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ORIGINAL ARTICLE

Effects of Aerobic Exercises on Postmenopausal Depression: Randomized Controlled Trial

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ABSTRACT

Menopause, is a stage in female life where there is a permanent stoppage of female menstrual cycle because of gonadal steroidal loss and oocyte depletion. A perimenopause state is characterized by gradual oocytes loss, widespread hormonal fluctuations and irregular menses cycle.

Aim: To determine the effects of aerobic exercises on post-menopausal women.

Study design: Randomized controlled trial.

Methodology: Study was completed during the time duration of six months. Simple convenient sampling technique was used among all females aged between 40-65 years. HDS was used for depression scoring. Normality of data was assessed by Kolmogorov test and the significance level showed that the data was normally distributed. Data was evaluated by using SPSS version 24. Descriptive statistical analysis was applied for the demographical data. Finally, the results for both control and interventional groups were computed via paired sample t-test and independent t-test respectively.

Results: In this study, p=0.000 for MRS and P=0.000 for HDS in experimental group depicted that aerobic exercises are highly significant for treatment of depression if combined with the anti-depressant drugs therapy.

Practical Implication: This study highlighted that use of aerobic exercises in combination with the drug therapy explored this mode of the treatment of the depression and other related symptoms among the post-menopausal women.

Conclusion: It was concluded that the patients improve earlier if they were provided with the aerobic exercises along with the anti-depressant medications.

Key words: Depression, Menopause Rating Scale, Postmenopausal and Hamilton rating scale for depression.

INTRODUCTION

Menopause, is a stage in female life where there is a permanent stoppage of female menstrual cycle because of gonadal steroidal loss and oocyte depletion. A perimenopause state, also called a transition state is heralded which is characterized by gradual oocytes loss, widespread hormonal fluctuations, reformed gonadal steroidal feedback sensitivity and irregular menses cycle[1]. A women, in its menopausal state go through social, psychological and physical changes[2].

Along with changes in menstrual bleeding pattern, women also complaint of having other symptoms, commonly among them are poor sleep, hot flashes, mood swings, hormonal changes, vaginal dryness and mainly depression[3]. Depression is a serious medical as well as psychological issue. It is actually a disorder which in turn causes a number of emotional as well as physical ailments in the individual suffering from it[4]. Symptoms of depression may vary among different individuals. It is not like being alone but it is actually lost of happiness in all the aspects and activities of life which were once enjoyed.[5] It is thought that somewhere between 10%-15% of women experience depression in any form either psychological or situational in their postmenstrual duration of life[6]. Researchers studying menopausal status and depression symptoms association concluded conflicting results.

Researches from recent years concluded that there is significant associations between menopausal states and depression state as menopausal state increases, depression level also increases but on other hand, some researchers have a difference of opinion stated that the depressive symptoms in menopausal state is just because of other contributing factors like life stress, decline in their physical health and other sociodemographic factors[7]. Exercise training, for instance aerobic exercises, are considered a useful and positive intervention to get rid of an individual's suffering and pain. It not only encourage a person's physical fitness but also found quiet effective in improving their mental situation[8]. Studies in the past showed a remarkable decrease in depression and anxiety in depressive patients just after one single session of these aerobic exercises[8,9]. Anti-depressant drugs is the most common medical treatment given to depressive menopausal women. However, some patients develop drug resistance or show results for small period of time following with more severe depressive[10]. Accordingly, it seems to be important to find out a safe and conservative method for alleviating the post-menopausal depression[11].

Recently, resistance exercise training has been recommended by several clinical guidelines as a complement to aerobic exercise (combined training) as an effective non pharmacological treatment tool in cardiovascular and metabolic diseases[12]. The basic aim of the investigation was to patrol the effects of aerobic exercises on post-menopausal women with depression treated by anti-depressive drugs. Aerobic exercises will effective to improve mood swings and quality of life in gynecology patients now a days[11]. According to a study, increased physical activity is considered a beneficial therapy for treatment of depression. The aim of the elected study was to investigate the effects of aerobic exercises particularly Pilates training on post-menopausal women with depression treated by anti-depressive drugs[13].

A randomized control trial was conducted to findout elaborate the effect of exercise in the postmenopausal women for improvement of their physical fitness as well as quality of life. It was concluded after data analysis that the fitness level and quality of life could be improved via regular physical activities and exercises. However, the effect in the postmenopausal women was seen after 15 weeks of treatment[14]. Also another imperative study was conducted on the postmenopausal women which indicated that the postmenopausal women mostly suffer from the depression and this is because of the lack of the hormones. The severity of exercise didn't matter but the regularity does because it was found that even a low or moderate level of exercise scheduled regularly can not only help in gaining perfect body weight but it also lowers

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the psychological symptoms of postmenopausal women like stress, mood swings, anxiety, low mood, and depression[15].

