

Lipid Profile and Lipid Peroxide Level Changes in Practitioners of Anapanasati Meditation

Shilpa D.¹, Smilee Johncy S.², Ashwini S.³, Suresh Y. Bondade⁴

Abstract

Aim: The aim of present study was to study the effect of Anapanasati meditation on lipid profile and lipid peroxide levels among short term meditators (practicing meditation for less than 6 months), long term meditators (practicing meditation for 6 months to 5 yrs) and nonmeditators. *Method:* The study included 30 short term, 30 long term meditators & 30 non meditators. To assess lipid profile & lipid peroxide levels 6ml of blood was venous blood was collected with aseptic precaution. Serum total cholesterol, HDL, LDL, triglycerides were estimated by their respective reagents. Lipid peroxide level was estimated by measuring serum malondialdehyde (MDA) levels. One way ANOVA was used for simultaneous multiple group comparison followed by Post-hoc Tukey's test for group-wise comparisons. *Results & Conclusion:* On analysis of results, it was found that there was significant decrease in total cholesterol ($p < 0.001$) and LDL-cholesterol ($p < 0.001$), along with significant increase in HDL-cholesterol ($p < 0.01$) in long term meditator and short term meditators when compared to non meditators. And similar significant difference was found between long term meditators and short term meditators. *Results:* showed that there was significant reduction in triglycerides ($p < 0.001$) in long term meditators compared to short term meditators and non-meditators. On analysis of results of lipid peroxidation it was found that there was highly significant ($p < 0.001$) reduction in the level of lipid peroxides in long term meditators and short term meditators compared to non meditators. And also there was highly significant ($p < 0.001$) reduction in the level of lipid peroxides in long term meditators compared to short term meditators. It was concluded that meditation improves lipid profile and decreases lipid peroxide levels. Improvement continues further by increasing the duration of meditation.

Keywords: Meditation; Lipid Profile; Lipid Peroxides.

Author's Affiliations:

^{1,3}Assistant Professor
²Professor ⁴Professor & Head,
Department of Physiology, JJM Medical
College, Davangere, Karnataka 577004,
India.

Corresponding Author:

Shilpa D.,
Assistant Professor,
Department of Physiology,
JJM Medical College,
Davangere, Karnataka 577004, India.
E-mail: meetrshilpa@gmail.com

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Introduction

Modern man is the victim of stress and stress related disorders. As stress is unavoidable, these days a simple, inexpensive yet powerful age-old technique, meditation is being increasingly used and studied [1-5]. Although much research work has been done on meditation most of them are on diseased condition and on few specific types of meditations like- Transcendental meditation [3], Rajayoga meditation [5], and OM meditation [6]. Other forms of meditation are not extensively studied. Most of the studies on meditation are on diseased states [3,6]. There are less studies to see effect on healthy individuals. And also

most studies are on yoga where meditation will be coupled with practice of set of asanas and pranayamas [9]. There are less studies to see effect of meditation alone without incorporating asanas and pranayamas. In Anapanasati meditation, meditator sits in comfortable sitting posture, with eyes closed, legs crossed and arms clasped. Meditator consciously concentrates on his breath. So it is simple form of meditation on breath [7,8].

Hence, present study is undertaken to study the effect of Anapanasati meditation on lipid profile and lipid peroxides among healthy meditators and to compare the above parameters with that of non meditators, with a strong hope that early precaution can be taken to handle stress, by practicing

meditation to reduce the incidence of stress-related diseases of mind and body by bringing ancient technique- meditation to modern clinic.

Objectives

- To study the effect of Anapanasati meditation on lipid profile (Serum total cholesterol, triglycerides, HDL, LDL) and lipid peroxides (malondialdehyde -MDA levels).
- To study the relation between effect of Anapanasati meditation on above mentioned parameters and duration of practice of meditation.
- To compare all the parameters between short term meditators, long term meditate and nonmeditators.

Methodology

The present study was conducted in Department of Physiology, JJM Medical College. It was carried out from April 2011 to March 2012. The study was undertaken to study the effect of Anapanasati Meditation on lipid profile and lipid peroxides among short term meditators and long term meditators and to compare with that of non meditators.

Study group

In this study, 60 meditators were taken from Karnataka Pyramid Dyana Prachara Trust®. Davangere Branch. This group was divided into 30 each based on duration of practice Anapanasati meditation. Short term meditators: meditating for 6 months to 5 years Long term meditators: meditating for more than 5 years.

