



Effect of Yoga Therapy on Cellular Rejuvenation and Improvement of Concentration (A Pilot Study)

KEYWORDS

yoga therapy, oxidative stress, single object meditation measurement

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ABSTRACT *Yoga therapy is the therapeutic implementation of yoga, so that one can cure and prevent various diseases. In the present situation people are under threat of many lifestyle diseases, non communicable diseases etc.. due to various causes. According to yoga the physical disorders are due to accumulated impurities in our body. These impurities are capable to make changes in our intellect also. The present study shows the unique quality of yoga to purify the body by reducing the free radicals and improve the ability of mind to concentrate in single object.*

Introduction

Yoga therapy is the threefold therapeutic system that prevents, promotes and cures various diseases and disorders through practice of yoga. The yogic practices concentrate on purification of the body and mind. Through this kind of integrated and holistic approach one can overcome all kinds of afflictions in life. The Sage Pathanjali defines yoga as, systematic practice for purifying one's mind, intellect and body.¹

In the present scenario, we are under threat from various diseases, life style disorders, and non communicable diseases etc. Major causes of all these diseases are improper lifestyle and stress. Excessive stress is the major causes of hormonal imbalances and chemical imbalances in our body. It disturbs the metabolic activities in our body. According to yoga the first obstacle in human life is diseases. The disease occurs due to imbalance in the body function. It causes the accumulation of impurities in our body.² Hatha yoga explains when body function becomes imbalanced it reflects in our mental and intellectual level. Therefore the concept of body rejuvenation means the rejuvenation of the physical body, mind and our intellect.

Oxidative Stress

During an immune response in the body, there is an increase in production of reactive oxygen species (ROS), also known as free radicals. There is a balance in the body between ROS production and antioxidant defenses against the damage they can do. Problems occur when the balance is upset, which is known as "oxidative stress," defined as "... a process in which the natural balance between pro-oxidants and antioxidants is shifted toward the oxidant side to cause biological damage"³. When the oxidative stress becomes more in our body cell damages and accumulation of the toxic items in the body becomes increased. It leads so many pathological conditions including cancer etc. Therefore we can consider excessive oxidative stress as one of the measurable toxic reaction in our body.

Mental stress: (chitta vikshepa)

In the present social atmosphere there are many causes which can increase the mental stress in our life. Gradually stress triggers so many pathogenesis in our body. One of the symptoms to identify the stress level is increased citta vrttis (mental dispositions) in the mind.⁴

According to classical yogic texts by practicing yoga one can purify the physical body as well as mind and intellect. Therefore this study is based on the concept of "kayendriya suddhi"⁵

This Study seeks to record the effect of yoga therapy on overweight people by measuring their lipid peroxidation levels before and after a 30 days of yoga therapy and contrasting it with a group not doing yoga, whose lipid peroxidation levels will be also recorded for the corresponding period of time. Along with that the improvements to tame the mental disturbance and improvements in the concentration also considered under the study.

Obese people have been identified as they are suffering from "oxidative stress" and impact of yoga, even for a short period can indicate the beneficial effect of yoga in reducing this "imbalance" between pro-oxidants and antioxidants which has been known to be a cause for diabetes and obesity etc...

It is known that, Polyunsaturated fatty acids on a cell wall when attacked by ROS, breakdown into harmful products such as malondialdehyde (MDA) and conjugated dienes, which can be measured in the blood. Increases in these by-products of lipid peroxidation indicate an increase in ROS activity. Therefore certainly we can consider increased oxidative stress as one of the toxic item which can affect the balanced functions in our body.⁶

So before and after the 30 days camp, Lipid peroxidation levels will be measured using the MDA (malondialdehyde) test along with FBS, PPBS, TC, TG, HDL, LDL, and VLDL. Also to measure the ability of concentration we have applied a standardized method Called SOMM (Single

Point Meditation Measurement)

Objectives of the study

To measure the

- Impact of yoga therapy on overweight
- Impact of yoga to reduce free radicals and morbid items in the body
- To analyze the improvements of the concentration

