

## Original Research Article

# Study relationship between multiple sclerosis and migraine

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### ABSTRACT

**Background:** Each person experiences headaches in his/her life. Some studies have shown a significant relationship between Migraine and MS. In these patients there can be a variety of clinical symptoms such as muscle weakness, sensory loss, ataxia, optic neuritis. Optic neuritis in MS is a relatively common symptom that can cause blurred vision, headaches (especially frontal ones) and painful eye movements. Headache is a clinical symptom that makes people visit neurologists. There are several diagnoses for headaches including migraine. In this study, we evaluated the possibility of a significant relationship between migraine and MS.

**Methods:** In this case-control study, 134 MS patients and 134 sex and age matched controls were selected randomly from all patients referred to hospital. Their information about MS and migraine was collected and analyzed by SPSS v.21.

**Results:** The Mean age of cases in this study was  $41.5 \pm 9.4$  years. The gender of 73.13% of patients was female. In MS patients with chronic headaches, 36 people (42.9%) and in Controls 22 people (38.6%) had migraine. In this study it was found that people with MS, experience more migraine attacks compared to the controls (OR=3 and P=0.05). Further investigation showed that, unlike aura type, migraine without aura had a significant relation with the MS (OR=1.94 and P=0.04). Also, it seems that the number of migraine attacks in patients with MS is significantly more than the controls.

**Conclusions:** Finally it seems that there is a positive association between MS and migraine. The relationship between migraine without aura and MS is obvious, but the relation between aura type and MS is not clear, yet.

**Keywords:** Headache, Migraines, MS

### INTRODUCTION

Multiple sclerosis (MS) is one of the most common neurological diseases among young adults. The spread of the disease, which is greater among women than men, is growing day by day. Clinical signs are usually seen at a young age and as involvement of various parts of the central nervous system at different times. Common symptoms of MS include tingling in fingers, visual impairment, diplopia, abnormal gait, muscle weakness and imbalance, in addition to the above symptoms, pain also occurs in the course of the disease. Despite pain is

not of the main symptoms in MS, many MS patients complain of pains, including headaches. Different types of headaches are common in MS patients, which can be caused by the disease, medication side effects, or depression resulting from the disease. These headache can affect the diagnosis, treatment and quality of life in patients. Each person may get headaches over his/her life. However, MS patients get more migraine- like or cluster headaches than ordinary people. There can be a variety of clinical symptoms in MS patients; such as muscle weakness, sensory loss, ataxia, and optic neuritis.<sup>1</sup> Optic neuritis in MS is a relatively common symptom that my

show itself by blurred vision, painful eye movements, and headaches, especially in the frontal part.<sup>2</sup>

Headache itself is also a neurologic clinical sign which makes the patient visit a neurologist. There is probability of several diagnoses for a neurologist to make for a person with headache, one of which is vascular lesions, including migraines. The next diagnoses can be brain tumors or cluster headache attacks and tension-type headaches and finally optic neuritis or vasculitis.<sup>3</sup> International Association of MS, had reported a twofold incidence rate for migraine headaches in these patients compared to healthy people. They have also mentioned that more than 1.3% of them had the history of migraine. This could indicate a common underlying factor in triggering both MS and migraine.

Regarding the controversy among the results of different studies done in various regions on the relationship between MS and migraine headache, and also the increase of MS incidence in Ardabil city, conducting local research studies on this field could yield better insight about the issue and pave the way for taking appropriate actions in the future (1 and 4-9). Considering the above mentioned urge, this study was aimed at examining the relationship between migraine and MS in Ardabil city.

## METHODS

In this case-control study, 134 patients with confirmed diagnosis of MS who had visited neurology clinic in Alavi Hospital were chosen as the case group, and 134 healthy people were chosen as the control group. The two groups were matched in terms of age and gender. The

exclusion criteria in this study were the association of MS with traumatic lesions to the head, having the history of neurosurgery, acute brain stroke, brain tumors, having different types of primary headaches other than migraine.

