CASE STUDY

5 YEAR PHYSIOTHERAPY AND REHABILITATION RESULTS OF THE PATIENT WITH MILLER FISHER SYNDROME

[1]Bihter AKINOĞLU
[2]Kadriye ARMUTLU

ABSTRACT

Background: Miller-Fisher syndrome (MFS) is characterized by gait ataxia, external ophtalmoplegia and areflexia and thought as an uncommon variant of Guillain Barre syndrome. Miller-Fisher syndrome is observed in about 5-8% of all Guillain Barre syndrome (GBS) cases. In MFS patients, spontaneous improvement was observed in the first 3 months and these improvements were started by the 2nd week.

Method: This case was referred to physiotherapy and rehabilitation program at the 4th week since the appropriate medical treatments were unsuccessful after the attack. The patient was evaluated generally before physiotherapy program, and muscle length, strength loss, deep tendon reflexes, postural impairments and daily difficult activities and positions were assessed. Besides, the desired daily activities were identified by The Canadian Occupational Performance Measure (COPM). Treatment program was adjusted according to the patient and changes during treatment period were observed. Physiotherapy program included classical physiotherapy methods: posture correction, correction of short muscles, muscle strengthening, flexibility increase, balance/coordination, sitting and standing functions and walking improvement and climbing up stairs.

Results: After the treatment, lower extremity muscle shortness decreased and muscle strength, standing on one foot duration, independent walk speed increased in time. Before treatment, he could not climbing upstairs, but it was achieved 1 year after the treatment. Berg balance score increased in time and his most desired activities by COPM (10/10) were could be performed after the treatment.

Conclusion: The case improved with physiotherapy and rehabilitation program gradually with years.In the treatment of MFS patients, physiotherapy and rehabilitation being part of the treatment will be useful.

Keywords: Miller-Fisher syndrome (MFS), muscle strength, therapy, syndrome, rehabilitation, GBS

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CORRESPONDING AUTHOR

[1]Bihter AKINOĞLU

Yıldırım Beyazıt University, Ankara,
Faculty of HealthSciences,
Department of Physiotherapy and
Rehabilitation, Turkey.

[2]Hacettepe University,
Faculty of HealthSciences,
Department of Physiotherapy and
Rehabilitation, Turkey.

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INTRODUCTION

Miller-Fisher syndrome is (MFS) an acute clinical picture with ataxia, external ophthalmoplegia and areflexia and a rare variant of Gullian Barre syndrome (GBS). GBS incidence is two times more common in men than women in the community studies. It is most common in 4-5th decades. MFS consists approximately %5-8 of all GBS cases [1-2]. Firstly MFS was identified in 1932 by Collier as a GBS variant [3-4]. In 1956, a Canadian scientist Charles Miller Fisher published 3 cases since they had this triad and it was reported as a GBS variant with good outcome [4]. MFS is seen in all ages, more common in 50-70 years [5]. Some features of MFS differ from GBS and some features were similar. MFS was observed with external ophthalmoplegia and brain stem encephalitis. Axonal type MFS (acute motor axonal neuropathy) was observed with ataxia. According to patient history, there were previous infection and affection and weakness in cranial or arm and legs. MFS is characterized with ophthalmoplegia, cerebellar type ataxia and areflexia without muscle weakness [6]. MFS patients have generally well recovery period without any sequels. %71 of the cases have viral infection history starting 10-15 days before the symptoms. The initial clinical signs: diplopia %38, ataxia %20 and areflexia %81. Cranial nerve involvement includes: oculomotor nerve %56, facial nerve %45, vagus-glossopharyngeus %39, hipoglossus %13 [6-8].

Case

5 years ago, one morning a 66 years old male patient had admitted to neurology clinic with complaints of imperception of his extremities, lack of control of his movements and his position, unclear vision and drunk walk with the help of two people. He had not experienced lower or upper respiratory infection one month before the disease. He had diabetus mellitus in his history. He had diagnosed with MFS. In neurology clinic, he had optimal medical treatments, but no improvement was observed. Therefore he had referred to physiotherapy and rehabilitation program 4 weeks after the attack. The patient had undergone physiotherapy program for 3 days/week.