Control group

Thirty normal age & sex matched subjects from general population who were not exposed to any meditation or relaxation technique were included and were labelled as nonmeditators. Dietary habits and physical exercise were matched between study and control groups.

Inclusion Criteria

- Healthy males and females in the age group of 45 to 60 years.

- Short term meditators were those who had been practicing meditation from 6 months to 5 years.
- Long term meditators were those who had been practicing meditation for more than 5 years.
- Age and sex matched healthy individuals not exposed to any meditation or relaxation technique were included as controls.

Exclusion Criteria

- Age below 45 years and above 60 years.
- Presence of obesity, hypertension, diabetes mellitus, ischemic heart disease, congestive heart failure.
- Chronic smokers and chronic alcoholics.

Method

Meditators practice Anapanasati meditation, in the meditation centre regularly for 1 hour everyday between 6.A.M. to 7A.M.

Process of meditation: ANA means-breath in, PANA means-breath out, SATI means-to be with. ANAPANASATI means – BE WITH THE BREATH [8-11]. A quiet place is chosen.,any comfortable sitting position can be taken. Spine should be comfortable as possible, hands should be clasped, legs should be crossed and eyes should be closed.

Notice your breathInhale slowlyExhale slowlyLet your breath sink in and outYour breath is a rhythm of calmFollow your breathBe stillBe your breath. Be still....be still....be still

The nature of test was explained to them and informed consent was obtained. The procedure was in accordance with the ethical standards of committee of the institute. Collection of data was done between 9.00 am to 12.00 pm. Sufficient time was given (15 min) for the subjects to mentally and physically relax before doing the test. Abriefhistory, general physical examination and clinical examination of all the systems were done to exclude medical problems and to prevent confounding of results.

Recording of Anthropometrical Parameters, like height, weight, BMI (Body mass index) were measured using standard instruments.

To assess lipid profile & lipid peroxide levels 6ml of blood was venous blood was collected with aseptic precaution. Serum total cholesterol, HDL, LDL, triglycerides were estimated by their respective

reagents from Biochemistry lab JJMMC Davangere. Lipid peroxide level was estimated by measuring serum malondialdehyde (MDA) levels using: Nadiger et al method in the same lab.

Statistical Analysis

The results were expressed as Mean ± Standard deviation for continuous data, and Number and Percentage for discrete data. One way ANOVA was used for simultaneous multiple group comparison followed by Post-hoc Tukey's test for group-wise comparisons. Categorical data was analysed by Chi-square test.

SPSS version 16 software was used for all the analysis.

1. p Value > 0.05 is taken as 'not Significant'.
2. p Value < 0.05 is taken as 'Significant'.
3. p Value < 0.001 is taken as 'Highly Significant'

Results

Analysis of the basic characteristics of 90 subjects, showed no statistically significant difference in age, sex distribution, BMI, physical activity, diet. when values of all three group were compared. None of them were smokers or consumed alcohol (Table 1,2). Sedentary: No physical exercise; Non sedentary: Regular physical exercise every day.

Analysis of Lipid profile

On analysis of results, it was found that there was significant decrease in total cholesterol (p<0.001) and LDL-cholesterol (p<0.001), along with significant increase in HDL-cholesterol (p<0.01) in long term meditator and short term meditators when compared to non meditators. And similar significant difference was found between long term meditators and short term meditators.

Table 1: Comparison of Lipid profile between Long term, Short term and Non meditators

Groups		TC(mg/dl)	HDL-C (mg/dl)	LDL-C (mg/dl)	TG(mg/dl)
Long term		155.6 ± 7.6	55.5 ± 5.4	80.6 ± 8.8	114.6 ± 11.2
Short term		181.8 ± 13.9	49.4 ± 4.9	102.5 ± 16.7	149.7 ± 20.4
Non - med.		220.6 ± 35.5	45.2 ± 7.5	144.6 ± 39.8	153.7 ± 14.4
Anova	F	63.84	21.81	49.15	55.61
	P	<0.001	<0.001	<0.001	<0.001
Groupwise comparisons (P - values)	1 - 2	**	*	*	**
	1 - 3	**	*	**	**
	2 - 3	**	*	**	0.58, NS

