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Effect Of Yoga On Perceived Stress And Pulmonary Function In High Stressed Postmenopausal Women

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ABSTRACT

Postmenopausal phase is characterized by a continuous decline in ovarian function due to which women are vulnerable to stress and health complications including the efficiency of respiratory muscles. Hormonal therapy causes complications which has resulted in search for various alternative therapies to improve the quality of life. Yoga is one such alternative therapy. There are very few scientific studies regarding the effect of yoga on stress and respiratory parameters. The present study was aimed to investigate the effect of one year yoga therapy on pulmonary function tests and perceived stress in postmenopausal women. The study was implemented after obtaining the consent from the Institutional ethical Committee. Informed consent was obtained from all the participants. Newly recruited postmenopausal women (48-60 years) having the high stress level (PSS score > 25) were taken for this study. Vital capacity (VC), FVC, FEV1, FEV1 ratio, PEFR, FEF 50, were measured with the help of computerized Vitalograph (Pneumotrac). After one year of yoga therapy perceived stress scale and the respiratory parameters were again analyzed. The parameters obtained were grouped into before one year yoga therapy (Group I) and after one year yoga therapy (Group II). Yoga therapy for one year showed the significant P< (0.0001) improvement in the stress reduction and the respiratory parameters compared to the control group. This study clearly demonstrates the effectiveness of one year yoga therapy in decreasing stress and improvement in respiratory parameters .Yoga is easy, safe, non-expensive alternative therapy helping the postmenopausal women and this could be encouraged in the regular management in improving the overall quality of life.

Keywords

Pulmonary function tests; PSS score, stress;Yoga; Menopause

Introduction

Menopause is marked as an normal part of aging and represents the culmination of a woman's reproductive period . It may also be defined by a decrease in hormone production by the ovaries. Signs of psychological stress seem to be amplified in post-menopausal women which is because of the hormonal and metabolic disturbances Schiff, et al (1979). Exposure to Stress is an important element in the development of many diseases Utian WH, et al (2001) . Various studies have showed the evidence of psychological stress related with a wide range of health problems including respiratory problems (Reynolds M, 2008; Cohen, S et al , 2016) . Pulmonary Function tests provides the outcome of bronchopulmonary functions. Pulmonary function test is considered a key indicator of physical fitness. Available reports on respiratory health in post-menopausal women is mystifying and the role of female hormones on the airways is unclear (Songür N, 2002; Amaral a et al 2016). The Perceived Stress Scale (PSS) is extensively used

in the assessment of psychological stress. It mainly reflects the situations in one's life are seemed as stressful. Many studies have proved the validity and reliability of the PSS in a broad range of samples (Cohen S et al 1983; Maroufizadeh, S et al 2014)

Yoga mainly includes the components of philosophy of life. The life style changes through yoga mainly focus on the improvement is body, mind and also creates impact on day to day living. In the recent era, the

benefits of yoga has been spread in many parts of the world. Studies has been focused on the effect

Yoga	Time
Prayer	1 minute
Mild warm up exercise (Stretching exercise)	10 minutes
Suryanamaskara	15 minutes
Asanas: Shavasana, Naukasana, Halasana, Dhanurasana,Bhujangasana, Pavanmuktasana	35 minutes
Pranayama:Nadi-sodhan, Bhastrika, Kapalbhati,BahyaPranayamAnulomVilom, Bhramari pranayama	15 minutes
Meditation on Omkar / laughing exercise	5 minutes

of yogasanas in menopause (Avis NE et al 2014 ; Booth-LaForce C, 2007) . The most commonly performed Yoga practices are includes different asana, pranayama, and dhyana. Positive approaches towards management of stress might help women to handle not only with menopausal problems and also with the age related changes . Long term effects of yoga practices are very less in the literature. The present study is mainly focused to study the effect of one year yoga on perceived stress scale and its corresponding impact on respiratory functions in menopausal women

Methodology

This study is a randomized controlled trial in postmenopausal women recruited in one center in Mangalore after obtaining the consent from the Institutional Ethical Committee (IEC KMC MLR 06-18/116).The purpose of this study was explained and written approval of each individual was obtained.

Experimental Design

Post-menopausal women (48-60 years) who joined for the yoga class were randomly selected and perceived stress scale was analyzed. The perceived stress score above 25 were considered as high stress category. Only those women having high stress were taken in this study. Postmenopausal women. Post-menopausal women having the history of cardiovascular vascular and respiratory diseases were excluded from the study. The respiratory parameters such as Vital capacity, FVC, FEV1, FEV1 ratio, PEFR, FEF 50, were measured with the help of Vitalograph (Pneumotrac) (Booth-LaForce et al, 2013). The women in the study group who failed to achieve 80% attendance during the yoga schedule were excluded from the study. They practiced yoga regularly as per the yoga therapy schedule. Yoga was strictly under the supervision of yoga teacher.