However, the use of aerobic exercises in combination with the drug therapy is a novice approach that lacks researches and it was the dire need of the time to explore this mode of the treatment of the depression and other related symptoms among the post-menopausal women.

The researches already conducted were mostly about effects of aerobic exercises on vitals (temperature, heart rate, pulse, blood pressure and oxygen saturation) of postmenopausal women. The purpose of recent study was to evaluate if given with the anti-depressant drugs, particularly for improvement in mood of post-menopausal women, suffering with the depression. However, the use of aerobic exercises in combination with the drug therapy is a novice approach that lacks researches and it was the dire need of the time to explore this mode of the treatment of the depression and other related symptoms among the post-menopausal women.

The objective of the study was to determine the effects of aerobic exercises on post-menopausal women.

METHODOLOGY

It was a randomized controlled trial that was conducted at New Life Hospital, Tezab Ahatta Lahore. The study was completed during the time duration of six months after the approval of the synopsis. Simple convenient sampling technique was used to collect the data in which all females aged between 40-65 years, having HDS/MRS scoring of 0-4(none, mild, moderate and severe) and having normal BMI were included in the study. All females having any other musculoskeletal, joint problems, spinal cord injuries, paralysis and any other systemic disease were excluded from the study. Females with no symptoms of all items of MRS (menopause rating scale) also fall into exclusion criteria. Later on the data was divided into two study group i.e. Group A and B. Participants in group A were treated by aerobic exercises and anti-depressive drugs (SSRI & SNRI) as per physician's advice. The aerobic exercise were provided in the form of treadmill exercise and static cycling for 8 weeks with three sessions per week, and each session consisted of about 50 minutes with 10 minutes warming up exercises, 30 minutes walking on treadmill and static cycling and last 10 minutes for cooling down. Participants in group B were treated by anti-depressive drugs (SSRI & SNRI) only as per the directions of the physician. 20 participants from group A and 20 participants fall into group B by using online epitool software[15]. Mean and variance selected for group A and B were 18, 2.1 and 16.8 and 2.06 respectively. Confidence level of 0.9 was used to get a total sample size of 40 (20 in group A and 20 in group B)[16]. Data was then collected by using 2 data collecting scales i.e. MRS (Menopause Rating Scale) and HDS (Hamilton Depression Scale). HDS was used for depression scoring as scores between 10-13 showed mild depression, 14-17 showed moderate severity whereas more than 17 represented severe depression. The validity of this scale as per Cronbach's Alpha coefficient [17] is 0.76 and reliability as per r value is 0.94 whereas P<0.001, which make it a valid, reliable as well as a significant scale for depression measurement.[18] MRS, on the other hand was used to assess the quality of life of females. It has 11 items in total and each item is scored via 4 points as per Likert scale[19] of 4 points with minimum value as 0 and maximum value as 44. The validity of this tool as per Cronbach's Alpha coefficient is 0.77. The reliability of this tool was r = 0.86 and P = 0.000 depicting that it was highly reliable and significant tool for measurement of health related quality of life among females.[18] To gain their cooperation and trust, the basic aim of the treatment procedure and aim of the study were explained to each participated individual prior to first session. Each participant was also asked to sign an informed consent form prior participating in the investigation. In the experimental group females, 40 minutes of exercise training program thrice per week, consisted of warming up for 5 minutes, treadmill walking for 30 minutes and then cooling down for 5 minutes .The iliopsoas, quadriceps, calf muscles, tibialis anterior and gluteus maximus were stretched for five minutes in a three-to-five repeat pattern before the actual aerobic training session and the stretch was held for 20-30 seconds. Normality of data was assessed by Kolmogorov test and the significance level showed that the data was normally distributed.

Statistical analysis: Data was evaluated by using SPSS version 24. Descriptive statistical analysis was applied for the demographical data. Finally, the results for both control and interventional groups were computed via paired sample t-test and independent t-test respectively. Quantitative variables like age were presented as frequency and percentages. Comparison of two groups, Control and interventional was done after application of the normality tests. P-value of less than 0.05 was taken as significant.

RESULTS

Table-1 showed the age of the participants and it has been found that the maximum participants were between age group 40 years old to 47 & 56 to 66 years old, while the minimum participants were from the age group 48 to 56 years old. Similarly, total mrs value which has been concluded by calculating the difference between control and experimental group after treatment. The value showed that the treatment was effective as not even a single participant suffered from severe depression and even moderate depression was seen in only 20% of the participants. It can be concluded from this result that both the treatments were effective as per the MRS (table-1).

Table-1: Socio-Demographic Variables

Study Group		N	%age
Age of Participants (Years)	40-47	14	35
	48-56	12	30
	57-65	14	35
MRS computed	No depression	16	40
	Mild depression	16	40
	Moderate depression	8	20
Socio Economic Status	Upper middle class	4	20
	Lower middle class	9	45
	Lower class	7	35

The P=0.000 for MRS in control group and P=0.001 for HDS in control group depicted high significance of the anti-depressant drugs therapy for treatment of depression. The p=0.000 for MRS and P=0.000 for HDS in experimental group depicted that aerobic exercises are highly significant for treatment of depression if combined with the anti-depressant drugs therapy (table-2).

