



EFFECT OF FOUR MONTH OF YOGIC TRAINING PROTOCOL ON SELECTED HEMATOLOGICAL PARAMETERS OF FEMALE RHEUMATOID ARTHRITIS PATIENTS

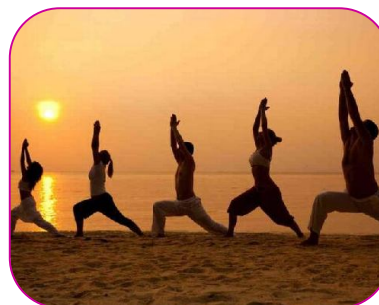
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ABSTRACT

Purpose: The Purpose of the study was to find out the “effect of four month of yogic training protocol on selected hematological parameters of female rheumatoid arthritis patients.”

Twenty Five (25) female rheumatoid arthritis patients from Haridwar, Rishikesh and Dehradun, India were selected as subjects. The age of the subjects were ranged from 40-60 years. It was hypothesized that there would be a significant effect of four month of yogic training protocol on selected hematological parameters of female rheumatoid arthritis patients.. All the subjects were divided into single experimental group (N=25). They were subjected to four month yogic training (independent variable) of selected Yogasana, Shatkarma, Prayanama and Yoga Nidra. Hematological variables include hemoglobin level, Total Leukocyte count, Segmented Neutrophils and Lymphocytes. Pretest posttest single group design was used for comparing the data. Data were collected by administration of laboratory tests for selected hematological variables. The data collected on Hematological variables was analyzed by dependent “t” test. The level of significance for testing the hypothesis was set at 0.05. The results have shown that yogic training protocols significantly affect the hemoglobin level, total leukocyte count and segmented Neutrophils level. The mean values of hemoglobin before and after training were 10.56 and 11.42 respectively. The calculated t- value for hemoglobin was 3.85 which showed significant difference. ($t_{cal}=3.85 > t_{tab}=2.06$). The mean values of total leukocyte count before and after training were 9763.6 and 8796 respectively. The calculated t- value for total leukocyte count was 3.10 which showed significant difference. ($t_{cal}=3.10 > t_{tab}=2.06$). The mean values of segmented neutrophils level before and after training were 55.44 and 57.80 respectively. The calculated t- value for segmented neutrophils level was 2.08 which showed significant difference. ($t_{cal}=2.08 > t_{tab}=2.06$). The results have further shown that yoga practices insignificantly affect the lymphocytes. The mean values of lymphocytes before and after training were 34.20 and 33.52 respectively. The calculated t- value for lymphocytes was 0.62 which showed no significant difference. ($t_{cal}=0.62 < t_{tab}=2.06$).



KEY WORD: Yogasana, Prayanama, Shatkarma, rheumatoid arthritis, Hematological variables.

INTRODUCTION

Rheumatoid arthritis (RA) is a chronic auto immune disease with no cure which affects people of old age and may reach 5% above the age of 55 by affecting 80-90% hands and wrist joints of Rheumatoid arthritis patients. Patients having Rheumatoid arthritis complain of many inflammatory symptoms including joint pain and stiffness, loss of range of movement and reduction in muscle power and grip strength that leads to increased difficulties in performing daily life activities. Rheumatoid arthritis disease generally affects

the hands and feet first but it can occur in any joint. It usually involves the same joints on both sides of the body. Rheumatoid arthritis is an autoimmune disease. It is also a systemic auto immune disease which means it affects the whole body.

Yoga is a word comes from Indian language Sanskrit which means join. Yoga is a group of physical, mental and spiritual practices which originated in ancient India. Pranayama is a control of own Breath. "Prana" is vital energy or pranik Breath in the human body where Prana represents the Pranic energy responsible for life or life force, and "Ayama" means control. So Pranayama is Control of Breath. Basically Pranayama is a formal practice of controlling the breath which is the source of our prana, or vital life force. There are five types of prana are responsible for various pranic activities in the human body. They are Prana, Apana, Vyan, Udana and Samana. Out of these Prana and Apana are most essential. Prana is upward flowing and Apana is downward flowing.