All the patients were interviewed about having the history of migraine (according to the criteria of International Headache Society (IHS)). The necessary data were collected using checklist and were analyzed using SPSS version 19.

The level of significance in all of the above tests was considered 0.5.

## RESULTS

The Mean age of cases in this study was  $41.5 \pm 9.4$  years. The gender of %73.13 of patients was female (Table 1). Of all the patients, 73.1% had relapsing-remitting (RR) type of MS, and only 3% suffered from primary progressive (PP) type of MS and; among patients with migraine, 86.1% were those with RR and 13.9% with PP.

There were 84 patients (62.7%) in the case group, and 57 patients (42.5%) in the control group who had experienced different types of chronic headaches. Among those patients with MS who had chronic headaches, 36 patients (42.9%), and among healthy people, 22 cases (38.6%) had migraine headaches. The mean duration of headache was  $13.1 \pm 8.6$  hours in the case group and  $14.5 \pm 9.4$  hours in the control group, indicating that the groups were not significantly different from each other in this regard. Moreover, the average age at which the patients had developed MS was  $10.8 \pm 8.8$  in the study group.

**Table 1: Demographic of patients suffering to migraine in two groups.**

Groups variables	Case N (%)	Control N (%)	P-value
<b>Marital status</b>			0.74
Single	13 (36.1)	7 (31.8)	
Marid	23 (63.9)	15 (68.2)	
<b>Family history</b>			0.68
Yes	16 (44.4)	11 (50)	
No	20 (55.6)	11 (50)	
<b>Sex</b>			0.74
Male	8 (22.2)	6 (27.3)	
Female	28 (78.8)	16 (72.7)	
Mean duration of headache (hours)	$13.1 \pm 8.6$	$14.5 \pm 9.4$	0.25
Mean age	$41.5 \pm 9.4$	$39.8 \pm 8.2$	0.36
migraine without aura	31(86.1)	18 (81.8)	

Of 36 migraines suffers in the case group, 31 patients (86.1%) had migraine without aura and the rest had classic migraine (with aura). Also, of 22 migraine

patients in the control group, 18 people (81.8%) suffered from migraine without aura and four people from the classic migraine. On average, the patients in the case

group had experienced about 7 to 12 attacks in a month, which was higher than the controls who had had 4-9 attacks per month ( $P = 0.049$ ,  $OR = 3$ ). Of all effective variables on migraine, stress with 77.2% was the main causes in the case and control groups (Table 2).

**Table 2: Effective variables in occur migraine headache between two groups.**

Groups variables	Case N (%)	Control N (%)
Stress	26 (77.2)	17 (77.3)
Fatigue	22 (61.1)	13 (59.1)
Menstruation	8 (22.2)	6 (27.3)
Food	7 (19.4)	6 (27.3)
More sleep	3 (8.3)	3 (13.6)
none	3 (8.3)	1 (4.5)
others	11 (30.6)	7 (31.9)

Comparing the two groups in respect of having migraine revealed a significant relationship between the risk of developing MS and migraine headaches ( $P = 0.038$ ;  $OR = 1.87$ ). Furthermore, the close investigation showed a significant relationship between MS and headaches without aura ( $P = 0.04$ ;  $OR = 1.94$ ) but no significant relationship between MS and headaches with aura.

## DISCUSSION

In the present study, the mean age of patients with MS was  $41.5 \pm 9.4$  which was comparable to the age of subjects in other studies.<sup>1,2,6,8-11</sup> In a study undertaken by Ashtary, 76% of patients with MS were female.<sup>9</sup> Similarly, in Ashtiani's study, 76.9% of patients with MS were female.<sup>8</sup> In the study by Hamdy et al, females made up 69.4% of all patients with MS and headaches; also, females constituted 68.2% of the patients with MS and without headache.<sup>1</sup> In Zorzon's study, the majority of MS patients were female, and the female to male ratio in this study was 1.8 to 1. Similar results were also observed in Vecca and Nicoletti's studies.<sup>10-12</sup> In the study by Putzki, female to male ratio was 2.13 to 1. Corresponding to above mentioned studies, the women in the present study constituted the majority of people with MS (73.13%).<sup>1,8,9</sup>

