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BIOCHEMICAL INVESTIGATION LEVELS IN BEFORE AND AFTER REGULAR YOGA PRACTITIONERS

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ABSTRACT

Yoga therapy has great practical relevance to modern medicine with promotion, preventive and curative potential. Given the limited information available on the biochemical changes associated with the extended practice of yoga. Our study is to assess the influence that prolonged practice has on the blood parameters like lipid and blood sugar were measured before and after yoga therapy and yoga practicing control group. We found there is decreased levels in fasting blood sugar, AST, Cholesterol, Triglycerides, very low-density lipoprotein (LDL) were significantly decreased while high-density lipoprotein (HDL) was raised in long term yoga practicing subjects comparing with before yoga practicing same group of subjects and comparing with yoga practice control group.

Keywords: Yoga, cholesterol, Triglycerides, Fasting Blood glucose, Quality life

INTRODUCTION

Yoga, a form of physical activity, is rapidly gaining in popularity and has many health benefits. Yet healthcare providers have been slow to recognize yoga for its ability to improve health conditions, and few interventions have been developed that take full advantage of its benefits.

The state of the mind and that of the body are intimately related. If the mind is relaxed, the muscles in the body will also be relaxed. Stress produces a state of physical and mental tension. Yoga, developed thousands of years ago, is recognized as a form of mind-body medicine. In yoga physical postures and breathing exercises improve muscle strength, flexibility, blood circulation and oxygen uptake as well as hormone functions. In addition, the relaxation induced by meditation helps to stabilize the autonomic nervous system with a tendency towards parasympathetic dominance. Physiological benefits, which follow, help yoga practitioner become more resilient to stressful conditions and reduce a variety of important risk factors for various diseases, especially cardio-respiratory diseases **[1]**.

Yoga is a heterogeneous set of activities and different studies implement yoga in very different ways. This heterogeneity, while reflecting the richness and diversity of yogic approaches, also makes the comparison of findings across studies difficult, and limits our ability to understand the mechanisms by which yoga affects physical and mental wellbeing **[2]**. The practice of yoga stimulates blood circulation, improves physical fitness, concentration, mental stability and spiritual development **[3]**. It stimulates endocrine organs, viscera of the abdomen and thorax by which a better state of health is achieved.

Also detailed studies on how exactly yoga and physical exercise affect various blood parameters in humans have not yet been reported to the best of our knowledge. As information was found wanting in this area the aim of our investigation was to measure the various physiological, biochemical, electrolyte, acid-base and blood gas parameters before and after yoga and vigorous physical exercise and compare them. This study will throw light on the metabolic changes brought about by yoga when compared to physical exercise and whether yoga is as effective or superior to physical exercise in bringing about beneficial metabolic changes. Yoga therapy has great practical relevance to modern medicine with promotion, preventive and curative potential. Yoga promote positive health, vitality, sense of wellbeing and increased

quality of life. They are also effective in controlling and managing stress related, chronic degenerative, age and life style related disorders **[4-5]**.

Recent research has confirmed the therapeutic effect on some diseases. Women subject to psychological stress found significant improvement of their symptoms after a three-month yoga program **[6]**. In diabetic patients a sustained drop in glucose levels was achieved, both after fasting and after eating and an increase in the number of insulin receptors associated with decreased resistance was confirmed **[7]**. Yoga also acts as an essential variable in the prevention of cardiovascular disease **[8]**. Clinical practice guidelines for chronic back pain recommend it for its analgesic effect **[9-10]**. It has been observed that a three-month practice of yoga for patients suffering from chronic renal insufficiency **[11]**, undergoing haemodialysis, raises the red blood cell count by 11%, the hematocrit by 13% and lowers pain by 37% tiredness by 55%, urea by 29% and creatinine by 14% .With regard to biochemical parameters, we have assessed the effects of yoga on the metabolic syndrome **[12]**, on the lipid **[13]** and renal profiles **[14]** and have observed a certain modulating effect.