The significance value of p=0.955 represented non-significant results for control group according to MRS as P>0.05 while P=0.019 represented high significance for experimental group according to MRS as P<0.05. Similarly, the significance value P= 0.751 represented non-significant results for control group according to HDS as P>0.05 while P=0.000 represented high significance for experimental group according to HDS as P<0.05 (table-3).

Table-2: Paired samples T-test

Variable	**Mean**	**Standard deviation**	**T value**	**DF**	**Significance**
MRS (Pre-post Control)	1.00	0.725	6.164	19	0.000*
MRS (Pre-post Experimental)	0.55	0.604	4.067	119	0.001*
HDS (Pre-post Control)	1.40	0.680	9.200	19	0.000*
HDS (Pre-post Experimental)	0.900	0.788	5.107	19	0.000*

*Statistically significant

Table-3: Independent sample t-test variables

Variables	Mean difference	T-value	DF	Significance
MRS (Control)	0.1666	0.380	11	0.955
MRS (Experimental)	0.4047	0.943	11	0.019*
HDS (Control)	0.4285	1.271	11	0.751
HDS (Experimental)	0.5000	1.951	11	0.000*

*Statistically significant

DISCUSSION

One study revealed that among postmenopausal women, depression was the most common issue which in turn led to many other issues like sleep disturbance and mood swings. It was also concluded from this study that all these issues can be managed by the physical activities[20]. Recent study results also supported the hypothesis that aerobic exercise is the best form of physical activity for postmenopausal women. Thus, physical activity is the key to alleviate the psychological symptoms after menopause. Another study explored the effects of regularly performed aerobic exercises in postmenopausal women who had sedentary lifestyle. The results proved that the women with sedentary lifestyle who perform the aerobic exercises on daily basis have great improvement in both the physical as well as the psychological health and thus the health care practitioners must recommend postmenopausal women to perform the exercises particularly aerobics on daily basis in order to improve their health conditions which differs from recent study as more population was a of lower middle class[21].

One literature review revealed that the physical activity not only help in improvement of cognitive functions but it also helped in improvement of the symptoms of breast cancer[22]. These results favored the results of recent study that physical activity is important for improvement of cognitive functions among postmenopausal women but at the same time, there is a difference of breast cancer population, as breast cancer is also a cause of depression among postmenopausal women. However, the results favored the physical activity to improve the symptoms originating from any of the breast cancer or menopause.

Another study held in 2020 explored the benefits of aerobic exercises for improving cognitive symptoms and sleep quality in menopausal women. The results suggested that aerobic exercises have significant benefits in improving these symptoms. The study concluded that aerobic exercises not only help in alleviating these symptoms but these exercises also help to improve the cognitive functions among postmenopausal women[23]. Recent study results specifically point the benefits of aerobic exercises for improvement of psychological symptoms and cognitive functions among postmenopausal women. Our results were in line with results of studies conducted in 2019 who observed that regular exercise activity was an exceptionally useful strategy to work on both the psychological and physical wellness in post-menopausal ladies[24,25]. Similarly, a survey elaborated the effects of aerobic exercises, specifically the step training and the music therapy on mental health in the postmenopausal women. The study suggested that both the aerobic exercises as well as the music therapy had a soothing and relaxing effect and help in reduction of depression among postmenopausal women[26]. Recent study also suggested the improvement in depression symptoms via the aerobics but the component of music therapy was missing in this study. However, merely, aerobics can also have a significant improvement in symptoms of depression among postmenopausal women. Similar study explored the outcomes of long-term aerobic exercises for physical fitness and other symptoms in women during post-menopausal duration. It was an interventional study with RCT design and MRS was used to measure the outcomes. The P<0.1of research study depicted that 12-24 weeks aerobic exercises had a positive impact on the women's fitness parameters and also help to reduce the health issues which is also quiet similar to recent study[27]. One researcher conducted a study regarding the effects of four weeks aerobic training for treatment of depression in post-menopausal women. The P<0.05 depicted that aerobic exercises help to reduce depression and improve self-esteem and muscular as well as physical health which was quiet similar to recent study[28].

CONCLUSION

It was concluded that the patients improve earlier if they were provided with the aerobic exercises along with the anti-depressant medications. This research was particularly related to the progression of the health related QOL (quality of life) among the females in their era of post-menopausal depression and it has been found that aerobic exercises have best therapeutic impact to help the patients to come out of the depression phase. Aerobic exercises include a number of exercises but this study included only basic aerobics like static cycling and walking on a treadmill and these are proved very significant for improvement of the condition of the patients.

Limitations: Sample size was very small and financial limitations followed by low man power for follow-ups.

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