

Case Report

Effects of Aerobic Exercise in an Older Adult with Chronic Major Depressive Disorder Who Untreated with Pharmacotherapy

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Major Depressive Disorder (MDD) is a common and serious mental illness associated with a high comorbidity, a significantly reduced physical health, and quality of life. So, treatments on MDD are needed to improve quality of life and physical health including gait, balance and muscle strength, in addition to continuing efforts to promote psychological well-being. Aerobic Exercises (AE) are one of the treatment options in MDD. AE as a treatment intervention for MDD provides comparable benefits, rates of response and remission rates to antidepressants. As a result dramatic improvements were seen in both physical and cognitive functions in a patient with MDD. In this study, the short and long-term effects of AE in a 76 years older adult with chronic MDD who untreated with pharmacotherapy were examined. The case was discussed with the recent literature.

Keywords: Elderly; Major depressive disorder; Exercise**Abbreviations**

MDD: Major Depressive Disorder; AE: Aerobic Exercises; YGDS: Yesavage Geriatric Depression Scale; MMSE: Mini Mental State Examination; FES: Fall Efficacy Scale; WHOQOL-OLD: World Health Organization Quality of Life Assessment for Older Adults; TUG: Timed Up and Go test; TBGT: Tinetti Balance and Gait Test; PASE: Physical Activity Scale for Elderly

Case Report

Major Depressive Disorder (MDD) is common disorder and associated with poor outcomes among older adults. Also, this disorder represents a combination of disturbances in mood, anxiety, cognition, sleep, and appetite that last for more than 2 weeks [1]. Pharmacological, non-pharmacological and psychological treatments are suggested to treat these symptoms [2]. Physical exercises play an important role in non-pharmacological treatment approaches. Physical exercise is such a therapy with great interest in patients with MDD [2,3]. A number of studies have shown that AE and resistance training may reduce self-reported depressive symptoms in nonclinical populations and in patients diagnosed with MDD [3,4]. Here, we report an older adult with chronic MDD who treated with exercise therapy and followed-up three months. A 76 years old female patient admitted to our outpatient clinic with depressive symptoms of sadness, anhedonia, insignificance, reluctance to getting out of house, memory complaints, and weight loss. Her depressive complaints had been started in 2006 after her daughter died unexpectedly. Before this time, she had no history of depression. After three months, she had applied to a psychiatrist and “anti depressant medication” had been started for MDD. Subsequently, olanzapine had been added to reinforce the treatment. On admission, her depressive symptoms were present and she referred to Gulhane Training and Research

Hospital, Division of Geriatrics outpatient clinic in February 2016. She was evaluated by a geriatrician and diagnosed as chronic MDD.

On examination, she was a febrile, her blood pressure and heart rate were 130/80 mmHg and 68 beats/min, respectively. Her physical examination was unremarkable otherwise. Her laboratory findings including hemoglobin, glucose, urea and creatinine, liver and thyroid function tests, magnesium, calcium, sodium, potassium, vitamin B-12, folate, ferritin, and vitamin D were within reference range. Her present medications were anti depressant medication 50 mg twice daily, “a typical antipsychotic medication” 2.5 mg daily, and calcium 1500 mg plus vitamin D 880 IU daily. She followed-up with this treatment protocol for 6 months but no positive effects were seen in her depressive symptoms. Therefore, anti depressant and typical antipsychotic medication were stopped. In the meantime, the case was consulted by a physiotherapist for improving her physical activity level.

This case were assessed with the following scales and evaluations to determine the her physical and mental status; Yesavage Geriatric Depression Scale (YGDS), Mini Mental State Examination (MMSE), knee extensor muscle strength with hand-held dynamometer, hand grip strength with Jamar hand dynamometer, Fall Efficacy Scale (FES), World Health Organization Quality of Life Assessment for Older Adults (WHOQOL-OLD), Timed up and go test (TUG), Tinetti Balance and Gait Test (TBGT) and Physical activity scale for elderly (PASE), respectively. The case was evaluated at baseline, 1 and 3 months post-treatment.