All the values are expressed as Mean ± SD
 Multiple group comparison: **One way ANOVA, F-Test**
 Groupwise comparison: **Post - hoc Tukey's test**
 * p< 0.05 S-Significant, ** P < 0.001 HS- Highly Significant, P>0.05 NS- Not Significant

Table 2: Comparison of Lipid peroxides between Long term, Short term and Non meditators

Groups		Lipid Peroxide(mg/dl)
Long term		1.82 ± 0.46
Short term		2.46 ± 0.30
Non - med.		3.02 ± 0.53
Anova	F	57.25
	P	<0.001
Groupwise comparisons (P - values)	1 - 2	**
	1 - 3	**
	2 - 3	**

All the values are expressed as Mean ± SD
 Multiple group comparison: **One way ANOVA, F-Test**
 Groupwise comparison: **Post - hoc Tukey's test**
 * p< 0.05 S-Significant, ** P < 0.001 HS- Highly Significant, P>0.05 NS- Not Significant

Results showed that there was significant reduction in triglycerides ($p < 0.001$) in long term meditators compared to short term meditators and non-meditators. There was no significant decrease in triglycerides in short term meditators compared to non meditators. ($p > 0.05$)

On analysis of results of lipid peroxidation it was found that there was highly significant ($p < 0.001$) reduction in the level of lipid peroxides in long term meditators and short term meditators compared to non meditators. And also there was highly significant ($p < 0.001$) reduction in the level of lipid peroxides in long term meditators compared to short term meditators.

Discussion

Improvement in lipid profile with increase in duration of meditation in our study is consistent with studies done by Vyas R et al. [5], Sayyed A et al. [9], Subramanian S et al. [12]. The improvement in the lipid profile parameters after meditation could be due to increased hepatic lipase and lipoprotein lipase at cellular levels, which affects the metabolism of lipoprotein and thus increase uptake of triglycerides by adipose tissues [9].

Meditation is believed to gradually diminish sympathetic dominance, resulting in better balance between the sympathetic and the parasympathetic [1]. By modifying the state of anxiety, meditation reduces stress induced sympathetic overactivity [5], which in turn improves lipid profile. Meditation is described as a wakeful hypometabolic state [6]. Metabolic effects of meditation include a decreased adreno-cortical activity and long term decreased cortisol activity and long term decreased cortisol secretion and decreased thyroid – stimulating hormone. This may be another cause of decrease in serum total cholesterol, triglycerides and LDL cholesterol observed in our study. Improvement in lipid profile may be mediated through interaction between autonomic nervous system and endocrine system. There is shift in autonomic balance towards relative parasympathetic predominance and reduction in secretion of stress hormones like epinephrine, nor-epinephrine and cortisol.

In present study there was no significant decrease in triglycerides in short term meditators, but the decrease was significant in long term meditators compared to nonmeditators. This emphasizes the effect of duration of meditation. Improvement in long meditators is due to further

alteration in physiological process involved. Similar to present study, in study done by Syyed et al. [9] there was no significant decrease in triglycerides values after Sudarshankriya yoga. Change in other lipid profile parameters was similar to present study. Our study results on lipid peroxide levels is consistent with studies done by Schneider RH et al. [13], Yadav RK et al. [14], Agte et al. [15], Kim DH et al. [16].

Meditation reduces stress by producing relaxation response - a self induced reduction in activity of sympathetic nervous system, the opposite of hyperactivity of central nervous system associated with stress response. Psychological stress has been shown to increase oxidative stress with increase in production of reactive oxygen species (ROS) and are implicated in etiology of stress related disorders. Meditation decreases production of ROS and increases antioxidant levels. So there will be decrease in oxidative stress shifting the balance between oxidant-anti oxidant equilibrium in favour of antioxidants [13-16].

Hence there will be decreased lipid peroxidation and hence decreased formation of malondialdehyde formation, which is a marker of lipid peroxidation.

Long term Transcendental [13] and Zen meditators [16] have been showed to diminish oxidative stress seen by a reduction in lipid peroxidation and biphoton emission. Glutathione level and activity of antioxidant enzymes have been facilitated in yoga and Sudarshankriya practitioners [15]. Possibly the same mechanism is responsible for results of present study. To summarize, our study shows that Anapanasati meditation confers significant improvement on lipid profile and decreases lipid peroxidation. Benefits continued to improve further with long term meditation.

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