EFFECTIVENESS OF AEROBIC EXERCISE WITH SELF MYOFACIAL RELEASE TECHNIQUE ON HIP AND TRUNK FLEXIBILITY IN PERI-MENOPAUSAL WOMEN

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ABSTRACT: Background: Perimenopause is also called the stage during which the women make the natural transition to menopause. During this stage there will be series of symptoms, which also includes musculoskeletal symptom like reduced hip and trunk flexibility and Reduced range of motion therefore, the purpose of the study was to find out the effectiveness of aerobic exercise with self-myofascial release in perimenopausal women. The aim of the study was to determine the Effectiveness of Aerobic exercise with self-myofascial release (MFR) technique on hip and trunk flexibility in peri-menopausal women.

Methodology: An Quasi experimental design with preand post in nature, Fifteen subjects of Peri-menopause women were selected according to Menopause questionnaire as per the inclusion criteria and their hip and trunk flexibility was assessed as pretest with outcome measure of Modified sit and reach test and undergone the intervention of Aerobic Exercise with Self myofascial Release Technique (SMFR). The outcome measures were taken before the treatment and after the end of 4 weeks of treatment Result: According to the statistical analysis done by using paired ‘T’ test (p<0.0001), hence this study shows that there is a significant improvement in hip and trunk flexibility in of Peri-menopause women.

Conclusion: It is concluded that Aerobic exercise with self-myofascial release can increase the hip and trunk flexibility in peri-menopausal women.

Key words: Peri-menopausal women, Aerobic exercise, self-myofascial release Technique, Modified sit and reach test, Hip and trunk flexibility, Menopause questionnaire.
INTRODUCTION

MENOPAUSE is the period during which the menstrual cycle ceases, or the female sex hormones diminish to almost none is called menopause. Through a woman's reproductive about 400 of the primordial follicles grow into mature follicles and ovulate, and hundreds of thousands of ovadegenerate. At about 40 to 45 years of age, onlya few primordial follicles remain to be stimulated by FSH and LH, and the production of oestrogens by the ovaries decreases as the number of primordial follicles approaches to zero. Through a woman's reproductive, about 400 of the primordial follicles grow into mature follicles and ovulate, and hundreds of thousands of ovadegenerate. At about 40 to 45 years of age, only a few primordial follicles remain to be stimulated by FSH and LH, and the production of oestrogens by the ovaries decreases as the number of primordial follicles approaches to zero.

This process happens slowly and is divided into three stages: Stage 1 – perimenopause, Stage 2 – menopause, Stage 3 – post menopause.

PERIMENOPAUSE: According to the World Health Organization (WHO) “The term perimenopause should include the period immediately before the menopause (when the endocrinological, biological and clinical features of approaching menopause commence) and the first year after menopause”.

Perimenopause begins about eight to 10 years before menopause. It usually starts in the mid-40s, but it can start earlier. The hormonal changes you experience during perimenopause are mostly caused by declining oestrogen levels. Your ovaries make oestrogen, which plays a vital role in maintaining the reproductive system. Once enter perimenopause, the oestrogen levels start to decrease. As oestrogen decreases, it throws off the balance with progesterone, another hormone produced by the ovaries. These two hormones together are responsible for ovulation and menstruation. It’s common for hormone levels to fluctuate during perimenopause.

BODY MASS INDEX: Body mass index (BMI) is a value derived from the mass (weight) and height of a person. BMI is defined as the body mass divided by the square of the body height, and is expressed in units of kg/m², resulting from mass in kilograms and height in meters.

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BMI = \frac{\text{weight in kg}}{(\text{height in m})^2}
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- Underweight: BMI is less than 18.5
- Normal weight: BMI is 18.5 to 24.9
- Overweight: BMI is 25 to 29.9
- Obese: BMI is 30 or more
PREVALENCE:
The present study was carried out to determine the mean age of menopause and the prevalence of menopause and menopausal symptoms in South Indian women. At least 60% of ladies suffer from mild symptoms and 20% suffer severe symptoms and 20% from no symptoms.

In the United States, approximately 1.3 million women become menopausal each year. It typically begins between the ages of 51 and 52. However, about 5% of women experience early menopause between the ages of 40 and 45. Additionally, 1% of women experience premature menopause before the age of 40 due to permanent ovarian failure that maybe associated with sex chromosome abnormalities.