Bernstein, S. (2011, May 4). Yoga, a practice of exercises, breathing techniques and meditation that started in ancient India, has been touted as a way to boost physical and mental health for 5,000 years. yoga is proven to help people with arthritis improve many physical and psychological symptoms. Recent scientific studies of people with various types of arthritis show that regular yoga practice can help reduce joint pain, improve joint flexibility and function and lower stress and tension to promote better sleep. Yoga comes in many different forms, but generally involves positioning the body in various poses along with coordinated breathing and meditation exercises.

(www.yogapoint.com) The hatha yoga cleansing processes have been placed into six groups of purification practices known as shatkarmas, 'Shat' meaning six and 'karma' meaning action. They are described in the ancient texts of the Hatha Yoga Pradipika and Gherand Samhita. The six shatkarmas are neti, cleansing of the nasal passages, dhouti, cleansing of the alimentary canal, nauli, strengthening of the abdominal organs, basti, cleansing of the large intestine, kapalbhati, cleansing of the frontal area of the brain and tratak, intense gazing of a point developing concentration and cleansing the mind. A variety of practices come under these categories. We will look at the following cleansing practices that can be helpful for many problems. Hatha Yoga describes **Shatkarmas (six processes)** in details for **Body purification** and **mind purification**. Various asanas (Yoga Positions), six shatkarmas, mudras & bandhas (psychic knots or psycho-physiological energy release techniques) and Pranayama are described in old ancient sanskrit texts of Hatha Yoga (Hatha Yoga Pradipika and Gherandasamhita). Yoga Nidra is a meditative yogic practice. It is a state on borderline of sleep and wake fullness. Its nothing but Perfect Relaxation. Yoga Nidra can be practiced individually or together with any no of participants but in a room or closed hall. You have to follow the instructions given under the sub heading Prerequisites, Preparation and Preposition.

Garfinkel M and Schumacher HR Jr.(2000) Yoga is an ancient tradition that has been westernized and often practiced for its proposed health benefits. Traditional texts describe its benefits for many types of arthritis. Two limited studies of yoga in osteoarthritis of the hands and carpal tunnel syndrome show greater improvement in pain than in control groups. Yoga uses stretching and improves strength so that it theoretically should be beneficial for some musculoskeletal problems. Yoga merits further study into its cellular and physiologic effects.

Haaz, S., & Bartlett, S. J. (2011) conducted study and written review article. The aim of article was to systematically review the existing literature on the use of yoga for persons with arthritis. We included peer-reviewed research from clinical trials (published from 1980- 2010) that used yoga as an intervention for arthritis patients and reported quantitative findings. Eleven studies were identified, including four RCTs and four NRCTs. All trials were small and control groups varied. No adverse events were reported and attrition was comparable or better than typical for exercise interventions. Evidence was strongest for reduction in disease symptoms (tender/swollen joints, pain) and disability, as well as improved self-efficacy and mental health. Interventions, research methods and disease diagnoses were heterogeneous. Larger, rigorous RCTs are necessary to more effectively quantify the effects of yoga for arthritic populations

Telles S and Naveen KV.(1997) suggested the use of yoga for rehabilitation has diverse applications. Yoga practice benefited mentally handicapped subjects by improving their mental ability, also the motor co-

ordination and social skills. Physically handicapped subjects had a restoration of some degree of functional ability after practicing yoga. Visually impaired children children showed a significant decrease in their abnormal anxiety levels when they practiced yoga for three weeks, while a program of physical activity had no such effect. Socially disadvantaged adults (prisoners in a jail) and children in a remand home showed significant improvement in sleep, appetite and general well being, as well as a decrease in physiological arousal. The practice of meditation was reported to decrease the degree of substance (marijuana) abuse, by strengthening the mental resolve and decreasing the anxiety. Another important area is the application of yoga (and indeed, lifestyle change), in the rehabilitation of patients with coronary artery disease. Finally, the possible role of yoga in improving the mental state and general well being of HIV positive persons and patients with AIDS, is being explored.