After medical evaluation, she was enrolled in a special exercise program. This program included 10 minutes warm-up, 20-25 minutes flexibility, balance and strengthening exercise, and 10 minutes cool-down exercise periods [5]. Warm-up consisted of jogging, breathing, upper and lower extremity active exercises. The flexibility,

Table 1: Effects of exercise on mood, physical and cognitive function.

	Baseline	1 month follow-up	3 months follow-up
YGDS (0-15)	10	5	3
MMSE score (0-30)	28	28	29
Knee extensor muscle strength (kg)	7.5	7.5	8.2
Hang grip strength(kg)	4.6	4.6	4.8
FES (10-100)	55	54	50
WHOQOL-OLD	76	76	92
TUG (second)	9.81	9.51	8.42
TBGT score (0-28)	22	25	28
PASE (0-361)	46.27	50.21	62.15

YGDS: Yesavage Geriatric Depression Scale; MMSE: Mini Mental State Examination; FES: Falls Efficacy Scale; TUG: Timed Up and Go Test; TBGT: Tinetti Balance and Gait Test; PASE: Physical Activity Scale for Elderly.

Higher scores of YGDS show greater depressive mood.

Higher scores of MMSE show better cognitive performance.

Higher scores of knee and hand strength show better muscle strength.

Higher scores of FES indicate that increasing in fear of falling.

Higher scores of WHOQOL-OLD show better quality of life.

Higher scores of TUG show reduction in dynamic balance and gait performance.

Higher scores of TBGT indicate that reduction in risk of falls.

Higher scores of PASE show improving physical activity level.

strengthening and balance exercise sections included shoulder rolls, shoulder stretch, neck stretch, seated lifts, seated quadriceps stretch, ankle roll, shallow knee bends, toe rises, push-pulls, side stepping first to the right, then left, then backwards and finally in circles. Also, the cool-down period contained walking with slow speed, breathing and stretching exercises. At the same time, all of the exercises were explained to patient and her relatives for home program. In the home program, patients performed exercise three times each week. This program was continued for 4 weeks.

In the post treatment evaluation, a dramatic improvement in depressive symptoms and physical status were observed. Only, minor depressive symptoms were present over 3 months of follow-up. The patient is now more active and happy and has ability to take care of grandchild.

Exercise therapy showed positive improvements in all evaluation parameters out of MMSE and muscle strengths, at 1 month. Furthermore, all assessments for physical and mental status were improved in the control visit after 3 months. The effects of exercises on YGDS, MMSE, knee extensor muscle and hand grip strengths, FES, WHOQOL-OLD, TUG, TBGT and PASE were shown in (Table 1).

Discussion

To the best of our knowledge, this is the first report that shows the effects of exercise on mood, physical and cognitive function in an older adult with chronic MDD who untreated with pharmacotherapy. We observed the improvement in physical condition and decreasing in depressive symptoms in this case after exercise therapy.

Latest guidelines have showed that exercise is an effective intervention for MDD compared with other treatments [6]. Therefore, we applied similar exercises to the patient advised by latest guidelines. The exercise therapy achieved promising results in this case in terms

of improving mood, physical and cognitive status both acutely and chronically.

Bartholomew, et al. [7] showed that acute exercise could improve the mood of depressed individuals in addition to yielding cognitive improvement. Cognitive function was improved immediately after physical exercise in young and elderly healthy subjects [8,9]. This effect appeared to occur only when AE was applied [8]. In this study, depressive mood of patient was improved in post treatment and follow-up period, gradually.

In a study made by Kerling, et al. the exercise therapy was applied to 25 individuals with MDD. They found the improvement in their aerobic capacity comparing with the control group [10]. Also, Busch, et al. found that exercise therapy might have helpful effect on the fear of falling and quality of life. In the same study they compared the participants in terms of exercise habits [11].

Exercise therapy was advised to individuals with MDD to increase their muscle strength, quality of life, and to decrease fear of falling [6,12]. In a recent meta-analysis made by Knapen, et al. exercise therapy was revealed to improve physical health, body image, and patient's coping strategies with stress, quality of life, and independence in activities of daily living in older adults with MDD [13].

