Brief Report

Epidemiological Features of 263 Patients with Multiple Sclerosis Residing in Babol, Iran

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ABSTRACT

BACKGROUND AND OBJECTIVE: Multiple sclerosis (MS) is a chronic, myelin-degenerative disorder, which causes irreversible pathological changes to the central nervous system. The number of patients diagnosed with this condition has increased during the past decade. This study aimed to evaluate the clinical and demographic findings of MS patients in Babol, Iran.

METHODS: This cross-sectional study was carried out on 263 patients diagnosed with MS in Babol, Iran, during a ten-year period. MS was confirmed in all the included patients based on a neurologist's diagnosis and the McDonald's criteria. Age, gender, place of residence, marital and employment status, age at disease onset, and magnetic resonance imaging findings were obtained using a checklist.

FINDINGS: Out of 263 patients, 188 (71.5%) and 75 (28.5%) cases were female and male, respectively. The mean age of the patients was 34.28±9.47 years, and the female to male ratio was 5:2. It was found that 245 (93.2%) patients had relapsing-remitting MS. At the onset of the disease 161(61.2%) and 102(38.8%) of the patients were monosymptomatic and polysymptomatic, respectively.

CONCLUSION: Prevalence of MS was relatively higher in in the female population and the ages of 30 years or less.

KEY WORDS: *Multiple sclerosis, Epidemiology, Neurodegenerative disorder*.

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Introduction

Multiple sclerosis (MS) is a chronic disease characterized by recurrent inflammation and axonal damage as well as myelin destruction and irreversible pathological changes in the central nervous system. MS is the most common chronic disorder of the nervous system that leads to disability and decreased performance in young adults (1, 2). This disease affects 2.5 million people worldwide and its incidence is currently on the rise.

Studies have shown that societies with various social features and unique individualities, such as genetics, environment, and geographical location, are different in terms of prevalence of MS. Epidemiological studies help to identify the possible causes of diseases and can lay the foundation for further studies (3, 4). MS has various symptoms including sensory disturbances (e.g., paresthesia), spinal symptoms (e.g., spasticity and bladder and sexual dysfunction), cerebral symptoms (e.g., tremor and dysarthria), and visual impairment (e.g., optic neuritis). MS is divided into several subtypes according to the course of the disease and symptoms, namely, relapsing-remitting MS (RRMS), primary-progressive MS (PPMS), secondary-progressive MS (SPMS), and progressive-relapsing MS (PRMS).

MS diagnosis is based on clinical evidence and paraclinical findings such as magnetic resonance imaging, lumbar puncture, and visual evoked potential (5). According to Kurtzke, communities are divided into three sub-categories, namely, low (less than five cases per 100,000 population), moderate (5-30 cases per 100,000 population), and high prevalence regions (over 30 cases per 100,000 population) (6,7). According to the abovementioned classification, Iran is a low risk region, while the previous studies have shown otherwise (8).

Therefore, Esfahan is located in a low-risk area, while large-scale epidemiological studies suggest a total number of 35-45 people per 100,000 population in this area; hence, this region is at medium to high risk for MS prevalence. Sensory disorders and visual impairment were reported to be the most common clinical signs of MS (9, 10).

Findings of a study conducted in the past decade on 582 patients with MS indicated that the prevalence of the disease in Mazandaran was 20.1 cases per 100,000 population at the time of the study. Female to male ratio was 6:2 and the most common symptoms were visual impairment (40.1%) and sensory disorder (34.2%). RRMS was the most common (71%) type of MS in the studied population (11). Given the different prevalence of the disease in various populations, clinical signs, and demographic characteristics of patients and absence of statistics related to MS patients in Iran, this study aimed to evaluate the demographic and clinical findings of MS patients.

Methods

This cross-sectional study was performed on patients diagnosed with MS in Babol, Iran, during 2001-2011. After obtaining approval of the Ethics Committee of Babol University of Medical Sciences, the data related to 263 patients diagnosed with MS, according to a neurologist and the McDonald criteria, were obtained (5). Our checklist included items on age, gender, place of residence, marital and employment status, age at disease onset, and clinical and magnetic resonance findings.

According to MacDonald, during the follow-up MS types were classified into primary progressive, secondary progressive, and relapsing-remitting. In case of incomplete medical records, patient death, or not continuing treatment the samples were excluded. T-test and chi-square were performed using SPSS version 18 to analyze the data. *P*-value less than 0.05 was considered significant.

Results

The results showed that 188 (71.5%) and 75 (28.5%) of the samples were female and male, respectively. The mean age at disease onset was 26.6±8.15 years (age range: 13-55 year). Female to male ratio was 5:2. The mean age of females was significantly less than males (p=0.008). Thus, in both genders the prevalence of MS was higher in samples younger than 30 years old (p=0.03). There was not a significant difference between the two genders in terms of level of education and marital status (table 1). On the other hand, most cases of MS were observed in employed men (81.1%) and unemployed women (housewives) (75.4%); moreover, there was a significant difference between the genders in terms of employment status (p=0.001).

Regarding to the type of MS, 245 (93.2%), 14 (5.3%), and 4 (1.5%) patients had RRMS, SPMS, and PPMS, respectively. Movement disorder, optic neuritis, and visual impairment were the most common

clinical signs in the MS patients (fig 1). With respect to the number of symptoms, 161 (61.2%) and 102 (38.8%) patients had monosymptomatic and polysymptomatic MS. The most common sites of MS plaqu in the patients were supertentorium (98.1%), spinal cord (44.1%), the cerebellum (26.2%), and brainstem (23.6%).