Singh VK, et al. (2011) conducted study to find out the effect of yogic package (YP) with some selected pranayama, cleansing practices and meditation on pain intensity, inflammation, stiffness, pulse rate (PR), blood pressure (BP), lymphocyte count (LC), C-reactive protein (CRP) and serum uric acid (UA) level among subjects of rheumatoid arthritis (RA). Randomized control group design was employed to generate pre and post data on participants and controls. Repeated Measure ANOVAs with Bonferroni adjustment were applied to check significant overall difference among pre and post means of participants and controls by using PASW (SPSS Inc. 18th Version). Observed result favored statistically significant positive effect of YP on selected RA parameters and symptoms under study at $P < 0.05$, 0.01 and 0.001 respectively that showed remarkable improvement in RA severity after 40-day practice of YP. It concluded that YP is a significant means to reduce intensity of RA.

Dash M and Telles S. (2001) conducted study to find out the The present study aimed at assessing the effects of a set of yoga practices on normal adults ($n = 37$), children ($n = 86$), and patients with rheumatoid arthritis ($n = 20$). An equal number of normal adults, children, and patients with rheumatoid arthritis who did not practice yoga were studied under each category, forming respective control groups. Yoga and control group subjects were assessed at baseline and after varying intervals, as follows, adults after 30 days, children after 10 days and patients after 15 days, based on the duration of the yoga program, which they attended, which was already fixed. Hand grip strength of both hands, measured with a grip dynamometer, increased in normal adults and children, and in rheumatoid arthritis patients, following yoga, but not in the corresponding control groups, showing no re-test effect. Adult female volunteers and patients showed a greater percentage improvement than corresponding adult males. This gender-based difference was not observed in children. Hence yoga practice improves hand grip strength in normal persons and in patients with rheumatoid arthritis, though the magnitude of improvement varies with factors such as gender and age.

Bosch PR, et al. (2009) conducted study and said that Stress, both psychological and physiological, has been implicated as having a role in the onset and exacerbations of rheumatoid arthritis (RA). This study investigated whether neuroendocrine and physical function in women with RA can be altered through a yoga intervention. Exercise intervention. University research conducted at a medical clinic. Sixteen independently living, postmenopausal women with an RA classification of I, II, or III according to the American College of Rheumatology functional classification system served as either participants or controls. The study group participated in three 75-minute yoga classes a week over a 10-week period. At baseline and on completion of the 10-week intervention, diurnal cortisol patterns and resting heart rate were measured. Balance was measured using the Berg Balance Test. Participants completed the Health Assessment Questionnaire (HIQ), a visual analog pain scale, and the Beck Depression Inventory. Yoga resulted in a significantly decreased HAQ disability index, decreased perception of pain and depression, and improved balance. Yoga did not result in a significant change in awakening or diurnal cortisol patterns ($P = .12$).

METHODS

Subjects: Twenty Five (25) female rheumatoid arthritis patients from Haridwar, Rishikesh and Dehradun India were selected as subjects. The age of the subjects were ranged from 40-60 years. **Hypothesis**

It was hypothesized that there would be a significant effect of four month of yogic training protocol on selected hematological parameters of female rheumatoid arthritis patients.

Criterion Measures

Hematological parameters including hemoglobin level, Total Leukocyte count, Segmented Neutrophils and Lymphocytes were measured by the pathology expert of pathology lab by collection of the blood sample from the vein.

Experimental Design:

Pretest-post test Single Group design was used as experimental design in which total 25 female patients were selected in experimental group. Total 25 subjects were underwent pretest just before the commencement of four month of yogic training protocol. The final posttest was taken by the laboratory expert after completion of four month of yogic training protocol.

Collection of Data

Data on the selected variables were collected as per the method prescribed in test administration one day prior to the commencement of four month of yogic training and one day after the completion of training programs. The post test data were also collected after 24 hours of the completion of four month of yogic training protocol. Data were collected by administration of laboratory tests for selected hematological variables. The tests were administered after giving them instruction and taking consent from the subjects.