Materials and Methods

Present study was conducted to assess the effect of selected yogic practices on the subjects of overweight people, aged between 30 and 65 years. There were 16 female and 14 male (total 30) volunteers with overweight. Subjects were allocated to Experimental and Control groups and they were new to yogic practices. The Control group continued with their normal lifestyle. To The Experimental Group we implemented one month of yogic practices with yogic way of diet. The yoga practices conducted in the MRPL ladies club auditorium in the MRPL Township. The Experimental group was subjected to an experimental treatment in which a set of twenty one yogic practices were performed on six days per week between 6 pm to 7 pm. This practical session utilized a standard sequence of selected kriyas, Asanas, Pranayamas and Relaxation Techniques, taking appropriate precautions for patients with Hypertension and back pain. The sample was analyzed under the supervision of experts in the biochemistry. A Paired "t" test was employed in the study to analyze the significance of the result statistically.

Hypotheses

The null hypothesis for the present study formed as

1. "There is no significance difference in oxidative stress of experimental and control group, after the study"
2. "There is no improvement in concentration of experimental and control group, after the study"

Selection criteria:

Subjects –overweight people as indicated by their BMI above 27.

With the age group between 30 to 65 years, including both male and female.

Parameters

1) BMI (weight divided by height meter square.)

2) FBS and PPBS

Blood collected from the subjects for FBS and PPBS with anti coagulant. After collecting the plasma both FBS and PPBS glucose level will be analyzed by GOD- POD method.

3) Lipid profile

The serum collected from the blood which took without anti coagulant and will be analyzed TC, TG, HDL, VLDL, LDL cholesterol level.

4) MDA test.

The serum collected without anti coagulant will be used for MDA test in TBA-TCA method. All the parametric tests will be done before and after the yoga therapy.

5) SOMM (Single Object Meditation Measurement)

Single Object Meditation Measurement is a kind of self reporting systematic method to measure the ability of an individual to restrain his mental modifications (citta ritti) by concentrating on a single object. The same is measured using a self controlled stop watch based on subject response method. Single object meditation mentioned in patanjali's yogasutra. It explained as the solution for mental confusion and stress. ("tat pradhisedhartham ekatvatva abhyasa") based on this concept one can observe their mind. Improvement in the ability to concentrate indicates improvement in mental health.

Control group.

Along with the experimental group, another group of same number of people conforming to the same selection criteria will form a control group. All the tests will be repeated in the control group, at corresponding period of time.

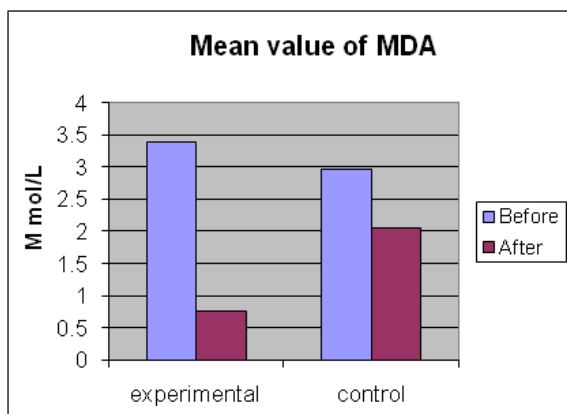
Yoga therapy Implementation

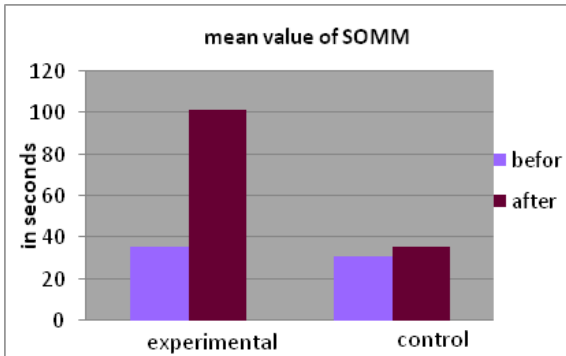
The following Yogic practices were given to Experimental group for a period of one month.

