



Original Research Article

Alteration in Lipid Profile Before and After Yogic Exercises in Patients of Type II Diabetes

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ABSTRACT

Background: Dyslipidemia is a disorder of lipoprotein metabolism. A linear relation probably exists between lipid levels and cardiovascular risk. Yoga has beneficial health impacts on diseases like diabetes, hypertension, dyslipidemia, obesity etc.

Aim: To study the effect of Pranayama and certain Yogic Asanas on lipid profile

Materials and Methods: Lipid profile (total, LDL, and HDL cholesterol and triglyceride) was done before and after yogic exercises and analysed. Statistical analysis was done and results were obtained.

Results: In this study, there was a significant decrease in serum total cholesterol, triglyceride, LDL and increase in HDL cholesterol levels after 3 and 6 months of yogic exercise ($p < 0.05$).

Conclusion: Yogic exercise would give benefit to the patients by reducing serum cholesterol and triglyceride levels and improve the status of patients.

Key words: Dyslipidemia, LDL-c, HDL-c, Cholesterol, Triglycerides.

INTRODUCTION

Dyslipidemia is a disorder of lipoprotein metabolism, including lipoprotein overproduction or deficiency. [1]

Dyslipidemias may be manifested by elevation of the total cholesterol, the "bad" low-density lipoprotein (LDL) cholesterol and the triglyceride concentrations, and a decrease in the "good" high-density lipoprotein (HDL) cholesterol concentration in the blood. A linear relation probably exists between lipid levels and cardiovascular risk, so many people with "normal" cholesterol levels benefit from achieving still lower levels. [2] Consequently,

there are no numeric definitions of dyslipidemia; the term is applied to lipid levels for which treatment has proven beneficial.

Dyslipidemia is suspected in patients with characteristic physical findings or complications of dyslipidemia (e.g., atherosclerotic disease). Diagnosis is by measuring plasma levels of total cholesterol, TGs, and individual lipoproteins. Treatment involves dietary changes, exercise, and lipid-lowering drugs. [3,4]

Regular yogic practices help in the constructive development of body and mind. There are many forms of yoga mentioned in

the literature. ^[5] Popularity of yoga is increasing in India and abroad due to its beneficial health impacts on diseases like diabetes, hypertension etc. Yoga uses physical poses or Asana, Breathing Techniques or Pranayama, and Meditation to achieve better health, as well as spirituality. It may have role to shift the body and mind towards more parasympathetic state. Yoga may alter brain functions by altering the brain peptide and neuroendocrine functions. ^[6] In this recent era yoga is also used as a therapeutic tool for many chronic, psychosomatic and lifestyle related disorders such as dyslipidemia, hypertension, coronary artery disease, type - II diabetes, back pain and bowel syndrome etc.

So in this study we observed beneficial effects of 3 month & 6 months of Yogic exercise on various biochemical parameters (lipid profile) in patients of type II diabetes.

Aim:

To study the effect of Pranayama and certain Yogic Asanas on lipid profile

MATERIALS AND METHODS

The data was collected on 100 subjects with an age group of 40-60 yrs. Amongst these 60 were male subjects and 40 were female who attended the YLMP (Yoga Life Modification Programme). All the subjects were comparatively new to yogic practices. The study was conducted in Siddharth Garden, Aurangabad after an informed and written consent from all the participants. Study programme consisted of an integrated package of theory and practice session, 1 hour each day of a 7 days outpatient course, interrupted by a one day weekend break. This course was given to batches of 25 patients each at a time. Each batch was followed for the duration of 6 months.

The set of asanas and pranayama included in the course ^[6]

I. Humming in meditative posture-

Vajrasana (Thunderbolt Pose)/Padmasana (Lotus Pose)/Sukhasana (Easy Pose)

II. Loosening Exercises

Warm ups: starting from the head, working towards the toes.

1. Neck rolls
2. Shoulder rotation
3. Arm rotation
4. Elbow movements
5. Wrist movements
6. Finger movements
7. Waist movements
8. Knee rotation
9. Ankle rotation
10. Toe movements

III. Asanas

(a) Standing

1. Ardhakatichakrasana (lateral arc pose)
2. Padahasthasana (forward bend pose)
3. Ardhabhaktasana (backward bend pose)
4. Vrikshasana (tree pose)

(b) Sitting

1. Ardhamatsyendrasana (half-spinal twist pose)
2. Paschimatanasana (back stretch pose)
3. Konasana (angular pose)
4. Manduk asana (Frog pose)
5. Shashankasana (forward bending)

(c) Lying on stomach (prone)

1. Makarasana (crocodile pose)
2. Bhujangasana (cobra pose)
3. Dhanurasana (bow pose)
4. Śalabhāsana (Backbend)

(d) Lying on back (supine)

1. Uttitapadasana (straight leg raising)
2. Sarvangasana (shoulder stand pose)
3. Matsyasana (fish pose)
4. Pavanmuktasana (wind relieving pose)
5. Setubandhasana (bridge pose)
6. Markatasan (twisting pose)

