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Research Article

Hydrotherapy Effect on Cytokine Responses in Multiple Sclerosis Diseases

Zohre Afsharmand[1], Vahid Imanipour[2], Fatemeh Mahdi[2], Mehdi Sadeghi [3], Alireza Naderi[4], Sokhangooi Yahya[5*], Behboodi Laleh[1]

[1]Faculty of physical education, Islamshahr Branch, Islamic Azad University, Islamshar, Iran
[2]Department of physical education, Parand Branch, Islamic Azad University, New City of Parandr, Iran
[3]Fars Science & Research Branch, Islamic Azad University, Fars, Iran
[4]Faculty of physical education and sport sciences, Borujerd Branch, Islamic Azad University, Borujerd, Iran
[5]Department of Physiotherapy, University of Social Welfare and Rehabilitation Sciences, Tehran, Iran

Corresponding author
Sokhangooi Yahya
Email: vhim918@gmail.com

Abstract: Multiple Sclerosis is a chronic and progressive autoimmune disease of central nervous system that affects the brain and spinal cord and marked with destruction of myelin sheath of nerve cells and formation of scars causing disorder in the flow direction of action potentials. The main cause of this disease is unknown. At present the disease has reached ages of less than 20 years with an escalating trend among women being twice more prevalent in woman than in men. The present study aims to explore the effect of 10 weeks hydrotherapy on EDSS and Interleukin 10 (IL10) in female MS patients. The statistical population consists of 30 MS patients whose MS has been confirmed by a neurologist. They divided into two groups based on inclusion criteria. Experimental group consisted of 15 and the control group consisted of 15 people with ages ranging from 22 to 51 and the weight of 58.9 ± 9.3 kg, height of 153.5 ± 15.6 cm. According to the descriptive statistics EDSS decreased in the experimental group after 10 weeks hydrotherapy. But no significant different was seen in IL10 in two groups. Lack of physical activity tends to increase muscle weakness and fatigue. In the other hand, regular physical training, especially in water, can benefit people with MS.
Keywords: Multiple sclerosis, Hydrotherapy, IL10, EDSS, women

INRODUCTION

Multiple Sclerosis (MS) is a chronic and progressive autoimmune disorder of central nervous system that affects the brain and spinal cord. It is marked with the destruction of myelin sheath of nerve cells and formation of scars that causes disorder in the flow direction of action potentials. The main cause of MS is unknown. The symptoms of MS appear between the ages of 20 to 40. At present it has reached ages of less than 20 years with an escalating trend among women being, twice more prevalent in woman than in men. The prevalence of MS is different in terms of geographical location. It increases from the equator towards the hemispheres. Since there is no definitive cure for MS, patients must rely on some treatments that only reduce the symptoms of the disease.

Taraghi *et al*. reported that the mean age of onset of this disease has been 27.12 +/- 8.03 [1]. Through the world, about 3.5 million people suffer from this disease. For many years MS patients had been advised against participating in physical exercise as because some patients had reported instability of symptoms during the exercise due increase in body temperature. In addition avoiding exercise saves energy that results in reduced fatigue sparing energy for daily life activities. But in the last decade, role of exercise had been confirmed because of its beneficial effects in MS patients. It is proved that the intensification of the number and severity of sensory symptoms that occurs following exercise in more than 40% of patients are temporary and in half an hour after exercise, they will return to normalcy in 85% of patients [2]. Also control of the symptoms during physical activity program can increase participation in exercise programs [3]. The benefits of regular aerobic exercise in MS patients include elevated mood (mental state), increased capacity, and the ability to perform daily life tasks [4]. Moreover stretching exercises and yoga are recommended for the MS patients [5]. Exercise therapy can be used as a complementary treatment alongside drug treatment to reduce signs of disease [6]. Contribution to the advancement of science and researches in the field of physical education it is emerging as a complementary treatment (addition to drug treatment) to enhance the physical health and the quality of life of MS patients in fighting MS and to tackle the variable nature of this disease and to control its side effects such as tremor and unsteadiness, muscle cramps, dizziness and defects, as well as modulation the immune system to stop destruction of the myelin and central nervous system white matter before it damages the axons of nerve [1]. The positive effect of physical activity on MS patients has attracted he attention of the researcher's to perform certain aerobic exercises in the water (hydrotherapy) for signs of disease and enhances patients' health besides medications. The researcher

expects to reach significant benefit on patients after selected aerobic exercises in water [1].

MATERIALS AND METHODS

The present study aims to explore the effect of 10 weeks hydrotherapy on EDSS and Interleukin 10 (IL10) in female MS patients. The type of research is applied research, and the methodology is semi-experimental, which due to the limitations, the research plan included testing the experimental and control groups before and after the tests the results of which were analyzed. The statistical population consists of 30 MS patients whose MS has been confirmed by a neurologist. They divided into two groups based on inclusion criteria. Experimental group consisted of 15 and the control group consisted of 15 people with ages ranging from 22 to 51 and the weight of 58.9 ± 9.3 kg, height of 153.5 ± 15.6 cm. Patients had no Cardiovascular disease history- final diagnosis of MS confirmed by a neurologist, no history of epilepsy, no history of metabolic diseases, not pregnant, no history of regular exercise during the past three months. All participants had physical disability scale (EDSS) between 1-5. One day before starting the hydrotherapy program the patients involved in the study came together in the desired location and were briefed on how to do the exercise – the intensity of 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 by a specialist neurologist, and gave blood sample for analyzing IL10.Hydrotherapy program for the experimental group was implemented for 10 weeks, 3 sessions per week. After completing the training the program both groups were given tests and the results were analyzed.