Based on the clinical improvement in those processes where biopsychosocial stressors of special intensity are involved and particularly biochemical parameters were improved in previous study patients limited information available on the hematological and biochemical changes associated with the extended practice of yoga, so our study is to assess the influence that prolonged practice has on the blood parameters like lipid and blood sugar were measured before and after yoga therapy and yoga practicing control group . The study was conducted through the Pondicherry private Yoga centre and the study was conducted by Sri Lakshminarayana institute of medical sciences. The subjects were selected who were residing in and around Pondicherry, located within the radius of 20 km from college. For this study institutional ethical clearance was obtained from Institutional Ethical Committee clearance. (IEC)

MATERIAL AND METHODS

Participants 30 healthy subjects (15 male, 15 female) aged between 30 and 50 took part in this study. The difficulty encountered in the selection of the sample, given the very nature of the study, determined that the age range of participants needed to be similar in both groups (control and experimental) to preclude its influence on the results obtained.

The experimental group consisted of 15 long-term yoga practitioners before

and after yoga practice (8 female and 7 male), while the control group was made up of 15 ordinary subjects (8 female and 7 male). Experimental study individuals were of the same age and sex as the experimental group and followed a similar lifestyle but had no experience of yoga or similar techniques.

All subjects volunteered to participate in the study and gave written informed consent. Only healthy subjects, with regular daily life habits, none of whom took any type of drugs or played sports regularly, were chosen to be part of the experimental or control groups. Female participants were all within the firstweek of their last menstrual cycle.

Blood sampling before 9.30 a.m, collected blood samples from a forearm vein of all the participants, in identical basal repose and fasting (more than eight hours) conditions. Experimental subjects were collected before and after yoga practice. The clinical laboratories analyzed the following blood parameters: glucose, urea, creatinine, uric acid, bilirubin, AST, ALT alkaline phosphatise, total protein and albumin.

The biochemical analysis (glucose, urea, creatinine, uric acid, bilirubin, AST, ALT, alkaline phosphatase, total proteins and albumin) was carried out according to the following protocol: 5 ml of blood in biochemical tube with a polyacrylamide gelatine separator and results were determined by Siemens fully automated analyzer.

Statistical Analysis

All results were summarized as mean ± SEM. The statistical analysis was done using SPSS 11.5 (SPSS, Inc., Chicago)., and the comparison between patients and control was done by using Anova. A P-value less than 0.05 were considered statistically significant. The study determined the application analyze the differences between the experimental and control groups of various dependent variables: glucose, urea, creatinine, uric acid, bilirubin, GOT, GPT, GGT, alkaline phosphatase, total proteins and albumin.

RESULTS

Table 1: Mean, standard deviation (SD) in the control, before and after yoga practicing groups

S.no	Percentage	Before yoga practicing	After yoga practicing	Control group	P Value
1	Glucose	102.34±14.21	98.21±13.31	85.57±12.08	NS
2	Urea	27.48±1.09	22.32±1.05	21.43±1.04	NS
3	Creatinine	0.78±0.07	0.69±0.03	0.88±0.10	NS
4	Uric acid	5.3±0.96	4.8±0.89	5.1±0.91	NS
5	Cholesterol	201.23±28.12	183.12±24.17	175.26±23.78	p<0.001
6	Triglyceride	199.45±26.32	185.23±24.28	176.12±23.84	p<0.001
7	HDL	50.38±9.92	50.68±9.95	52.84±9.46	NS
8	Total protein	7.1±0.54	7.0±0.58	7.2±0.52	NS
9	Albumin	3.95±0.67	3.96±0.69	3.93±0.68	NS
10	AST	50.3±9.32	25.32±11.12	34.8±25.17	P<0.001
11	ALT	29.2±25.1	28.6±26.32	30.8±24.1	NS
12	ALP	87.3±12.34	80.2±13.31	86.1±12.21	NS

DISCUSSION

The general health benefits of yoga and its therapeutic effect in some disease states is available in literature **[15-16]**. But there have been few studies which compared the health outcomes after yoga and physical exercise **[17]**.

The World Health Organization (WHO) defines health as physical, mental, social welfare and not just lack of diseases and disability. One of the criteria to assess societies' health is the mental health status. Mental health plays an important role in dynamism and efficacy of each society **[18]**.

There are several national and international studies which have very clearly shown therapeutic effects of yoga therapy in effectively managing the various chronic health disorders affecting almost all the major organ systems including cardiovascular, respiratory, neuroendocrine, gastrointestinal and musculo-skeletal system. However, only very few studies have been conducted to study the effect of yoga therapy on menopausal symptoms.