Yoga Intervention:

All the subjects had to practice yoga for 1hour, 20 minutes daily, five days a week between 4:00 pm to 6:00 pm. Procedure of daily yoga sessions are as follows. The subjects were informed about the procedures in brief and were asked to relax physically and mentally for 10 minutes. The yoga practice (1 hour-20 minutes) schedule consisted of Pranayama and Asana, which was concluded by meditation and prayer as follows:

Instructions to do yoga was done by certified yoga instructors who had at least 5 years of yoga teaching experience. The intensity of yoga exercise was determined by the instructors in order to provide a progressive level of challenge to the subjects. The performance of the subject was continuously supervised by the attending yoga instructor. All the yogic exercises were

stated to be suitable for the post-menopausal yoga beginners and senior individuals included in this study. In this study, 100 postmenopausal participants were randomized and 30 participants finally completed the study by doing regularly doing yoga for one year under constant supervision. The datas were grouped as before one year yoga therapy (Group I) and After one year yoga therapy (Group II)

Measurement of respiratory parameters

A portable, computerized spirometer was used and best of three readings was considered Mooventhan A & Khode, V. 2014) . The parameters recorded were: forced vital capacity (FVC); FEV in first second (FEV1); FEV1 ratio; peak expiratory flow rate (PEFR); mean forced expiratory flow (FEF) 50% were observed . For better understanding of the observed lung function test values, the software installed in the spirometer also calculates and displays the predicted values of pulmonary function test at the same time as actual values. These predicted values are derived from average values of a large population of healthy subjects .

Perceived stress scale measurement

The Cohen PSS is 10 item scale, each item is rated on a five-point scale ranging from never (0) to almost always4. Positively worded items are reverse scored, and the ratings are summed, with higher scores indicating more perceived stress. Scores above 25 was considered as high stress (Cohen, S et al , 2016; Westberg L 2008).

Data Analysis

Statistical analysis was done using one way ANOVA following which post hoc test to compare mean between the groups using SPSS version 18.0 (SPSS , Chicago, IL, USA). Data were expressed in mean ± standard deviation. Significant level was set as $P < 0.05$.

Results

The perceived stress scale scores significantly decreased in the Group II (P<0.0001) when compared to Group I (Table- 1). Further, regular yogic exercise and pranayama significantly showed the improvements in the respiratory parameters (Table- 2) such as VC (P<0.001), FVC (P<0.0001), FEV1(P<0.05), PEFR (P<0.05), FEF50 (P<0.001) in the postmenopausal women practicing yoga for one year (Group II)

Table 1: Perceived stress scale before and after yoga

Parameters	Group I (Before One year yoga therapy)	Group II (After One year Yoga therapy)
PSS score	28.55±1.11	15.25 ±2.12***

P <0.0001; Group I versus Group II

Table 2: Effect of yoga therapy on respiratory parameters

Parameters	Group I (before One year yoga)	Group II (After One year Yoga therapy)
VC	2.50+0.21	2.73+0.37**
FVC	2.44+0.36	2.81+0.22***
FEV1	2.18+0.41	2.40+0.30*
PEFR/m	337.69+83.1	395.08+75.4*
FEF50 L/S	3.72+0.38	4.24+0.47**

P <0.01; P <0.001; P <0.0001: Group I versus Group II

Discussions

Postmenopausal depressive problems and health complications is increasing in the modern world. Our study reports evidently documents the significant presence of various stress in the postmenopausal women. This has been well correlated with the hormonal imbalance (Westberg L 2008 ; Ostlund, H 2003) . Thus there is a need to search and develop a cost-effective, simple, community-based therapeutic tool to provide symptom relief and to improve health status, and in this perspective yoga has . emerged as the appropriate system to deal effectively with issues related to post menopause (Freeman EW 2014; Bromberger JT 2007) . The present results demonstrates the clinical utility of yoga in significantly reducing the stress improving the quality of life. The decreased level of estrogen and progesterone during menopause is also responsible for the declined muscular power, diminished efficiency of the bronchial muscle to undergo relaxation. Osteoporosis in menopause leads to more compression of thoracic spine. This

might be the cause for the declined pulmonary function test after menopause

The physiological and biochemical mechanisms that takes place during the practice of yogic exercises might be the potent cause for the benefits (Reed, S. D et al , 2014). The improvements caused by the yogic practice might be due to the several components such as strength the muscle, muscular strength and stamina and flexibility. The muscle stretching during yoga might be increase in the oxidative capacity of the skeletal muscle decreasing glycogen utilization. Further, continuous yoga practice might increase the calcium absorption from the intestine, stimulate bone remodeling. These factors might be well correlated with the improvement in the respiratory parameters observed in this study (Reed, S. D et al , 2014).

In the present study post-Menopausal stress was decreased by yoga therapy. Alterations in the neurotransmitters levels, changes in the blood flow to the brain might contribute to the increased brain metabolism (Streeter, C. C (2007) .Activation of the sympathetic nervous system might also be liable for this improvement through yoga practice. Group and individual practice helping the gradual improvement in the lifestyle choices having impact on enhancement of psychological well-being significantly contributing to health promotion. Though most of the clinical effects of yoga are probably brought about by vagal stimulation and parasympathetic activation, the complete mechanisms underlying the reported benefits remain poorly understood. Clearly, additional high-quality research is warranted to confirm and further explore the putative beneficial effects of yoga in post-menopausal women.

Conclusion

The study has been associated with the prevalence of stress among the post-menopausal women is a matter of great concern. Health complications are increasing after menopause in the recent years. Proper measures has to be taken to prevent future complications. In this study , the post-menopausal women who has been doing regular yoga showed a drastic improvement in the pulmonary functions with the decreased stress level. Practicing yoga might provide a source of deviation from the routine life helping women to focus on the easiness of movement reduce stress. Daily yogic exercises might also be responsible in causing the flexibility of the muscle increasing muscle endurance preventing respiratory complications. More motivational measures should be focused to encourage the postmenopausal women to join the yoga exercise classes which will further increase the socialization promoting mental health.

Future research

Based on this study the future research could be focused upon widespread community based studies by constant motivating and including large number of post-menopausal women. There is also a need to explore the neurohormonal receptor mechanisms that could be responsible in promoting these beneficial mechanisms during the continual practice of yogic exercises.

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