



Fatigue Syndrome in Multiple Sclerosis

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Authors' contributions

This study was carried out in collaboration between all authors. Author FH designed the study. Author MDF managed the literature searches. Author AM analyzed the study. All authors read and approved the final manuscript.

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ABSTRACT

Background: Multiple sclerosis (ms) is a chronic and often debilitating disease that mostly affects young people who constitute the active part of community. The incidence of the disease has increased in recent years. Fatigue is one of the common complaints in patients with ms, which may aggravate their disability. However, early diagnosis and treatment have significant impact on their life quality. This study aimed to determine the prevalence of fatigue syndrome in patients with ms and the relationship between frequency of fatigue and depression in ms patients.

Materials and Methods: This descriptive study was carried out on 97 patients suffered from ms. A questionnaire including age, sex, marital status, duration of ms, the disease symptoms and signs were used. For assessing fatigue, iowa fatigue scale (ifs) was applied and for depression assessment, beck depression inventory (bdi) was used. Finally, the obtained data were analyzed using SPSS software.

Results: The study showed a high prevalence of fatigue (66%), which was mostly moderate. The relationship between fatigue and other variables, mainly marital status (p value=0.008), depression (p value<0.001), pyramidal signs (p value=0.039), cerebellar signs (p value=0.007), sensory

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symptoms (p value <0.001), and visual symptoms (p value $=0.017$) was statistically significant.
Conclusion: Fatigue is a common complaint in multiple sclerosis. Although, fatigue is a heterogeneous syndrome with various causes, the possibility of its prediction is high in MS patients through clinical evaluation.

Keywords: Fatigue; depression; multiple sclerosis.

1. INTRODUCTION

Multiple sclerosis is a chronic and often debilitating disease. In MS, the immune system attacks the myelin sheath of neurons in the central nervous system [1,2]. Moreover, myelin in form of small or large and single plates or multiple one is inflamed and destroyed. Depending on the location of the plaques in the central nervous system, the disease symptoms and signs will be different [3]. The most frequent age groups afflicted with MS ranged from 20 to 40 years old. The cause of MS remains unknown, but several factors including environmental factors, genetic background, and family background are considered as important in its occurrence [4,5]. Three major psychiatric symptoms are seen in MS patients include fatigue, psychiatric symptoms and cognitive deficits [6]. More than 80% patients complain about excessive fatigue, which leads to disability and quality life reduction. Both physical and mental fatigues interfere with daily activities such as work [7]. Little information about the mechanisms and pathophysiology of fatigue is available and researchers are attempting to discover its cause [8-10]. Fatigue in MS patients intensifies in the afternoon. Fatigue is also one of MS symptoms, but this, as symptoms of depression, is usually in the morning [6]. Depression is also one of the most common complications in MS patients. The rate of depression in patients with MS is about 20- 50% in the course of their disease and the point prevalence rate is usually about 10-20% [11,12].

This study attempted to investigate the prevalence of fatigue syndrome in patients with MS and the relationship between frequency of Fatigue and Depression in MS patients referred to MS Society of Yazd province of Iran because of high prevalence of fatigue syndrome in young patients suffered from MS.

2. MATERIALS AND METHODS

This was a descriptive study. The study population consisted of patients with multiple

sclerosis registered in MS society of Yazd province of Iran. 97 patients were enrolled the study which were selected randomly. A questionnaire including age, sex, marital status, duration of MS, the disease symptoms and signs were used.

To evaluate the different degree of fatigue, IOWA Fatigue Scale (IFS) was used and to assess the rate of depression, Beck Depression Inventory (BDI) was applied. It is noteworthy that patients had enough mental ability to fill out the questionnaire. IFS include 11 questions and each question has 1 to 5 points that represents the mildest to the most severe degrees of fatigue. For scoring, the scores of questions 2, 4, 7, 10, and 11 were subtracted from the score of question 6; and the obtained score was summed with scores of other questions. Scores rated between 11-29 reflects lack of fatigue, 30-39 represents moderate fatigue, and score 40 or more indicates severe fatigue.

$$\text{Score IFS} = Q1 + (6-Q2) + Q3 + (6-Q4) + Q5 + Q6 + (6-Q7) + Q8 + Q9 + (6-Q10) + (6-Q11)$$

Beck questionnaire has 21 questions and each question has 4 points (0-3) that represents the mildest to the most severe rate of depression. Summing up the points, the severity of depression is determined. The score ranged between 0-13 represents lack of depression, 14-19 mild depression, 20-28 moderate depression and 29-63 indicates severe depression.

