



SHORT COMMUNICATION

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The effect of 10 weeks hydrotherapy on quality of life and coordination function in the women with multiple sclerosis

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Abstract

Multiple sclerosis (MS) is a chronic demyelinating neurological disease. Several studies have reported that complementary and alternative therapies can have positive effects against pain in these patients. The objective was to investigate the effectiveness of a hydrotherapy program against pain and other symptoms in MS patients. In this randomized controlled trial, 30 women MS patients were randomly assigned to an experimental or control group for a 10-week treatment program. The experimental group (15 patients) underwent 30 sessions of hydrotherapy program in swimming pool and the control group did any exercise training in this time. The experimental group showed a significant ($P < 0.05$) and clinically relevant decrease in pain intensity versus baseline, Significant improvement were also observed in quality of life, coordination function, EDSS, mental health, and psychological health. According to these findings, hydrotherapy program improves quality of life and coordination function in the patients with multiple sclerosis.

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References

Multiple sclerosis (MS) is a chronic debilitating disease of the central nervous system (CNS). It is characterized by the two simultaneous processes, inflammation leading to demyelination and degeneration of neuronal axons, resulting in the disruption of axon potentials in the brain and spinal cord (Compston and Coles, 2008). Depending on the area of the CNS affected MS can cause a multitude of motor, sensory, visual, psychological, sexual, and bladder and bowel symptoms. People with Multiple Sclerosis (MS) may experience difficulties with balance and mobility, fatigue, muscle weakness, spasticity, impaired sensation, altered vision, cognitive difficulties and incontinence. More women than men are affected by MS. The global female: male ratio is estimated at 3:1 (Dua *et al.*, 2008). Recent evidence (Ramagopalan *et al.*, 2010) suggests that the female: male ratio is increasing due to an increase in the numbers of female RR patients over time. One of the most commonly reported symptoms in MS is loss of balance (Bakshi, 2003, Peterson *et al.*, 2007a). Balance problems along with other symptoms of MS challenge a person's physical mobility and their ability to ambulate safely in their community or at home, therefore, increase their risk of falling (Cattaneo *et al.*, 2002). Recent literature has highlighted the high prevalence of falls in MS (Finlayson and Peterson, 2006, Peterson *et al.*, 2007a). The cost of a fall to an individual with MS and to health services across the globe is significant. Consequences of a fall for that individual can include injuries, hip fractures being one of the most common, decreased confidence and increased fear of falling and a decrease in activity levels and social participation. Physiotherapy plays an important role in the management of symptoms in MS but the specific outcome of these treatments on MS with moderate to severe mobility impairment has not been evaluated to date. Exercise has been shown to be a beneficial treatment option for MS with minimal gait impairment. Interventions in the form of regular cardiovascular and strengthening exercise programs have

demonstrated significant improvements for MS (Rietberg *et al.*, 2004, Motl and Gosney, 2008). Improvements have been observed in disease symptoms, general fitness and QoL. A recent review has been published highlighting the effect of exercise therapy in improving fatigue in MS with minimal gait impairment (Andreassen *et al.*, 2011). The effectiveness of exercise as an intervention for people with more severe mobility impairment is not known as this research is focused mainly on MS who are more mobile (EDSS<6). Very little is known about how this specific population of MS with moderate to severe mobility impairment respond to exercise interventions. This research aims to add to the evidence base available surrounding this population of MS.

Material and methods

Statistical population consists of 30 MS patients whose MS has been confirmed by a neurologist. (Those suffering from the multiple sclerosis of CNS white matter in the brain, spinal cord and myelin sheath (COMPSTON, A. 2004) and all of them are treated with medication and have medical records in one of the accredited private medical centers. Clinically speaking those who have the following symptoms suffer from MS Multiple Sclerosis: A) Have a history of heart disease. B) Have positive neurological examination confirming Multiple Sclerosis C) their MRI contains signs of demyelinated plaques at various times and places and have positive laboratory evidence in favor of multiple sclerosis (NACI, H., 2010) From among the population. Of 30 persons were selected randomly as research sample and were divided into two groups based on inclusion criteria. Experimental group consisted of 15 and the control group consisted of 15 people. One day before starting the exercise program the patients involved in the study came together in the desired location and were briefed on how to do the exercise -the number of repetitions in each session and then the experimental and control groups participated in the pretest and at this stage, physical disability scale test developed was measured by a specialist neurologist and recorded and the quality of life was measured at this stage

using a questionnaire (SF-36). So coordination function was measured by Stork Stand test. Training program for the experimental group was implemented in form of hydrotherapy for 10 weeks and 3 sessions a week. After finishing the 10 weeks, the tests were done again (post-test).

Results

The experimental group showed a significant ($P < 0.05$) and clinically relevant decrease in pain intensity versus baseline, Significant improvement

were also observed in quality of life, coordination function , EDSS, mental health, and psychological health. Tables below show these significant different.

Discussion and Conclusion

Exercise can be useful for physical health, functional status, emotions and quality of life of MS patients (DUA, T,2008). Mottel *et al* concluded that worsening of symptoms by exercise has rarely been associated with MS patients.

Table 1. Statistical indices of coordination function in the experimental and control groups.

p	t	control		Experimental		variable
		Post-test	Pre-test	Post-test	Pre-test	
0.023 *	3.45	32.65 ± 16.76	28.78 ± 17.65	66.34 ± 61.42	20.75 ± 15.98	coordination function

Table 2. Statistical indices of EDSS in the experimental and control groups.