Table 1. Comparing the demographic variable in multiple sclerosis patients based on gender

| Variable	Female(N=188) N(%)	Male(N=75) N(%)	P-value
Mean age at onset disease (years) Mean±SD	25.8±8.21	28.6±7.67	0.008
Age at onset disease (years)			
Above 30	45(23.9)	25(33.3)	0.037
Under 30	143(76.1)	50(66.7)	
Level of educational			
Less than high school diploma	121(42.7)	43(57.3)	0.063
More than high school diploma	67(35.6)	32(42.7)	
Employment status			
Employed	16(8.6)	60(81.1)	
Unemployed-housekeeper	141(75.4)	11(14.9)	0.001
Student	30(16)	3(4)	
Marital status			
Single	50(26.9)	19(25.3)	0.12
Married	136(73.1)	56(74.7)	
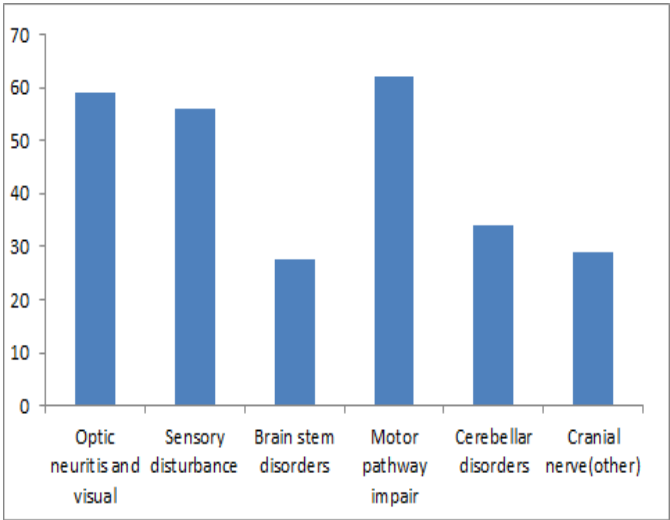
Figure 1. Frequency of symptoms for 263 patients suffering

Discussion

According to the findings of 263 patients diagnosed with MS in Babol, Iran, most of the samples were female (71.5%), and female to male ratio was 5:2. There was a significant difference in the two genders in terms of mean age at onset of MS and employment status. The disease pattern in the majority (93.2%) of samples was RRMS.

In a study conducted during a ten-year period on 8146 Iranian MS patients, female to male ratio was 6:2 and the mean age at onset of the disease was 27.24 years. RRMS was the most frequent (84.9%) MS pattern (8). In a similar study carried out in Esfahan, 1718 cases were diagnosed with MS, the prevalence of the disease was 43.8 per 100,000 cases, and the mean age at onset of MS was 25.36 years. The mean duration of disease for males and females was 7.1 and 6.7 years, respectively. Quite in line with our study, in their study a significant difference was observed between the two genders in terms of age at onset and employment status (10).

In another study carried out in south east of Iran, the prevalence rate of MS was 2.67%, and female to male ratio was 2.18. Most cases of MS were in the 16-35 years age range (12). While the results of this study are in agreement with epidemiological studies in terms of clinical and demographic findings, but various studies carried out in other parts of the world have reported a great variety of epidemiological aspects of MS, this discrepancy might be due to different study designs, diagnostic criteria, patient assessment tools, and racial differences (13, 14).

On the other hand, factors such as socioeconomic condition and trend towards urbanization in Iran are considered as the epidemiological aspects of MS. Saei and colleagues performed a study in Tehran demonstrating that despite the heterogeneous distribution of MS, the prevalence of the disease has a direct linear relationship with socioeconomic status (15). Other studies carried out in other parts of the Middle East demonstrated high prevalence of MS, especially in the Arab regions. MS prevalence in Kuwait has been reported to be 4-42 people per 100,000 cases (16, 17).

The clinical pattern observed in these regions is similar to that of Western countries. The mean age at onset of the disease in the third decade of life fluctuates between 26 and 30 years. Women are more prone to the disease with the gender ratio ranging from 1:1 to 3:1. RRMS was the most common MS pattern,

with the prevalence rate ranging from 60% to 90% among Arabic-speaking countries in the Middle East (18). In the studies done in the Latin America, the prevalence ranged between 1.6 and 19.6 cases per 100,000 population. In those countries, RRMS was the most common MS pattern, which is similar to other studies (19).

In a study performed in Japan, crude incidence of MS was 10.2 per 100,000 cases, which is four times more than the past three decades. Female to male ratio was 8:1, and RRMS was reported the most common disease pattern with the incidence rate of 65% (20). Lau and colleagues carried out a study on 106 patients in Hong Kong. They showed that female to male ratio was 2:3 (21), which was significantly different despite the geographical proximity in comparsion to Japan. According to studies done in the recent decades, the prevalence of MS increases by moving away from the equator and increasing latitude, but epidemiological studies conducted in different parts of the world do not confirm this finding (22, 23). Although Iran is a low risk region according to Kurtzke, but the majority of epidemiological studies have reported an average rate of MS prevalence in this country. The present study evaluated the epidemiological features of MS patients in Babol, Iran, during the past decade. In this study, mean age at onset of MS in Iran was not significantly different from similar studies conducted in other parts of the country; however, the gender ratio was the same. RRMS was the most common MS pattern, which is in agreement to the epidemiologic pattern of the MS.

Our results were in agreement with findings of previous epidemiological studies. Since Iran is at medium risk for MS prevalence, performing epidemiological studies in different population groups and identifying the risk factors for this disease seems to be necessary.

Acknowledgments

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