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Effect pranayama on haemoglobin of male school student

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Abstract

The aim of this study was to observe the effect of Pranayama on Hemoglobin of subjects with the age range 17 to 21 years. For this 30 male subjects were drawn from Degree College Varanasi, by using Simple Random Sampling. Pre-post data were collected before and after intervention of a Pranayama for 30 days by using Cyan methemoglobin method to determine the amount of hemoglobin in the blood. Since calculated value of t ($=3.212$) is greater than tabulated $t_{0.05}$ (29) ($=2.045$). It is concluded that Pranayama plays positive and significant role to enhance haemoglobin level of the subjects.

Keywords: Pranayama, hemoglobin, male school student

Introduction

Normally, optimal level of blood Haemoglobin is necessary for proper gases exchange among lungs and tissues and sound immunity. Hence, it was relevant to conduct this study to test the positive effects of Pranayama in blood Haemoglobin implied in the reviewed related literatures and to highlight its importance to maintain sound health. In Hatha Yoga Pradipika (2:7-10) and Gherand Samhita (5:32-44), the method of Pranayama is different than the technique adopted under this study. Pranayama has been accepted as an elementary and a cleansing practice to clean the subtle energy channels of bioplasmic body before practice of others (Kumbhakas). Some of the previous findings related to the effect of Yoga practices have been found with involvement of Bhogal, *et al.*, (1999) [3] have found that Meditation increased non-significantly the blood Haemoglobin of subjects. Khare, *et al.*, (1989) [7] have found remarkable improve in Haemoglobin level, total WBC count and PCV as a consequence of Yoga practice. Deshpande, & Bhole, (1982) [4] have concluded insignificant increase in Haemoglobin due to effect of Kapalabhati. Govindarajulu, N. & Shivanadanam, *et al.*, (2004) [5] have met significant mean gain in RBC count as a consequence of Yoga practices.

Objectives: This study has aimed to study the effects of Pranayama on blood Haemoglobin level of the male subjects,

Hypothesis: Practice of Pranayama causes significant increase in blood Hemoglobin of the all subjects.

Methodology

Sampling: This study was conducted in 30 samples from physical education students of degree college Varanasi. Samples were selected by applying the simple random sampling using lottery method. 30 were males of age range 17-21 yrs.

Research design: pre-post single group

Symbolically, A Q₁ X Q₂

Where,

A= single group

Q = pre-test

X= Pranayama (45 min. for each morning and evening per day)

Q₂= Post-test

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Procedures

Cyanmethemoglobin method was used to determine the amount of haemoglobin in the blood. Firstly, by using Cyanmethemoglobin method, blood Haemoglobin of each subject was measured and post measurement of blood Haemoglobin for the same subjects were taken after allowing practice of Pranayama for 30 days. During the practice, each subject was allowed for inhalation (Puraka), retention (kumbhaka) and exhalation (Recaka) in equal ratio, thrice through left nostril and the same through right nostril and then

inhalation through both nostrils and the exhalation through mouth which is supposed to be one round. Same procedure was suggested with different deep feelings in Puraka, Kumbhaka and Recaka steps. The reference of this technique can be obtained from Super Science of Gayatri written by Pandit Sriram Sharma Acaaya, founder of all worlds Gayatri Pariwara.

Results and Discussion

Table 1: Paired Sample Statistics

		Mean	N	S.D	S.E. (Mean)
Pair 1	Pre Hemoglobin.	14.68	30	1.73	0.31
	Post Hemoglobin.	15.80	30	1.46	0.26

Table 2: Paired t-Test table

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	S.D	SE (Mean)	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Pre-Hemoglobin. Post-Hemoglobin	1.11	1.90	0.34	1.82	0.40	3.21	29	0.003

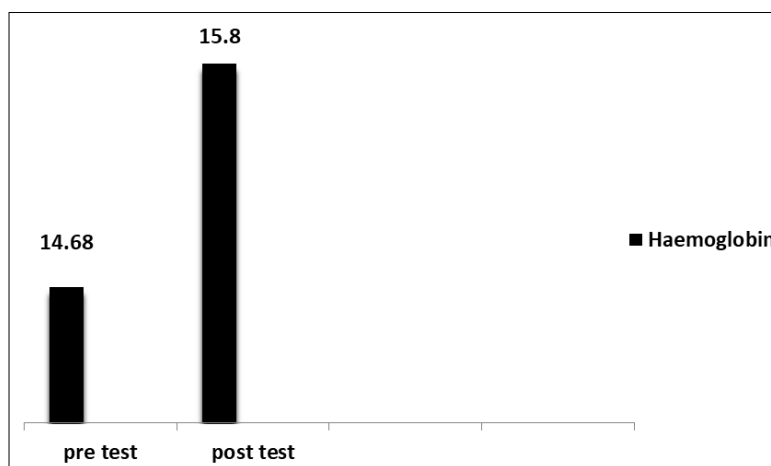


Fig 1: Graph for Total Subjects (Mean)

Interpretation of Findings

The following interpretation can be made on the basis of the results shown in the above output.

The values of the mean, standard deviation and standard error of the mean for the data on Haemoglobin in the pre and post testing are shown in the Table-1. These values can be used for further analysis.

2. It can be seen from Table-2 that the value of t statistic is 3.21. This t value is significant as the p value is 0.003 which is less than 0.05.

For one-tail test, the value of tabulated t at 0.05 level of significance and 29 (N-1 = 29) df which is 2.045. Since calculated value of t (=3.21) is greater than tabulated $t_{0.05}$ (29) (=2.045), Hypothesis may be accepted and it may be concluded that Practice of Pranayama causes significant increase in blood Hemoglobin of the all subjects.

Discussion

This attributes to the fact that the Pranayama intervention for one month had brought significant increase in the Haemoglobin level towards upper range of normalcy. During the practice of Pranayama, in Kumbhaka phase low oxygen state is (hypoxia) created. The principal stimulus for RBC

production in low oxygen state is a circulating hormone called erythropoietin. When the erythropoietin system is functional, hypoxia causes a marked increase in erythropoietin production, and erythropoietin in turn enhances RBC production until the hypoxia is relieved. In this stage, the rate of RBC production can rise to perhaps 10 or more time than normal (Guyton and Hall, 2006) [6]. Moreover, the selected subjects in this study were of normal health and suggested to take normal diet. It was hypothesized that there would be significant increase in Haemoglobin level of subjects due to practice of Pranayama. Practice of Pranayama brought change in Haemoglobin level, but it seemed that the change appeared towards upper limit of normalcy which signifies a healthy physiological status. So, it can be concluded that the practice of Pranayama is physiologically safe for normal people of age group under study and hence can be recommended safely for other age groups to promote health. It can also be referred carefully to anaemic patients as a therapeutic complement.

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