1. Swastikasana
2. Vajrasana
3. Suptavajrasana
4. Agnisara
5. Tadasana I, II
6. Trikonasana
7. Parswakonasana
8. Pascimotthanasana
9. Purvotthanasana
10. Ardha badha padma padma pascimotthanasana
11. Janusirsasana
12. Mahamudra
13. Pavanamuktasana
14. Bhujangasana
15. Dhanurasana
16. Viparitarani
17. Uttanapadasana
18. Ujjayi
19. Anuloma viloma
20. Bhastrika
21. Soham meditation
22. Yoganidra .

Statistical analysis of results

Graphical Representation of the Mean Value of Parameters in Experimental and control group





| Experimental group statistical analysis | | | | | | | | |
|---|------------|---------------|---------------|--------------------|---------------------|----------------|-----------|--------------|
| SL No: | Parameters | MEAN | | Standard Deviation | | t- state value | p-Value | Significance |
| | | PRE | POST | PRE | POST | | | |
| 1 | MDA | 3.393333 | 0.766156 | 2.34171 692354 | 0.43935 424204 | 4.257837 | 0.000398 | H.S |
| 2 | Weight | 77.5533 33 | 76.2133 33 | 8.16795 60525 | 8.376999 16438 | 7.448825 | 1.56E-06 | H.S |
| 3 | T.C | 249.2333 | 180.1068 | 55.99274 19404 | 34.03731 99591 | 5.367125 | 9.93E-05 | H.S |
| 4 | TG | 130.152 | 121.122 | 51.8224 483212 | 82.461393 939974 | 0.602848 | 0.55625 | N.S |
| 5 | HDL | 39.092 | 44.63533 | 9.18068 415207 | 15.84937 58552 | 1.25418 | 0.230313 | N.S |
| 6 | LDL | 184.0576 | 111.0576 | 53.7198 580601 | 31.57535 13836 | 4.989525 | 9.92E-05 | H.S |
| 7 | FBS | 92.07933 | 86.166 | 29.5218 29116 | 21.31264 44863 | 1.320081 | 0.207986 | N.S |
| 8 | PPBS | 112.5653 | 106.936 | 51.10926 67723 | 42.52986 1862 | 0.709224 | 0.489829 | N.S |
| 9 | SOMM | 35.53333 | 101.8667 | 18.06681 | 33.90505 | -8.0101 | 1.349E-06 | H.S |

| Control group statistical analysis | | | | | | | | |
|------------------------------------|--------|----------|--------------|-------------------|--------------------|----------------|----------------|--------------|
| | | PRE | POST | PRE | POST | t. state value | p. state value | significance |
| 1 | MDA | 2.957 | 2.057895 | 1.31700 07593 | 0.86818 258448 | 1.589959 | 0.146307 | N.S |
| 2 | Weight | SL No: | Parameters | MEAN | Standard Deviation | t- stat value | p-Value | Significance |
| 3 | T.C | 268.26 | 242.15 | 67.3268 007557 | 56.1524 540871 | 1.21221 | 0.256293 | N.S |
| 4 | TG | 135.452 | 160.767 | 46.0790 201719 | 63.5052 210452 | -1.16617 | 0.273517 | N.S |
| 5 | HDL | 49.012 | 43.79 | 21.71548 54885 | 14.2967 027667 | 0.7681 07 | 0.462101 | N.S |
| 6 | LDL | 174.0356 | 168.706 6 | 67.1320 646189 | 49.25422926 | 0.260512 | 0.800331 | N.S |
| 7 | FBS | 86.769 | 73.997 | 20.02299 70284 | 13.562231 0112 | 1.459207 | 0.17851 | N.S |
| 8 | PPBS | 101.941 | 111.361 | 23.028228 5467 | 47.38947 24596 | -0.62953 | 0.544649 | N.S |
| 9 | SOMM | 31.1333 | 35.9333 | 11.77083 | 11.31665 | -1.656 | 0.12 | N.S |

Discussion.

