Through breathing technique practices the supply of fresh air (oxygen) is supplied more to the lungs and strengthening the respiratory system. The result of better supply of oxygen may have resulted into better circulatory system thus, increase in hematological parameters to some extent. Better supply of blood (oxygenated blood) keeps the brain under conscious control due to alertness. The effect of eight week breathing practice enhances hemoglobin, RBC and Haematocrit as shown by the present study may be attributed to the enhanced conscious control of the brain which in turn develops the capacity of the lungs and there is some kind of internal chemical changes that occurs in our body and gives a positive effect. The studies found the similar results conducted by Verma, P. & Kapri, B.C. (2013) and Bhardwaj (**2012**). Through Breathing technique practices a sufficient amount of oxygen supplies in our body which causes the increased level of Hemoglobin as proved by the present study that significant difference was found in relation to Hemoglobin by taking pre and post blood test. The eight weeks Breathing technique practices puts a significant effect on Hemoglobin of Male Football Interuniversity Players, but insignificant effect was found in relation to Red Blood Cells & Haematocrit.

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