COMMON SYMPTOMS:

Hot flashes, Night sweats, Vaginal dryness, Mood swings, Panic disorder, Anxiety, Depression, Irritability, Unexplained dizziness, Fatigue, Insomnia, Weight gain, Stress incontinence, Osteoporosis, Headaches, and migraines, Breast pain, Joint pain, Gum problems, Digestive problems, Dry, itchy skin, Tingling extremity, Muscle tension, MUSCULOSKELETAL SYMPTOMS. Oestrogen reduces the collagen content of connective tissue, Stiffness of ligament and tendon. In women, these commonly affect the gluteal, hamstring, Achilles and rotator cuff tendon. Reduction in resting metabolic rate, Physical activity expenditure, Loss in muscle flexibility, Reduced range of motion, Reduced hip and trunk flexibility.
Physiological Changes During Menopause:

Menopause is an abnormal physiologic process in aging women in which the number of ovarian primary follicles quickly diminishes, such that there are inadequate amounts to respond to the effects of FSH. In turn, there is no LH surge, and ovulation does not take place, resulting in the decline of estrogen production and the cessation of menstruation. Flexibility: Flexibility may be defined as the property and ability of body tissues to achieve full range of motion (ROM) without any injury to the joints or within their groups. Range of motion is regulated by proper extensibility of all soft tissues encompassing the joints.

The basic role of flexibility is to reduce the risk of injury. Proper muscle elasticity increases the ability to move joints within their maximal possible range of motion. Exercise:

Aerobic Exercise:

Aerobic exercise is a physical exercise of low to high intensity that depends primarily on the aerobic energy-generating process. It improves muscle strength, endurance, and flexibility. Aerobic exercises improving hip and trunk flexibility are standing lunge hip rotation, standing sidestretch Cat and camel exercise.

Self-myofascial release technique:

Self-myofascial release is a tool-assisted, self-massage technique used to release muscle tension, improve flexibility, and boost movement efficiency. This technique utilizes the patient’s body mass and special tools such as foam rollers to apply pressure and stretch the restricted soft tissues. Foam rolling restores muscles, tendons, ligaments, fascia, and soft-tissue extensibility.

Foam Roller:

A foam roller is a lightweight foam cylinder that you use to self-administer deep tissue massage. Foam rolling releases muscle knots, relieves inflammation, and improves overall comfort.

Modified Sit and Reach Test:

The modified sit and reach test area modified version of the traditional sit and reach test. In this test, zero mark is adjusted according to each individual, based on their sitting reach level. Important functional measure of hip and trunk region flexibility including the hamstring muscles.

To determine the modified sit and reach test scores, the participant assumed a sitting position with the head, back, and hips against a wall (90° angle at hip joint) and the feet against the sit and reach box and was instructed to place hand over hand and reach out, level with the measurementscale. During this reach, the head, back, and hip remained in contact with the wall. The distance from the fingertip to the box edge was read off from the ruler placed centrally on the sit and reach box, this
indicated the starting point. Then flexed the trunk slowly and reached forward as far as possible, head and back having moved away from the wall with fingers sliding along the surface of the box. The final position was held for 2 seconds. The total distance reached was noted from the graduation on top of the box. The reach score or flexibility was the initial position subtracted from the final position in centimeters. Measurement was taken to the nearest 0.1 cm.

MATERIALS AND METHODOLOGY

This is a quasi-experimental study design with pre and post nature, has done at Cheran institute of health science, outpatient department - Coimbatore and the study population was Perimenopausal women among 40 to 55 years, the duration of the study has conducted was 6 months with the sample size was 15 with as Convenient sample method and undergone 4 weeks of treatment duration as per the inclusion and exclusion criteria and 1 meter scale, Sit and reach box, White paper, Pencil, Inch tape, Weight machine as material used.

INCLUSION CRITERIA

- Age: 40-55 years
- Perimenopausal women by Menopause questionnaire
- BMI = 18.5 to 24.9 (normal range)
- Hip and trunk flexibility.