Evaluation

The patient was evaluated generally before physiotherapy program, and muscle length, strength loss, deep tendon reflexes, postural impairments and daily difficult activities and positions were assessed. Besides, the desired daily activities were identified by The Canadian Occupational Performance Measure (COPM). 3 activities were evaluated with 10- points scale in term of significance, importance, satisfaction.

General evaluation results: in lower extremities short muscles (++), areflexia (-), lower extremity muscle strength 2/5, upper extremity muscle strength 3/5, standing independent with open eyes (-), standing on one foot with open eyes (-), independent walk (-), climbing up stairs independently (-). The 3 most desired activities by COPM; driving 10/10, independent shaving 9/10 and climbing up stairs 8/10.

Physiotherapy Program;

Treatment program was adjusted according to the patient and changes during treatment period were observed. The patient was evaluated before physiotherapy program, and re-evaluated in the 1, 2, 3, 4 and 5th year of the program. The evaluation and treatment were administrated by the same therapist.

Physiotherapy program included classical physiotherapy methods: posture correction, correction of short muscles, muscle strengthening, flexibility increase, balance/coordination, sitting and standing functions and walking improvement and climbing up stairs and soft tissue mobilization in soles, mobilization in small and big joints in foot complexes, cervical mobilization stimulating type I proprioceptors in neck, balance education in hard and rough surfaces, weight use in walk education, posture exercise in front of the mirror, aligning of body parts in a straight line on mirror, balance education in front of the mirror, linear movements of vestibular system on a ball, up-down movements stimulating otolit organ, sensation integrity education [9]. Besides, the most desired 3 activities by COPM were considered to be associated with visual disorder; and home exercises and activities were prescribed to increase hand-eye coordination and eye-contact: cutting black shapes in the white paper, aligning beads with different colors and widths in the rope, jigsaw puzzle, completing points and drawing picture, replacing rods on a wood platform.

RESULTS

After the treatment, lower extremity muscle shortness decreased in time. Before the treatment, lower extremity muscle strength was 2, after treatment in first 2 years increased to 3 and in 4th years to 4. However, in the 5th year, lower extremity muscle strength decreased from 4 to 3. Before treatment, upper extremity muscle strength was 3, and increased to 5 in time after the treatment. Standing on one foot duration increased in time, and it decreased slightly in the 5th year. Failure of independent walk speed before treatment was achieved in the end of the 1styear, and increased in 2 and 3rd years, and decreased after 4 years slowly. Before treatment, he could not climbing upstairs, but it was achieved 1 year after the treatment, and his speed increased in the 3rd year. However, his speed decreased slightly by the 4th year. His Berg balance score was 18 before the treatment, and increased gradually, and it was 49 in the end of the 5th year (Table 1). Driving a car, his most desired activity by COPM (10/10) was restricted to the site 1 year after the treatment, he could drive to the city center 2 years after, could drive to the other cities 3 years after the treatment. Independent shaving (9/10) and climbing up stair (8/10) activities could be performed 1 year after the treatment. He could still perform all 3 activities 5 years after the treatment. Besides, 1 year after the treatment, his visual acuity returned back to the times before the attack.

DISCUSSION

Guillain-Barre syndrome is an acute inflammatory disease of the cranial and spinal never roots. Its most prominent feature is the symmetrical muscle weakness beginning from distal to proximal. Miller-Fisher syndrome is a variant of GBS, its classical triad is ophthalmoplegia, areflexia and ataxia [10]. Generally there is a systemic infection before the clinical picture. Prodromal upper respiratory infection is more common than gastrointestinal system infection. However our case did not have any infection history. Ataxia is one of the initial symptoms, it has peripheral and central mechanisms[11]. In our patient, the most prominent and problematic symptom was the ataxia. Deep tendon areflexia is one of the component of the classical MFS triad, but contrary to general belief, areflexia does not occur always[11]. Hence, our patient did not have areflexia.

