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Effect of yogic training on selected hematological variables among college students

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Abstract

Background: Yoga, is a practice of mental and physical exercise techniques, aiming to acquire good health in human beings. For thousands of years, yoga an ancient holistic relaxation practice has been used as an effective therapeutic tool that counteracts the adverse clinical conditions of human beings. However, the underlying molecular mechanisms that explain these clinical benefits are still an enigma. The efficacy of yoga and meditation as an adjunct to routine management of various diseases and disorder is a great challenge in the present scenario. Ayurvedic knowledge of yoga is much more incompatible with its understanding of biochemical and hematological changes. Exploring the biochemical association with various yogic postures and practices will definitely improve the practice as therapeutic adjuvant and thus, will improve the quality of life.

Objective: The aim of present study was to investigate whether regular practice of Yoga for one month can improve hematological parameters in anemia.

Material and Method: The study group, comprised Govt. College Nagrota Bagwan male students aged between 18 -25years. They were trained for one month of Yoga. Assessments of various parameters were done before and after Yoga practices, were significantly modulated, statistically by using student's test.

Result: Regular practice of yoga for one month significantly improved the R.B.C., W.B.C. count and Hb content (P-.000).

Conclusion: Significant effect of the one month yoga training was found on RBC and WBC and Hemoglobin content

Keywords: Yoga, hematological parameters

Introduction

Yoga, is a practice of mental and physical exercise techniques, aiming to acquire good health in human beings. Holistic health, integrative treatment and mind, body medicine are some of the current buzz words in health care originated actually from yoga, which took its birth some 6000 years ago in India and is one of the elements of ayurvedic medicine as the healing science [1]. Yoga science is emerged as contemplation and also communion and yoking all powers of the body, mind, and soul to God. Yoga practices are gaining popularity and have the potential to make a significant contribution to the field of health sciences. Having a wide array of practice, all essentially including breathing exercises, physical postures and meditation, the science, and art of yoga is reaching new heights. Associated with a series of behavioral modifications that contribute to a healthy lifestyle, traditional yoga is a philosophy for living [2]. Recently, scientists have explored its consistent beneficial biochemical, physiological, psychological effects in human beings. Yoga based training normalizes the functions of the autonomic nervous system by maintaining both sympathetic and parasympathetic indices toward normal [3]. It is found that yoga has an immediate effect on the HPA axis (hypothalamic-pituitary axis) response to stress [4]. Though precise mechanism has not yet been established. Its being hypothesized that some yoga exercises via vagus stimulation, lead to a shift toward parasympathetic nervous system predominance. A significant effect of yoga has been noticed in decreasing the blood glucose level, the heart rate, and systolic and diastolic blood pressure [5]. Blood contains predominantly three types of blood cells including red blood cells (RBC), white blood cells (WBC) and Platelets. Red blood cells are concerned with transport of oxygen to various tissues, white blood cells are basically defense system of body which helps fighting infections and platelets are the backbone of clotting system.

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In addition to this blood contains variety of proteins, most important of which are clotting factors, which in addition to platelets are must for clotting of blood. Human performance in various sports depends on the availability of oxygen to the working muscles, and thus on the ability of the blood to transport oxygen, a function of RBCs. Hence blood oxygen content is most important parameters of hematology which concerns a sportsperson. Oxygen is transported in the blood in two forms; bound to hemoglobin and dissolved in plasma and two of these; it is the oxygen bound to hemoglobin is the most important contributor to blood oxygen content. Another important parameter concerning a sportsperson is the ability of blood to clot as a person may bleed internally or externally in contact sports if clotting system is not intact. Yogasana helps to build strong immune system. In the context of hematological problems, regular Yogic training helps to cure many blood related problems. Series of pawanmuktasana, suryanamaskara, pranayama and shatkarma are very helpful to cure the anemia and deadly disease like cancer. A comprehensive and ancient holistic health system, yoga is a physical and mental discipline that forms part of ayurvedic medicine. Given the limited information available on the hematological and biochemical changes associated with the extended practice of yoga, studies on hematological and biochemical modulation in regular yoga practitioners need extensive research exposure to recommend the use of yoga as a complementary therapy in those cases where the above-mentioned parameters are altered.

Material and Method

The study was carried out on Govt. College Nagrota Bagwan male student. Study group comprised 10 male healthy subjects of 18-25 years. Hematological parameters like total RBC Count, total W.B.C Count and hemoglobin content were determined by Improved Version of automated hematology auto-analyzer Swelab Alfa Sweden. For this Hemogram study, 3 ml of blood was collected in EDTA Vial under aseptic precautions.