RESULTS

The main purpose of this research was the effect of 10 weeks hydrotherapy on IL10 and EDSS in MS patient. This study found that ten weeks of hydrotherapy had a significant impact on the EDSS among M.S patients. According to the descriptive statistics, presented in table 1, EDSS decreased in the experimental group after 10 weeks hydrotherapy. But no significant different was seen in IL10 in two groups (table2).

Table 1: 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

Table 2: Statistical indices of IL10 in the experimental and control groups

Control		Experimental		Variable
Post-test	**Pre-test**	**Post-test**	**Pre-test**	
34± 14.33	33±15.65	36±14.32	37±16.26	IL-10

DISCUSSION

Physicians has classified MS symptoms in 3 groups [7]:

- Primary symptoms: directly caused by demyelination of certain nerves “visual disturbances”.
- Secondary symptoms: caused by primary symptoms like an early form of paralysis can bring about the secondary problem of muscle atrophy that results in inactivity.
- Tertiary symptoms: are mental, psychological and social complications that are caused by primary and secondary symptoms.

As definite treatment is lacking, exercise can be useful for MS Patients for improving physical health, emotions, functional status and quality of life [8] and there is rare worsening of symptoms in MS patients by exercise [9].

Hydrotherapy is of remarkable significance as exercise in water increases physical fitness. Patients’ weights are considerably reduced in water. Circumferential water resistance brings about balance in the patient and also prevents increase of body temperature. It also brings about increased maintenance and strength of muscles, oxygen supply to brain, promotion and maintenance of range of motion, reduction of muscle rigidity, development of muscle control, promotion and development of balance, increased quality of life and wellbeing and amplified vitality [10]. 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. But if the exercise programs are not appropriate it may result in intensification of MS symptoms [11]. Therefore, laborious physical exercise is not recommended as it can increase body temperature

and worsen the MS symptoms and intense fatigue can contribute to aggravating factors of the disease [8].

In view of the said points, various therapeutic exercises are recommended: "Hydrotherapy, 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 [1].

The results of IL10 show that IL10 as immune-endocrine parameters is not one mediator of beneficial training effects specially in MS patients.

CONCLUSION

Lack of physical activity tends to increase muscle weakness and fatigue. In the other hand, regular physical training, especially in water, can benefit people with MS.

REFERENCES

1. Nornematolahi S, Soltani M, Hejazi SM, Salmanimoghaddam S, Ashkanifar M; The effect of aquatic aerobic training on quality of work life in multiple sclerosis (MS) patients. European Journal of Experimental Biology, 2013; 3(4): 7-12.
2. Taraghi Z , Ilali EAS, Mahmoud A, Zarvani A, Nama KE, Mohammadpour Tahamtan R A *et al.*; Quality Of Life Among Multiple Sclerosis Patients. Iran Journal of Nursing, 2007; 20(50): 59-51.
3. Dalgas U, Stenager E, Ingemann-Hansen T; Multiple sclerosis and physical exercise: Recommendations for the application of resistance – endurance and combined training. Mult Sclera., 2008; 14(1): 35-53.
4. Mottle RW, Snook EM; Physical activity, self-efficacy, and quality of life in multiple sclerosis. Mult Scler., 2008; 35(1): 140-142 .
5. White LJ, McCoy SC, Castellano V, Gutierrez G, Stevens JE, Walter GA *et al.*; Resistance training improves strength and functional capacity in person with multiple sclerosis. Mult Scler., 2004; 10(6): 668-674.
6. Soltani M, Hejazi SM, Noorian A, Zendedel A, Ashkanifar M; Comparing the effect of 8 week aquatic aerobic training on the rate of balance on high & low degree M.S patients. J Mashhad School Nurs Midw., 2009; 9:107-113.
7. Armstrong LE, Winant DM, Swasey PR, Seidle ME, Carter AL, Gehlsen G; Using isokinetic dynamometry to test ambulatory patients with multiple sclerosis. Phys Ther., 1983; 63(8):1274-1279.
8. Soltani M, Hejazi SM, Norian A, Zendedel A, Ashkanifar M; Comparing the effect of 8 week aquatic aerobic training on the rate of balance on high & low degree M.S patients, 6th International Congress on Physical Education and sport Sciences, 2008: 4-6.
9. Motl RW, Arnett PA, Smith MM, Barwick FH, Ahlstrom B, Stover EJ; Worsening of symptoms is associated with lower physical activity levels in individuals with multiple sclerosis. Mult Scler., 2008; 14: 140–142.
10. Wiles CM, Newcombe RG, Fuller KJ, Shaw S, Furnival-Doran J, Pickersgill TP; Controlled Randomized Crossover trail of the effects of physiotherapy on mobility in chronic multiple sclerosis. Journal of Neurology, Neurosurgery & psychiatry, 2001; 70(2): 174-179.
11. Woods DA; Aquatic exercise programs for patients with multiple sclerosis. Clinical. Kinesiology, 1992; 46(3): 14–20.