Concerning the frequency and subtypes of MS, the results of this study showed that the majority of the patients had developed RR (86.1%) which was consistent with the results of other studies and can be largely related to the prevalence of this subtype of MS compared to other subtypes.<sup>8,14-16</sup>

In the present study, of 134 patients with MS, 36 cases (26.87%) and of 134 healthy people, 22 cases (16.42%) were migraine sufferers. This result is compatible to the results of other studies.<sup>1,8,9</sup> Comparing the two groups in terms of the first time of having migraine was another measured indicator in this study. The comparison showed that the average time of onset of migraine was about  $9.9 \pm 8.6$  years ago in the case group and  $10.4 \pm 9.4$  years

ago in the control group, which indicated no significant difference between them in this respect. Reviewing the literature, no study was found having considered the time of onset of migraines.

In the present study, the frequency of migraine was evaluated in the patients with MS. The cases with MS (66.6%) had experienced between 4 to 15 attacks in a month. As it can be observed, the obtained result, that is, the number of attacks and the obtained percentage, was in line with the result of the study conducted by Tabby.<sup>7</sup>

As mentioned earlier, migraine can be triggered by many environmental variables such as stress, menstruation, and certain foods. In the present study, as well, it was observed that stress, fatigue and menstruation were main environmental reasons for migraines in patients with MS; the point that needs to be considered is the similarity of triggering factors of migraine in the both groups (with MS and without MS). Additionally, it should also be noted that the relationship between stress and exacerbation of MS have already been approved. Present results were consistent with the results of Toby et al.<sup>7</sup>

In this study the majority of patients in both groups were married. The percentage of the single patients with MS was higher than the other group that may have been due to complications of MS. A similar result has also been observed in the Tabby's study.<sup>7</sup> In this study, in both groups, about half of patients with migraine reported positive family history of migraine. But the percentage of positive family history was slightly lower in the case group which is negligible. Similar results have also been observed in the Tabby et al.'s study.<sup>7</sup>

What is obvious in the undertaken studies to date is the higher incidence rate of MS and migraine in females than men, which can be attributed to the greater number of females in the population with MS. The recent assumption has also been fully confirmed in the Kister's study.<sup>6</sup> In this study, as well, the majority of patients with MS and migraine were female. The female to male ratio in these patients was a function of female to male ratio in the population with MS.

The link between migraine and MS was put forward by two researchers named Compston and McAlpine, about half a century ago. These two researchers reported that about 2% of the patients, who had developed MS, within 3 months after the onset of MS symptoms, had suffered from migraines. Later, other researchers began to explore the relationship between these two clinical abnormalities. All studies have confirmed the association between migraine and MS.<sup>2,5,11,13</sup> Some studies such as studies done by Vecca, Katsiari and Nicoletti did not find any significant relationship between MS and migraine with aura.<sup>11,12,14</sup> Conversely, the very researchers found a significant association between MS and the occurrence of migraine without aura. As in the meta-analysis run in the above-mentioned studies the following values were

obtained ( $P= 0.02$ ;  $1.14-4.58$ ,  $OR =2.29$ ).<sup>11,12,14</sup> The present study's results were also quite consistent with the above studies. In the present study, the association between MS and migraine was confirmed ( $P=0.038$ ;  $OR=1.87$ ); Also in the disjunctive analysis, a significant association was only found between MS and headache without aura ( $0.04 = P$ ;  $1.94 = OR$ ).

## CONCLUSION

Results of the study showed that there is a positive association between MS and migraine without aura and further studies are required to be conducted for another type of migraine relation with MS. Also, It is suggested that further studies with larger sample size and several measures and scales to be undertaken at the provincial level, and the results of our study along with symptoms of migraine and MS be exposed to public particularly students in the form of educational banners for enhancing their public knowledge and promotion physician referral.

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