Before treatment serious lower extremity shortness decreased in time but did not reach the normal level. Before the treatment, lower extremity muscle strength was 2, after treatment in first 2 years increased to 3 and in 4th years to 4. However, in the end of the 5th year, lower extremity muscle strength decreased from 4 to 3. Before treatment, upper extremity muscle strength was 3, and increased to 5 in time 5 years after the treatment. Decrease of muscle shortness and increase of muscle strength usually occur at the end of the 1st year. It is considered that this is associated with physiotherapy program as well as improvement potential. Duration of standing on one foot increases in time, and decreased slightly at the end of the 5th year. It is considered that this is associated with physiotherapy program as well as improvement process, and maybe with increased age. Failure of independent walk speed before treatment was achieved in the end of the 1st year, and increased in 2nd and 3rd years, and decreased by the 3rd year. Before treatment, he could not climbing upstairs independently, but it was achieved 1 year after the treatment, and his speed increased in the 2nd year. However, his speed decreased slightly by the 3rd year. It is considered that this is associated with physiotherapy program as well as improvement process, and maybe with increased age. His Berg balance score was 18 before the treatment, and increased gradually, and it was 49 in the end of the 5th year. This suggest that the effect of physiotherapy program maintains continuously, even though there may be decreases in muscle strength, the person can be active in his daily life, and may have a well balance. Driving a car, his most desired activity by COPM (10/10) was restricted to the site 1 year after the treatment, he could drive to the city center 2 years after, could drive to the other cities 3 years after the treatment. Independent shaving (9/10) and climbing up stair (8/10) activities could be performed 1 year after the treatment. He could still perform all 3 activities 5 years after the treatment. It is considered that this is associated with physiotherapy program as well as improvement process.

According to the literature, we generally find studies with medical treatments for MFS [12-14]. In these studies we did not find studies on physiotherapy and rehabilitation program for MFS. However, it was reported in a study that 6-years old male case had undergone mechanic ventilation, nazogastric enteral feeding, and physiotherapy and optimal medical treatments were administrated during the intensive care supportive treatment. Then the patients was oriented, his eyes were opened spontaneously, he followed the commands with a motor response, however had flask paralysis in lower extremities. 20 days after the discharge from intensive care, his tracheostomy was closed without any problems. The neurological examination was as follows: upper extremity muscle strength 4/5, lower extremity thigh flexion 3/5, dorsal flexion 1/5, plantar flexion 1/5, he had no sense deficit. The patient with this signs could sit, but could not walk independently, and he was discharged with neurological sequels [15].

In MFS patients, spontaneous improvement was observed in the first 3 months. In a study evaluating median time from the disease development to the improvement, 28 MFS patients without any treatments experienced the first neurological sign in the 12th day for ataxia, 15th days for ophthalmoplegia [16]. MFS is a self-restricted benign syndrome. However, our patient was hospitalized for the first 3 weeks, and since he had no improvement 4 weeks after the attack, he had been referred to physiotherapy and rehabilitation program. We suggest that his age when the treatment started and his previous muscle strength might affect recovery period. Therefore, we adjusted the rehabilitation program as a geriatric rehabilitation program for balance and coordination and sense-perception education and postural adaptations.

In conclusion, we suggest that physiotherapy and rehabilitation applications are the important parts of the multidisciplinary and interdisciplinary approaches for the treatments of ophthalmoplegia, areflexia and ataxia in MFS patients and they will be useful for the cases. In addition, since this syndrome occurs mostly in 50-70 years old people, we suggest that geriatric rehabilitation applications should be included in the neurological rehabilitation protocols when the treatment is planned.

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Table 1. The patient values before and after treatment

		Before Treatment	AT 1 year	AT 2 year	AT 3 year	AT 4 year	AT 5 year
Lower extremity muscle shortness		++	+	+	+	+	+
Lower extremity muscle strength		2/5	3/5	3/5	4/5	4/5	3/5
Upper extremity muscle strength		3/5	4/5	4/5	5/5	5/5	5/5
standing on one foot (sec)	left	0	10	15	17	17	15
	right	0	10	17	20	18	16
Walk speed (sec)		-	14.50	13.10	12.04	13.48	14.12
Climbing up and down staris test speed (sec)		-	27.7	26.5	27.8	28.4	31.4
Berg balance scale score		18	30	36	42	45	49

AT: After Treatment, Sec : second (s)

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