2.1 Statistical Analysis

The data were analyzed by SPSS software (version 17) through tests of chi square, ANOVA, and fisher exact tests.

The data were analysed by SPSS software (version 17) through of Chi-Square and Fisher Exact Test to evaluate the relationship between fatigue and age, gender, marital status, depression, pyramidal signs, cerebellar signs, sensory, disease duration, and visual symptoms. To compare mean of fatigue with other variable were used the ANOVA test.

3. RESULTS

This descriptive study was carried out on 97 patients suffered from MS. These patients were referred to the MS Society of Yazd. The age of the patients ranged from 18-52 years old with mean age of 34.5±8.5. The study population included 15 men (15.5%) and 82 female (84.5%). Patients were divided in two age groups of 18-34 {53 patients (54.5%)} and 35-52 years {44 patients (45.5%)}. 21 (22%) were single and 76 (78%) were married. Based on IFS, out of 97 patients, 33 patients (34%) had no fatigue, 40 patients (41%) had moderate fatigue and 24 patients (25%) had severe fatigue. According to Beck questionnaire, the following results were obtained: 30 (31%) with no sign of depression, 25 (25.7%) with mild depression and 22 (22.7%) with moderate depression and 20 (20.6%) with severe depression. The findings of this study showed that a high percentage of these patients (66%) suffered from some degree of fatigue, which was mostly moderate. The relationship between fatigue and other variables, mainly marital status, depression, pyramidal signs, cerebellar signs, sensory and visual symptoms were statistically significant. Table 1 show that 65.9% of patients with MS suffered from some degree of fatigue. There is no statistically significant relationship between age classification and mean of fatigue in patients with multiple sclerosis (Table 2). The fatigue status in patients with MS in the age groups of 18-34 and 35-52 had no difference (P value=0.386). According to acquired data, state of fatigue in patients with MS had no relation with sex (P value=0.664). Fatigue in the married patients with MS was more than fatigue in single patients (P value=0.008)

(Table 3). Fatigue in the married MS patients had no significant relation to the level of education (P value=0.964). The degree of fatigue in patients with MS was unrelated to duration of their disease (P value=0.075). Being fatigue in patients with MS had significant and direct relationship with depression (Table 4). Fatigue had direct relation with pyramidal symptoms (P value= 0.039). Fatigue in the married patients suffered from MS correlated with cerebellar symptoms (P value= 0.039). Fatigue had direct relation with sensory symptom. Fatigue and sphincter symptoms were unrelated (P value=0.548). The relationship between frequency of fatigue and disease duration in MS patients was summarized in Table 5. There is no significant relationship between frequency of Fatigue and Disease duration (P value=0.075). Degree of fatigue in patients with MS intensified due to visual symptom (P value= 0.017).

Table 1. The frequency of fatigue in MS patients

Degree of fatigue	Number	%
Normal	33	34
Moderate	40	41.5
severe	24	24.5
Total	97	100

Table 2. The relationship between age and mean of fatigue in MS patients

Fatigue	Mean	SD
Age group		
18-34	31.62	9.16
35-52	35.02	9.22
Total	33.16	9.29

P Value= 0.073

Table 3. The relationship between frequency of fatigue and marital status in MS patients

Fatigue	None		Moderate		Severe		Total	
	Number	%	Number	%	Number	%	Number	%
Single	13	61.9	6	28.6	2	9.5	21	100
Married	20	26.3	34	44.7	22	58.9	76	100
Total	33	34	40	41.2	24.5	24.7	97	100

P Value= 0.008

Table 4. The relationship between frequency of Fatigue and Depression in MS patients

Fatigue	None		Moderate		Severe		Total	
	Number	%	Number	%	Number	%	Number	%
Normal	21	70	9	30	0	0	30	100
Low	7	28	14	56	4	16	25	100
Moderate	5	22.7	11	50	6	27.3	22	100
Severe	0	0	6	30	14	70	20	100
Total	33	34	40	41.2	24	24.7	97	100

P Value= 0.001

Table 5. The relationship between frequency of fatigue and duration disease in MS patients