The present study indicates that the overweight subjects in experimental group reduced the oxidative stress, weight, lipid profile, and blood sugar level and shows improvement in concentration. The significant reduction in MDA, weight, TC, and LDL is the clear evidence that one month yoga therapy reduced the cytotoxic items like free radicals in the overweight subjects. The reduction in the MDA is from 3.393333 to 0.766156, with $p=0.000398$ which is <0.05 the level of significance. The Weight reduced from 77.553333 to 76.21213333 $p=0.00000156$ which is <0.05 the level of significance, TC reduced from 249.2333 to 180.1068, $p=0.0000993$, which is <0.05 the level of significance, TG reduced from 130.152 to 121.122, $p=0.602848$ which is not significance even though the mean value is reduced. In the case of HDL also it increased from 39.092 to 44.63533, $p=0.230313$, not significant. LDL reduced from the mean value of 184.0576 to 111.0576, $p=0.0000992$, which is <0.05 the level of significance (HS). The mean value of FBS reduced from 92.0793 to 86.166, $p=0.20798$ but not significant. PPBS reduced from the mean value of 112.5653 to 106.936, $p=0.489829$. Ultimately the aim of yoga is to tame the mind. Here in this study the ability of concentration i.e. SOMM increased from 35.5333 to 101.8667 seconds with the $p=0.000001349$ which is <0.01 the level of highly significant.

Based on above explained results, we can infer that the regular practice of yoga can detoxify the body. Practice of yoga with yogic way of diet could reduce the excessive free radicals in the body. It indicates that yoga can boost the molecular repairing mechanisms in the body. Reduction in the lipid peroxidation is the indication of reduction in the cellular damaging mechanism. therefore it is evident that yoga practice may help to prevent and cure the diseases like diabetes, arthritis, and other degenerative diseases. Since there are established evidence that excessive free radicals is one of the important triggering factor behind various diseases practice of yoga can play a major role in the management of these types of various diseases.

Significant changes in the cholesterol level and blood glucose level is the clear evidence of improvements in the metabolic action and better circulatory function in the body. The result of blood glucose level also indicates that yoga practice can improve the glycogenesis process. yogic practice can contribute to manage these categories of diseases.

Significant improvement in SOMM shows the evidence of improvement in the concentration and relaxation in the mind. There is more evidence that proves the alpha waves passing the signals more to activate the rejuvenating

mechanisms. The concentration and relaxation in the mind improves the alpha waves¹⁰. Total improvements in the parameter shows that improvements in the psycho-physiological functions in the body. The improvements in SOMM shows that the ability of restrain the mental thoughts. (Citta vrtti) is increased. It reduces the stress and anxiety.

The reduction in the body weight indicates reduction in the fat on adipose tissue. The Reduction in the total Cholesterol indicates the improvement in the metabolism and regularization in the fat deposition. The LDL and TG cholesterol consider as the bad cholesterol in the body. The one month yoga practice along with ideal calorie diet reduced triglycerides and excessive cholesterol in the body. The increased mean in the HDL shows that yoga can improve the level of HDL. Like that in the case of FBS and PPBS also we can see the improvement. Total improvements in the parameter shows that improvements in the psycho-physiological functions in the body.

The improvements in SOMM shows that the ability of restrain the uncontrolled excessive mental though (citta vrtti). It is the clear indication of improvements in the mental health.

Above explained findings are the clear evidence of significant changes in the experimental group after one month practice of yoga so that the null hypothesis are rejected

In the control group it can be see, that a little improvement in all the parameters, but not significantly. In the control group reduction in the oxidative stress very less. Like that increasing the TG reduction in the TC, HDL, and LDL indicates that the Psycho-physiological functions of control group are not improved. Also improvement in the SOMM is but not significantly.

It indicates that the improvements which show in the experimental group are due to the one month yoga practice.

Conclusion.

From above explained details it can be concluded that

- a. Yoga practices can detoxify and rejuvenates the body by eliminating the free radicals and improve the functions of antioxidant.
- b. Yoga therapy reduces the cholesterol and improves the metabolic and circulatory functions.
- c. Yogic practices can improve the ability to concentrate and tame the mind so that the practitioner can maintain mental health.
- d. So that the yoga therapy may be helpful to prevent the degenerative diseases

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