F	Control		Experimental		Variable
	Post-test	Pre-test	Post-test	Pre-test	
* 19.63	3.5 ± 0.6	3.4 ± 0.3	3.1 ± 0.2	3.8 ± 0.8	EDSS

Meanwhile hydrotherapy is of remarkable significance as exercise in water increases physical fitness. Since patients' weights considerably reduce in water and the circumferential water resistance brings about balance in the patient and also as one of the most essential problems of these patients during exercise is increased body temperature which disturbs neural messages and increases disability. Water prevents increase of body temperature. It also brings about increased maintenance and strength of muscles, brain oxygen supply, promotion and maintenance of range of motion, development of muscle control, reduction of muscle rigidity, increased quality of life and wellbeing, promotion and development of balance and amplified vitality (FINLAYSON, M,2006). Obviously any program to be effective must be based on patients' needs. Exercise programs are valuable once they can fulfill the needs of MS patients. Taking into consideration the nature and the relapse period of this disease, MS is associated with severe muscle spasms and cramps,

if the exercise programs are not appropriate they may result in intensification of MS symptoms (ROUDSARI, B,2005). Therefore, doing laborious physical exercise is not recommended because intense exercise can increase body temperature and worsen the symptoms. Intense fatigue can contribute to aggravating factors of the disease (COMPSTON, A. & COLES, A. 2008). In view of the said points, various therapeutic exercises are recommended: "aerobic exercise, yoga and swimming" to alleviate fatigue; improve the quality of life, increase walking speed and endurance and to enable the patients to overcome the disease and increase the level of balance and to control it." McKollag *et al* studied the effect of aerobic exercise on quality of life and depression in MS patients with mild disability.

Coordination function impairment is a common and debilitating symptom for MS and was another most commonly reported problem for the participants in this study. It has been shown to be a risk

factor for falls and may lead to a decrease in physical activity. Experimental group was effective in improving balance.

According to these findings, hydrotherapy program improves quality of life and coordination function in the patients with multiple sclerosis.

References

- Andreasen A.K, Stenager S, Dalgas U.** 2011. The effect of exercise therapy on fatigue in multiple sclerosis. *Multiple Sclerosis*. **17**, 1041 -1054.
- Armstrong LE, Winat DM, Swasey PR seidle ME, Carter Al, Gehlsen G.** 1983. Using isokinetic dynamometry to test Ambulatory patients With multiple sclerosis. *phys ther*. **63**, 1274-78.
- Bakshi R.** 2003. Fatigue associated with multiple sclerosis diagnosis, impact & management. *Multiple Sclerosis*. **9**, 219-227.
- Benito-Leon J, Morales J, Rivera-Navarro, J, Mitchell A.** 2003. A review about the impact of multiple sclerosis on health related quality of life. *Disability Rehabilitation*. **25**, 1221-1303.
- Cattaneo D, De Nuzzo C, Fascia T, Macalli M, Pisoni I, Cardini, R.** 2002. Risks of falls in subjects with multiple sclerosis. *Archives of Physical Medicine and Rehabilitation*. **83**, 864-867.
- Compston A, Coles, A.** 2008. Multiple sclerosis. *Lancet*. **372**, 1502-1517
- Finlayson M.** 2004. Concerns about the future among older adults with MS. *American Journal of Occupational Therapy*. **58**, 54-63.
- Finlayson M, Peterson, E.** 2006. Risk factors for falls among people aged 45 to 90 years with Multiple Sclerosis. *Archive of Physical and Medical Rehabilitation*. **87**, 1274- 1279.
- Masudy R, Mohamadi Y, Nabavi SM, Ahmadi F.** 2008. The effect of Orem based self-care program on physical quality of life in multiple sclerosis patient .shahrekord university of medical sciences. **10(2)**, 2-9.
- Peterson E, Cho C, Von Koch L, Finlaysson M.** 2007. Injurious fall among middle aged and older adults with MS. *Archive of Physical and Medical Rehabilitatio*. **89**, 1031-1037.
- Ramagopalan SV, Byrnes JK, Orton SM, Dymont DA, Guimond C, Yee IM, Ebers GC, Sadovnick AD.** 2010. Sex ratio of multiple sclerosis and clinical phenotype. *European Journal Of Neurology: The Official Journal Of The European Federation Of Neurological Societies*. **17**, 634 – 637.
- Roudsari B, Ebel B, Corso P, Molinari N, Koepsell T.** 2005. The acute medical care costs of fall-related injuries among the U.S. older adults Injury, *Int J Care Injured*. **20**, 73-84.
- Soltani M, Hejazi SM, Noorian A, Zendedel A, Ashkanifar M.** 2009. The Effect of Aerobic Training on the Improvement of Expanded Disability Status Scale (EDSS) in Multiple Sclerosis Patients. *medical scirnces Journal of islamic azad university of mashhad*. **5 (1)**, 15-20.
- Soltani M, Hejazi SM, Noorian A, Zendedel A, Ashkanifar M.** 2009. The Effect of Selected Aerobic Exercise on the Balance Improvement in Multiple Sclerosis Patients. *J Mashhad School Nurs Midw*. **9(2)**, 107-113.
- Woods DA.** 1992. Aquatic exercise programs for patient with multiple sclerosis. *Clin kinesiol* .**45**, 14-20.