Training Protocol

During the training period Experimental Group was undergone four month of selected Asanas, Prayanamas, shatkarma and Yog nidra training protocol. The Experimental Group was taken their respective Asanas, Prayanamas, shatkarma and Yog nidra training program during morning hours (5:30 am to 7.00 am) under strict supervision of the investigator. All the subjects involved in this study were carefully monitored throughout the Asanas, Prayanamas, shatkarma and Yog nidra training program avoiding injuries. The Yoga Training was given 6 days in a week.

Day	Asanas-Pranayamas	Duration 7:00am to 8.30am
Monday	tadasana, katichakrasana, uktasana, ustrasana, ardhymatseyndrasana, bhungasana, dhanurasana and supr pawanmuktasana). Each asana was repeated 6 times	90 Min
Tuesday	pawanmuktasana, tadasana, katichakrasana, uktasana, supt-pawanmuktasana, ustrasana, ardhymatseyndrasana, paschimotasana, bhungasana, dhanurasana and shavasana Prayanama include nadisodhan prayanama, ujjayi prayanama, suryabhedi prayanama, bhastrika prayanama. Five minutes for each prayanama.	90 Min
Wednesday	tadasana, katichakrasana, uktasana, supt-pawanmuktasana, ustrasana, ardhymatseyndrasana, paschimotasana, bhungasana, dhanurasana and shavasana. nadisodhan prayanama, ujjayi prayanama, suryabhedi prayanama, bhastrika prayanama. Kunjal kriya	90 Min
Thursday	pawanmuktasana, tadasana, katichakrasana, uktasana, supt-	90 Min

	pawanmuktasana, ustrasana, ardhyamatseyndrasana, paschimotasana, bhungasana, dhanurasana and shavasana Prayanama include, bhastrika prayanama and Bhramari prayanama. Five minutes for each prayanama.	
Friday	tadasana, katichakrasana, ardhyamatseyndrasana, bhungasana, dhanurasana. Bhramari prayanama.	90 Min
Saturday	pawanmuktasana, tadasana, katichakrasana, uktasana, supt- pawanmuktasana, ustrasana, ardhyamatseyndrasana, paschimotasana, bhungasana, dhanurasana and shavasana Prayanama include, Nadi	90 Min
	shodhan prayanama, bhastrika prayanama and Bhramari prayanama. Vasti kriya. Five minutes for each prayanama.	

Each Asana was repeated 4 times. The same Asanas, Prayanamas, shatkarma and yoga nidra training programme were continued for four month. Duration of Asanas, Prayanamas, shatkarma and yoga nidra training programme on each day basis: one and half hour (1hour 10min for Asanas and 20 min for Pranayamas).

STATISTICAL PROCEDURE

In order to find out the effectiveness of four month of yogic training protocol on selected hematological variables of female rheumatoid arthritis patients, all relevant statistical analysis which includes Mean, Standard Deviation and dependent t test were employed with the help of MS Excel. To test the hypothesis the level of Significance was set at 0.05 levels ($p < 0.05$).

RESULTS

Findings pertaining to each of the selected hematological variables of experimental group which were subjected to the 't' ratio has been given in Table 1 to 4.

TABLE – 1
SIGNIFICANT DIFFERENCE BETWEEN PRE-TEST AND POST- TEST MEANS OF EXPERIMENTAL GROUP IN HEMOGLOBIN OF FEMALE RHEUMATOID ARTHRITIS PATIENTS

TEST	SAMPLE SIZE	MEAN	SD	"t" RATIO	TAB. t
Pre-test	25	10.56 g/dl	2.30	3.85*	2.06
Post-test	25	11.42 g/dl	1.64		

* Significant difference at 0.05 level of significance, $t_{0.05} (24) = 2.06$

Table-1 reveals that there was significant difference in the initial means and the final means of hemoglobin level of female rheumatoid arthritis patients after the completion of four months yogic training protocol as the obtained 't'- ratio (**3.85***) was greater than the tabulated 't' value (2.06) at 0.05 level of significance at 24 degrees of freedom.