Fatigue Duration disease	None		Moderate		Severe		Total	
	Number	%	Number	%	Number	%	Number	%
0.1-3.99	21	44	19	38	9	18	50	100
4-20	11	23.4	21	44.7	15	31.9	47	100
Total	33	34	40	41.2	24	24.7	97	100

P Value= 0.075

4. DISCUSSION

This study included 97 patients with multiple sclerosis who referred to the MS Society in Yazd province of Iran, with an average age of 34.5±5.8 years old. This average age was compatible with other previous studies [13]. The study population included 15 men (15.5%) and 82 female (5/84%). Patients were divided in two age groups of 18-34 years {53 patients (5.54%)} and 35-52 years {44 patients (45.5%)}. 21 (22%) were single and 76 (78%) were married. Based on IFS, 33 patients (34%) were normal, 40 patients (41%) had moderate fatigue and 24 patients (25%) had severe fatigue. In one study on MS patients in Guilan province of Iran, 60.5% of patients had fatigue in which was lower than other reported studies. This difference could be due to differences in fatigue scale [13].

Negin Hadi and et al studied the comparison of prevalence of fatigue in adult diabetic mellitus patients (n=400) with healthy population (n=400) in Shiraz (Neighboring province of Yazd) in 2010. In control group (n=400), 94 (23.5%) persons had fatigue and 23 (5.75%) had sever fatigue (Total=29.25%). So based on our study, prevalence of fatigue in patient s with MS (66%) is significantly higher than healthy population [14].

According to Beck questionnaire, the following results were obtained: 30 patients (31%) with no depression, 25 patients (25.7%) with mild depression, 22 patients (22.7%) with moderate depression and 20 patients (20.6%) with severe depression. The data showed that 69.9% of patients had sign of depression which was similar to Dehghani et al. [15] study. Dehghani study showed that a high percentage of patients (66%) suffered from some degree of fatigue, which was mostly moderate. The relationship between fatigue and other variables, mainly marital status, depression, pyramidal signs, cerebellar signs, symptoms and visual symptoms was statistically significant. In another study by Mohr et al. [16] in Denmark, the effect of treating depression on fatigue in MS patients was explored and showed that there was a

relationship between depression and fatigue. These findings were also consistent with our study. In 2008, Schwarts et al. [17] showed a significant relation between depression and fatigue which is consistent with our study. However in this study, there was significant relationship between fatigue and depression, but 10 patients with fatigue had no rate of depression. This finding supports the hypothesis that fatigue is a separate issue from depression [6]. In a study by Flachenecker et al. [18], the relationship between fatigue in MS patients and clinical parameters was explored. They reported that fatigue had relation with physical disability and depression but had no relation with age, duration of disease which is consistent with the findings of this study. In another study by Iriarte et al. [19], the relation between degree of fatigue in MS patients and clinical and biological factors was investigated. The following results were concluded: the relationship between fatigue and pyramidal symptoms which is consistent with this study. Mills and Yonge in [20] had conducted a study to find out the relationship between fatigue and other MS clinical symptoms. The results showed that the prevalence of fatigue in patients with MS was 60% and fatigue intensified with inability and had relationship with depression and anxiety. Moreover, no association between fatigue and duration of the disease and patient's age was found which is in line with our study. [20]. In a study by Eghbali et al in 1390, the relationship between fatigue in MS and clinical status was explored. They showed that the frequency of fatigue in patients with MS was 65% and in terms of the relationship between fatigue and pyramidal symptoms, cerebellar symptoms, and sensory symptoms associated with fatigue, it was in line with our study. However, regarding to the relation between patient's age and sphincter symptoms; it was in contrast with the current study [13]. Niino et al. in [21] investigate the factors associated with depression apathy and fatigue. They reported that fatigue had no relationship with duration of the disease. These results were in line with this study. The results of this study were consistent with a number of previous studies [22-24]. The discrepancy

between the results of our study and other research may be due to racial differences, differences in lifestyle and environmental differences and differences in data collection.

5. CONCLUSION

Our study showed that the frequency of fatigue in MS Society of Yazd province of Iran was as follows: 41% and 25% suffered from moderate and severe fatigue, respectively. The major objective of this study was to investigate the relationship between fatigue and demographic features (age, sex and marital status), symptoms and sign of the disease. The majority of patients had evidence of fatigue and depression. The results showed the high prevalence of fatigue in MS patients. Due to negative impact of fatigue and depression on treatment compliance and quality of life, evaluation of patients for these factors is necessary.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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