Previous studies **[17]** conducted among normal and diseased subjects to see the effect of yoga on various biochemical parameters including renal and hepatic profile, glucose, uric acid total protein, and albumin.

Our study reports are decreased fasting blood sugar levels were found in long term yoga practicing subjects comparing with before yoga practicing same subjects and yoga practice control group but we did not done post pandrial blood sugar. Our study is co-relating with other study Madanmohan *et al* **[17]** have reported the effect of yoga practice in prevention and management of diabetic mellitus. He found a significant decrease in the fasting and postprandial glucose level.

Our study reports are Total cholesterol (TC), triglyceride, and very low-density lipoprotein (LDL) were significantly decreased while high-density lipoprotein (HDL) were remarkably raised levels were found in in long term yoga practicing subjects comparing with before yoga practicing same subjects and with yoga practice control group. This Biochemical lipids also correlating with other study and they reported as Total cholesterol (TC), triglyceride, and very low-density lipoprotein (LDL) were significantly decreased while high-density lipoprotein (HDL) was raised. Furthermore, all the lipid ratios were desirably raised **[17]**.

There is slight decreased of Aspartate transaminase levels were found in long term yoga practicing subjects comparing with before yoga practicing

same subjects and comparing with yoga practice control group

Other a study reports was concerned biochemical markers including lipid profile are significantly controlled well within limit **[19]**. As the yogic practices do not bring about increased, rapid large muscle activity and energy expenditure, its beneficial effects in the management of dyslipidemia and obesity cannot be justified **[17-20]**. Patients with angiographically proven coronary disease in a randomized controlled study, after 1-year yoga practice, significantly reduced weight and controlled various biochemical parameters **[21]**. Lipid lowering and plaque-stabilizing effects of yoga exercise have been speculated to be similar to statins (HMG-CoA reductase inhibitors) **[22-23]**.

There is no changes were observed in albumin levels in advanced yoga practitioners. Previous studies on the subject have shown inconclusive results albeit after a yoga practice period lasting only a few weeks. Other authors have found **[24]** that after only a short period of practice, albumin figures decreased while yet another study on the effects of a six-week yoga program showed no significant changes in albumin levels **[25]**. From the outcome of these large numbers of studies done, it is obvious that yogic practices have some definite role in modifying the blood-related parameters of the subjects and thereby prevention of some disorders. Previous clinical trials showed that yoga may produce improvements in stress levels, quality of life, aspects of interpersonal relating, autonomic nervous system functioning, and labor parameters **[25]**.

There is no changes were found in the levels of Urea, Creatinine, Uricacid, Total protein, albumin, SGPT, Alkaline phosphatase in long term yoga practicing subjects comparing with before yoga practicing same subjects and comparing with yoga practicing control group. The yoga diet is vegetarian and includes vegetables, cereals, fruit, and legumes as well as dairy products and honey. In any event, most of these foods contain enough protein so as not to affect the albumin levels in blood. It is possible that the nutritional habits of advanced practitioners of yoga may explain these biochemical changes but further specific nutritional research will be necessary to determine this fact. Further research is needed to verify these preliminary results as well as to assess their possible application as complementary therapy.

The purpose of this article is to study using yoga programs and to determine the effect of yoga interventions on routine biochemical parameters of yoga practicing subjects before and after long

term practice in same group and yoga practicing control group. Yoga had a positive effect on peoples general health and improved the signs of physical and sleep disorders, lowered anxiety and depression, and promoted their social function. Therefore, Yoga can be used as one of the effective strategies on peoples general health.

CONCLUSION

Our Study findings were to determine the effect of yoga interventions on routine biochemical parameters of yoga practicing subjects before and after long term practice in same group and yoga practicing control group. We found there is decreased levels in fasting blood sugar, AST, Cholesterol, Triglycerides, very low-density lipoprotein (LDL) were significantly decreased while high-density lipoprotein (HDL) was raised in long term yoga practicing subjects comparing with before yoga practicing same group of subjects and comparing with yoga practice control group. Furthermore, all the lipid ratios were desirably raised. Our study reports showed there is decreased parameters after yoga practice, this will be resulting improvement in stress levels quality of life.

Conflict of interest- Nil

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