In this case, medication was discontinued and exercise therapy started. Although many different treatment techniques have been reported for MDD, exercise therapy is considered an approach that should not be overlooked [10,14,15]. In this regard, the clinical practice of exercise therapy and the long-term benefits of exercise should be further explored.

Conclusion

The results of this study show that exercise therapy may be beneficial in the treatment of an elderly with MDD who untreated with pharmacotherapy. We advise short-term and long-term exercise programs to treat older adults with MDD.

References

- Whiteford HA, Degenhardt L, Rehm J, Baxter AJ, Ferrari AJ, Erskine HE, et al. Global burden of disease attributable to mental and substance use disorders: findings from the Global Burden of Disease Study 2010. *Lancet*. 2013; 382: 1575-1586.
- Brosse AL, Sheets ES, Lett HS, Blumenthal JA. Exercise and the treatment of clinical depression in adults: recent findings and future directions. *Sports Med*. 2002; 32: 741-760.
- Dunn AL, Trivedi MH, Kempert JB, Clark CG, Chambless HO, et al. Exercise treatment for depression: efficacy and dose response. *Am J Prev Med*. 2005; 28: 1-8.
- DiLorenzo TM, Bargman EP, Stucky-Ropp R, Brassington GS, Frensch PA, LaFontaine T. Long-term effects of aerobic exercise on psychological outcomes. *Prev Med*. 1999; 28: 75-85.
- Williams CL, Tappen RM. Exercise training for depressed older adults with Alzheimer's disease. *Aging Ment Health*. 2008; 12: 72-80.
- Kvam S, Kleppe CL, Nordhus IH, Hovland A. Exercise as a treatment for depression: A meta-analysis. *J Affect Disord*. 2016; 15: 67-86.
- Bartholomew JB, Morrison D, Ciccolo JT. Effects of acute exercise on mood and well-being in patients with major depressive disorder. *Med Sci Sports Exerc*. 2005; 37: 2032-2037.

8. Carta MG, Aguglia E, Caraci F, Dell'Osso L, Di Sciascio G, Drago F, et al. Quality of life and urban/rural living; preliminary results of a community survey in Italy. *Clin Pract Epidemiol Ment Health*. 2012; 8: 169-174.
9. Gasquet I, Negre-Pages L, Fourrier A, Nachbaur G, El-Hasnaoui A, Kovess V, et al. Psychotropic drug use and mental psychiatric disorders in France; results of the general population ESEMeD/MHEDEA 2000 epidemiological study. *Encephale*. 2005; 31: 195-206.
10. Kerling A, Von Bohlen A, Kuck M, Tegtbur U, Grams L, Haufe S, et al. Exercise therapy improves aerobic capacity of inpatients with major depressive disorder. *Brain Behav*. 2016; 22; 6: 00469.
11. Busch AM, Ciccolo JT, Puspitasari AJ, Nosrat S, Whitworth JW, Stults-Kolehmainen M. Preferences for exercise as a treatment for depression. *Ment Health Phys Act*. 2016; 10: 68-72.
12. Schuch FB, Vancampfort D, Richards J, Rosenbaum S, Ward PB, Stubbs B. Exercise as a treatment for depression: A meta-analysis adjusting for publication bias. *J Psychiatr Res*. 2016; 77: 42-51.
13. Knapen J, Vancampfort D, Morien Y, Marchal Y. Exercise therapy improves both mental and physical health in patients with major depression. *Disabil Rehabil*. 2015; 37: 1490-1495.
14. Deslandes AC, Moraes H, Ferreira C, Veiga H, Silveira H, Mouta R, et al. Exercise and mental health: many reasons to move. *Neuropsychobiology*. 2009; 59: 191-198.
15. Deslandes AC, Moraes H, Alves H, Pompeu FAMS, Silveira H, Mouta R, et al. Effect of aerobic training on EEG alpha asymmetry and depressive symptoms in the elderly: a 1-year follow-up study. *Braz J Med Biol Res*. 2010; 43: 585-592.