IV. Deep Relaxation In Shavasana (Corpse Pose)

V. Pranayama (Breathing Practices)

Bhastrika (rapid breathing)

Bhramari (honeybee sound during expiration)
 Anuloma-Viloma(Alternate Nostril Breathing)
 Kapalabhati pranayam(short and strong forceful exhalations and inhalation happens automatically)
 Udgeeth Pranayama(chanting of the Om mantra)

VI. Quick Relaxation In Shavasana (Corpse Pose)

VII. Humming In Meditative Posture-

Vajrasana (Thunderbolt Pose)/Padmasana (Lotus Pose)/ Sukhasana (Easy Pose)

Detail present and past history of these patients was taken to rule out common medical problems and restrictions for the study interventions. Lipid profile (Total cholesterol, Triglycerides, HDL, VLDL, LDL) was done by RXL 300 Random access fully autoanalyser.

In order to determine effectiveness of yogic exercise, the data before and after 3 and 6 months programme were analysed by (Statistical Packages for Special Sciences) SPSS version 20 using paired t test. A p value <0.05 was considered as statistically significant.

RESULT

At the end of the study, There is a significant decrease in serum cholesterol levels, serum triglyceride levels as well as serum LDL levels of patients after 3 months of yogic exercise as compared to before exercise levels (p=0.000). Also there is increase in serum HDL levels as compared to before exercise levels (p=0.000) as shown in figure 1.

There is a significant decrease in serum cholesterol levels, serum triglyceride levels as well as serum LDL levels of patients after 6 months of yogic exercise as compared to before exercise levels (p=0.000). Also there is increase in serum

HDL levels after 6 months of yogic exercise as compared to before exercise levels (p=0.000) as shown in figure 2.

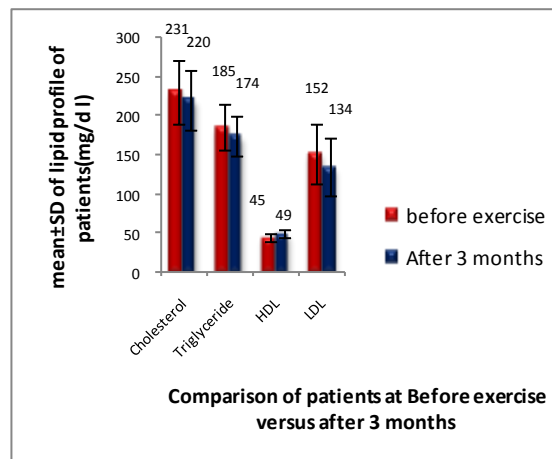


Figure 1: Comparison between lipid profile levels of patients at Before exercise and after 3 months of yogic exercise

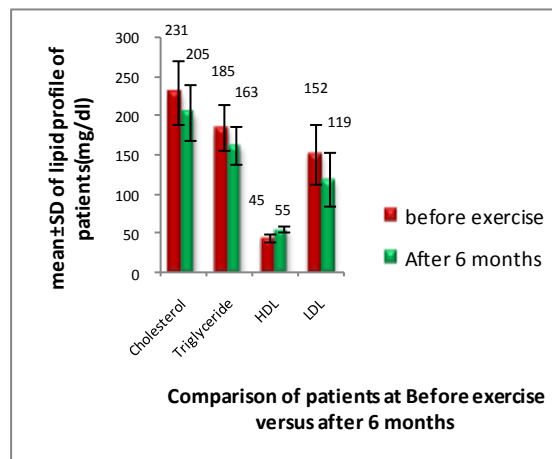


Figure 2: Comparison between lipid profile levels of patients at Before exercise and after 6 months of yogic exercise

DISCUSSION

In this study we observed significant decrease in the total cholesterol, triglycerides, LDL levels and an increase in HDL levels. Similar observations were found by short duration studies of Malhotra (2004), Singh (2008). [6,7] Sahay (2008) and Bijlani (2005) reported a significant reduction in free fatty acids, LDL, VLDL and an increase in HDL. [8,9] The improvement in the lipid profile after yoga

could be due to increased hepatic lipase and lipoprotein lipase at cellular level, which affects the metabolism of lipoprotein and thus increase uptake of triglycerides by adipose tissues (Delmonte *et al*, 1985; Tulpule *et al*, 1971).^[10,11] There was no significant change in HDL levels in the present study. Similarly in a study conducted in Haridwar, to see the effects of Short term health impact of a yoga and diet change program on obesity found that there was decrease in the HDL levels which is not a favourable outcome.^[12,13] They reasoned that the decrease in HDL levels may more likely be due to a change in diet (with a decrease in saturated and monounsaturated fat and animal-source protein) rather than related to the practice of yoga.

CONCLUSION

Yogic exercises significantly benefits the diabetes patients with their lipid profile levels. In addition to normal medical therapy, Yogic exercises would give benefit to the patient by reducing cholesterol and triglyceride levels as well as increasing HDL levels and improve the status of patients in terms of use of less medicine, improvement of physical well being, improvement in mental alertness and activity and leading to complication free life. Long term yogic exercises are more useful than short term exercises in reducing the complications caused due to diabetes.

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