Study group underwent yoga practices for 60 minutes twice a day in the presence of a trained yoga teacher for 4 weeks. The first observation of the study group was taken before start yoga practice. Second observation was carried out after one month of yoga practice from the start of study. The study protocol was explained to the subjects and written consent obtained. All the volunteers were clinically examined to rule out any systemic diseases. All subjects were non-alcoholic and non-smokers. They were not taking any drugs, and they had similar dietary habits as well as physical and mental activities at work and home. They were not practicing any known stress relieving or relaxation technique previously. All the 10 volunteers of study group were trained under the

guidance of a certified yogal teacher for 1 month. They carried out Yogasanas, Pranayama and Meditation 60 minutes, twice a day, in morning and evening for one month, under supervision, in a prescribed manner. The schedule consisted of.

- Yogasanas-10 minutes.
- Pranayama-10 minutes.
- Meditation-40 minutes.

The asanas practiced were: Ardachakrasana, Tadasana, Paschimottasana, Utthita Trikonasana, Vajrasana, Salamba Sarvangasana and Halasana.

The Pranayama performed was: Anulom-vilom

The volunteers practiced these exercises early in the morning and in evening, in a quiet, well ventilated room or in open air space sitting in a comfortable posture.

The Meditation performed was: for 15 minute.

Collection of Blood Sample for Hematological parameters.

All of the subjects of study groups were asked to report at 9 am. Taking all aseptic precautions, 3 ml venous blood sample was drawn from the antecubital vein of each subject at first, before start yoga practice, Second blood sample was taken after 1 month of yoga practice from the start of study.

Statistics

The data was analyzed statistically by using statistical software SPSS. Statistical analysis of total RBC Count, total W.B.C Count and hemoglobin content/dl, were done using student' t test and $p < 0.01$ was considered as significant.

Results

Table No. 1, In results showed that the values of all hematological parameters were modulated after 1 month of yoga practice as compared to basal readings, were more significantly changed ($p < 0.000$).

The effect of 01 months of yoga in male study group

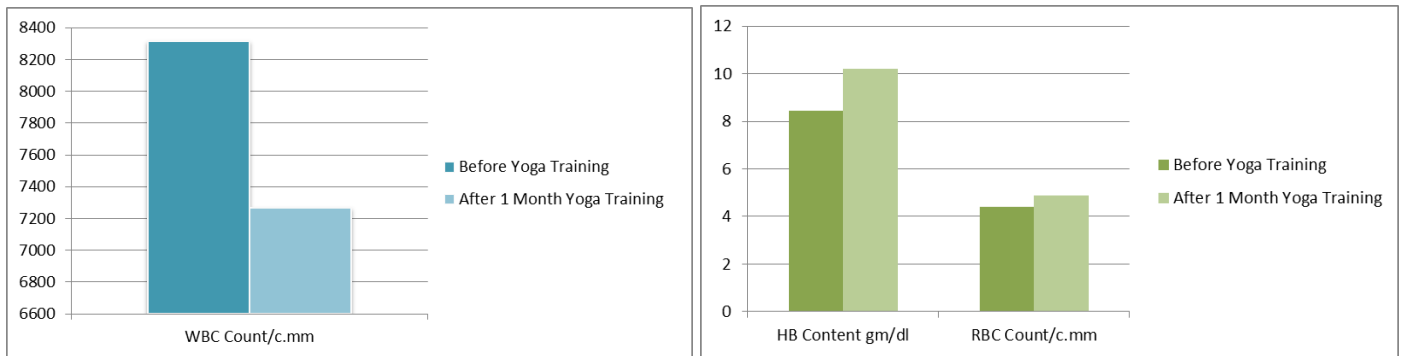
The Total RBC Count/ c.mm increased from mean value 4.39 ± 0.112 to 4.87 ± 0.0324 ($p < 0.000$) statistically more significant & was due to the effects regular practices of yoga.

The Total WBC Count/ c.mm decreased from mean value 8312 ± 32.21 to 7268 ± 52.12 ($p < 0.000$) statistically more significant & was due to the effects of regular practices of yoga.

The HB content gm/dl increased from mean value 8.43 ± 0.235 to 10.2 ± 0.321 ($p < 0.000$) statistically more significant & was due to the effects of regular practices of yoga.

Table 1: showing changes in Total RBC Count/ c.mm, Total WBC Count/ c.mm and HB content/ dl before and after one month of yoga practices in males

a	Parameters	Before Yoga training. Mean Value and S.D	After 1 month Yoga training. Mean Value and S.D	P Value
1.	Total RBC count/c.mm	4.39±0.112	4.87±0.0312	P<0.000
2.	Total WBC count/c.mm	8313±32.12	7268±52.21	P<0.000
3.	HB content gm/dl	8.43±0.235	10.2±0.321	P<0.000



Graph 1: showing changes in Total RBC Count/ c.mm, Total WBC Count/ c.mm and *HB content/ dl* before and after one month of yoga practices in males

Discussion

On analyzing the effect of yoga on hematological parameters in normal healthy subjects of Govt. College Nagrota Bagwan Students of age between 18-25 years, in our study, total RBC Count, total W.B.C Count and hemoglobin content/dl count were studied in study group before yoga and after one months of yoga (Asana, Pranayama and Meditation).