TABLE – 2
SIGNIFICANT DIFFERENCE BETWEEN PRE-TEST AND POST- TEST MEANS OF EXPERIMENTAL GROUP IN TOTAL LEUKOCYTE COUNT OF FEMALE RHEUMATOID ARTHRITIS PATIENTS

TEST	SAMPLE SIZE	MEAN	SD	“t” RATIO	TAB. T
Pre-test	25	9763.6 mcl	2557.35	3.10*	2.06
Post-test	25	8796.00 mcl	2058.76		

* Significant difference at 0.05 level of significance, $t_{.05} (24) = 2.06$

Table-2 reveals that there was significant difference in the initial means and the final means of total leukocyte count of female rheumatoid arthritis patients after the completion of four months yogic training protocol as the obtained ‘t’- ratio (**3.10***) was greater than the tabulated ‘t’ value (2.06) at 0.05 level of significance at 24 degrees of freedom.

TABLE – 3
SIGNIFICANT DIFFERENCE BETWEEN PRE-TEST AND POST- TEST MEANS OF EXPERIMENTAL GROUP IN SEGMENTED NEUTROPHILS OF FEMALE RHEUMATOID ARTHRITIS PATIENTS

TEST	SAMPLE SIZE	MEAN	SD	“t” RATIO	TAB. t
Pre-test	25	55.44	3.95	2.08*	2.06
Post-test	25	57.80	4.26		

* Significant difference at 0.05 level of significance, $t_{.05} (24) = 2.06$

Table-3 reveals that there was significant difference in the initial means and the final means of segmented Neutrophils level of female rheumatoid arthritis patients after the completion of four months yogic training programme as the obtained ‘t’- ratio (2.08*) was greater than the tabulated ‘t’ value (2.06) at 0.05 level of significance at 24 degrees of freedom.

TABLE – 4
SIGNIFICANT DIFFERENCE BETWEEN PRE-TEST AND POST- TEST MEANS OF EXPERIMENTAL GROUP IN LYMPHOCYTES OF FEMALE RHEUMATOID ARTHRITIS PATIENTS

TEST	SAMPLE SIZE	MEAN	SD	“t” RATIO	TAB. t
Pre-test	25	34.20	5.26	0.68	2.06
Post-test	25	33.52	5.72		

* Significant difference at 0.05 level of significance, $t_{.05} (24) = 2.06$

Table-4 reveals that there was no significant difference in the initial means and the final means of lymphocytes level of female rheumatoid arthritis patients after the completion of four months yogic training programme as the obtained ‘t’- ratio (0.68) was lower than the tabulated ‘t’ value (2.06) at 0.05 level of significance at 24 degrees of freedom.

DISCUSSION OF FINDINGS

It was observed from the above findings those four months of Yogic training protocol was found to be effective on hemoglobin level, total leukocyte count and segmented Neutrophils level for experimental group. Table -1, 2 and 3 showed that the Yogic Practices training programme have positive effect on

hemoglobin level, total leukocyte count and segmented Neutrophils level. High level of hemoglobin is beneficial for health of the female patients. Higher or lower numbers of leukocyte than normal can be a sign of an underlying condition. Neutrophils are powerful white blood cells that destroy bacteria and fungi. Yogic training increases the value of Neutrophils and it was significant. The analysis of data further reveals that no significant effect in lymphocytes was found at the 0.05 level of significance. Lymphocytes are vital for producing antibodies that help the body to defend itself against bacteria, viruses and other threats. Yogic training increases the value of Lymphocytes but it was not significant.

TESTING OF HYPOTHESIS

The hypothesis which was stated that there would be a significant effect of four month of Yogic training protocol hemoglobin level, total leukocyte count and segmented Neutrophils level of female patients having rheumatoid arthritis was accepted.

The hypothesis which was stated that there would be a significant effect of four month of Yogic training protocol on Lymphocytes of female patients having rheumatoid arthritis was rejected.

CONCLUSIONS

Within the limitations of the study the following conclusion is drawn:

1. Four month of selected Yogic training significantly affect the hemoglobin level, total leukocyte count and segmented Neutrophils level of female patients having rheumatoid arthritis.
2. Four month of selected Yogic Practices insignificantly affect the Lymphocytes of female patients having rheumatoid arthritis.

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