EXCLUSION CRITERIA

- Age below 40 years and above 55 years
- Any hip surgeries
- Other than normal range BMI
- Chronic low back pain

PROCEDURE

Approval from the Institution of Ethical Committee was obtained for this study. The 15 subjects were selected in accordance with inclusion criteria. For all subjects in the experimental group, the treatment protocol of aerobic exercise and self-myofascial release were explained, and the consent form was obtained.
The pre-test was taken by using the modified sit and reach test. Then the treatment was explained to the patient and thought how to do. They were asked to do the exercise for 4 weeks in two sessions at the morning session Aerobic exercise and at the evening session Self-myofascial release for 5 days per week. After the 4th week the post test was assessed using Modified sit and reach test. AEROBIC EXERCISE a, standing lunge stretch b, lying hip rotation c, standing side stretch d, Cat and camel exercise, SELF MYOFASCIAL RELEASE Rolling of the Hamstring, Rolling of the Gastrocnemius, Rolling of the Gluteus Maximus, Rolling of the Quadriceps

**STATISTICAL ANALYSIS:** The improvement in the hip and trunk flexibility was calculated by using the pre-test and post-test taken before and after treatment. The data obtained is analysed using paired t-test.

**DATA ANALYSIS** Statistical analysis using patient’s parameters to calculate t value and the mean difference of modified sit and reach tests values were calculated in the experimental group.

The above table shows that out of 15 samples, pre-test and post-test mean, mean difference, standard deviation, and “t” value.

**THE PRE-TEST AND POST-TEST GRAPH FOR MODIFIED SIT AND REACH TEST**

**RESULT**

*OGWUMIKE O.O., 2AROWOJOLU A.O. AND 1 SANYA A.O* In this study, engagement of Nigerian peri menopausal and postmenopausal women in a twelve-week endurance exercise program led to a reduced relative disease risk in terms of a significant reduction in the waist-hip ratio (abdominal adiposity) of the participants. Also, a significant improvement in flexibility resulted in better health-related component of physical fitness of the participants. Based on the result of this study it is recommended that Nigerian women in the perimenopausal and postmenopausal age group should engage regularly in endurance exercise programs. This study also showed that there was a significant increase in the hip and trunk flexibility in the perimenopausal women. The pre-test mean obtained is 22.87 and the post-test mean is 25.07. By using the paired ‘t’ test the t value is 12.717 with p value <0.0001
DISCUSSION

Women in the perimenopausal age group face a number of changes in the body system which may lead to loss of health-related fitness. The loss of ovarian function induces a reduction in resting metabolic rate, physical activity energy expenditure, fat free mass and an increase in fat mass and abdominal adipose tissue accumulation. At perimenopause due to age related changes, substantial loss in tendon flexibility may occur. This may lead to reduced range of motion, soreness and stiffness at the joint. Self-myofascial release is a form of stretching and is often accomplished by use of a foam roller. Self-myofascial release uses an individual’s body weight by incorporating a foam roller to massage restrictions that are in the soft tissue. Correct muscle imbalances, Joint range of motion, Muscle soreness & relieve joint stress, Neuromuscular hyper tonicity, Extensibility of musculotendinous junction, Neuromuscular efficiency and maintain normal functional muscular length. **Aerobic** exercise is a physical exercise of low to high intensity that depends primarily on the aerobic energy – generating process. It improves muscle strength, endurance and flexibility. The result of this study by giving aerobic exercise and self-myofascial release showed that, The pre-test mean obtained is 22.87 and the post-test mean is 25.07. By using the paired ‘t’ test the t value is 12.717 with p value <0.0001.

CONCLUSION

In this study, the 15 perimenopausal women according to the inclusion criteria was selected and assessed for hip and trunk flexibility using modified sit and reach test. And was given aerobic exercise and self-myofascial release for weeks.

By the statistical analysis (t=12.717) there was a significant increase in the hip and trunk flexibility in perimenopausal women of giving Aerobic exercise and Self-myofascial release.

Hence it is concluded that the alternate hypothesis was accepted.

LIMITATIONS AND RECOMMENDATIONS

LIMITATION OF THE STUDY:

- The treatment duration of the study is only 4 weeks.
- The study was limited with the specific age group of 40 to 55 years.
- The study was limited for obese women.
- Only the perimenopausal women were selected.
- Only one time the observation is done for this study.
- To make the patient understand the study.

RECOMMENDATIONS:

Similar studies can be done using long duration.

- The study can be done for postmenopausal women and menopausal women.
- The study can be done with different tool.
- Further studies can be conducted by comparing any manual therapy and electrotherapymodalities.
Acknowledgment

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Declarations

Conflicts of interest: Nil

Funding sources: Self

Ethical clearance: Verbal consent and written consent were taken from each subject who participated in the study and Ethical clearance from our Institutional Ethical committee (IEC)

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