The study group male students showed the effect of yoga on total RBC Count was increased (<0.000), whereas total WBC Count was decreased (<0.000) and hemoglobin content/dl was increased (<0.000), and all these parameters were modulated due to regular practices of yoga. Practice of Yogasana improves biochemical profile indicating anti-stress and antioxidant effect, important in production of degenerative disorders. Earlier studies have shown significant improvement in RBC with practice of Yogasana for about 4 weeks. Apparent increase in the concentration of red blood corpuscles is due to mobilization of plasma from blood to tissue fluid. Besides this, Yogic asanas, pranayama and exercise makes a greater amount of oxygen supply thus putting into circulation the red blood corpuscles stored in spleen and accessory spleen. Asanas and exercise also increase the myoglobin pigment which is helpful to supply more amount of oxygen. Yogic asanas and pranayamas minimize all types of stress of body. Leucocytes count increase only when there is stress and allergy but the effect of yogic asanas decreases total leucocytes count indicating anti-stress and allergy but the effect of yogic asana decreases total leukocyte count indicating anti-stress mechanisms of the body whether it is physical, physiological or psychological. There was significant improvement in Hemoglobin, content in subjects after 1 weeks training course. Yoga asanas significantly increase hemoglobin (Hb) content. Effect of Sudarshan Kriya yoga was also significantly increase hemoglobin content. It can be hypothesized that it is due to anti-stress and antioxidant effect of yoga. The effect of yoga on anemic patients was significantly increase hemoglobin content due to increased red blood cell count can be explained by two different mechanisms; it may be due to hypoxia that release more erythropoietin during yoga practices and second is that yoga practices increased release of iron stores from reticulo endothelial cells and splenic contraction enhance the release of reserved RBCs. Asanas minimizes all types of stress whether it is physical, physiological or psychological as revealed by decreased leukocyte count after yoga. Decline in total WBC count may be due to the concept that hypoxia induced during yoga, increase erythroied series in bone marrow causes relative decrease in WBC count or Yoga may transited the WBC in their resting condition and decrease various cytokines which are responsible for leucopoiesis.

Significant improvement in red blood cells count is due to effect of yoga. Cardioprotectant factor of yoga practice increase in hemoglobin may be justified by the anti-stress effect produced by parasympathetic dominance Sudarshan kriya and pranayam significantly increased platelet count, packed cell volume suggested that stress-induced pro inflammatory cytokine production may stimulate the proliferation of hematopoietic cells. Yoga is being used increasingly in the medical field as a healing modality for adult patients experiencing serious illness involving alterations in the hematological profile of the patients including for those undergoing chemotherapy and radiation treatment for cancer. Documented scientific evidence strongly indicates that yoga has promotive, preventive as well as curative potential. As a non-pharmaco therapeutic and safe modality it can be used as a effective lifestyle adjunct to medical treatment to reduce drug dosage and improve quality of life of patients. It is to be emphasized that yoga is very effective for prevention as well as management of all pervading stress and stress related disorders.

Conclusion

In the epoch of current civilization, the wallop of industrialization technology can be envisioned on every facet of human life. This fast changing synopsis has changed every individual into a working machine as his addiction on motorized machine is developing with the passage of each day. The main reason behind this is because he always has urge to earn more and more money to deluge earlier of others and to get more sickness for himself and his family. So, consequently, he is always leading a life of enough tension and undesirable pressures. Money has become the main rover of his life. It is all and sundry for himself, father, mother and children. In the quest of materialism he has abandoned all the social requirements, relations and even ethics and his own health. So consequently, he is unable to fixed surplus time even a smaller period of time to look after his health. Due to this situation he is more recumbent to all sorts of ailments due to lack of proper exercise, diet and rest. Longer duration and unscheduled working hours, unbalanced diet and less rest periods have turned him into a physically weaker, mentally unbalanced, emotionally debouched and socially antagonistic individual. Yoga practices hold great promise and potential in the field of medical science. Yoga therapy will definitely emerge as a major branch of medical treatment and eventually become a standard of care and practice in coming few years. India has made great progress in yogic science research as evidenced by a number of scientific and clinical papers in various journals. Although Yoga as therapy is still at the stage of clinical research, advances have been made in

understanding how to use these practices for treating various diseases via correlating its biochemical, hematological spectrum. As an improvement of study design of clinical studies trying to identify disease spectrum of specific yoga activity.

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