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Prevalence of Multiple Sclerosis (MS) Disease among Saudi Population, KSA: A Cross-Sectional Study

Hessa Sharar Alotaibi[1], Hoda Jehad Abousada[2*], Ahmed Abdullah Alharthi[3], Abdulaziz Ayed Alshammari[4], Manar Naif Bokhari[4], Abdulhakeem Abdullah Attar[4], Talal saleh Alzubaidi[4], Khader Mohammed Almathami[4], Traad Louai Zarei[4], Seham Salem Almohammadi[4], Razan Saleem Alsinani[5], Lama Abdullah Alowaydi[5], Rayan Hussain Alobaidi[5], Anmar Khalid Aljuhani[5]

[1]Consultant Neurologist, Head of Neurology Uni in King Fahad general hospital, Jeddah, KSA

[2]Department of Obestetric and Gynecology physician, KAMC, Jeddah, KSA

[3]Psychiatry residents, Najran, KSA

[4]General Practitioner, KSA

[5]Medical intern, KSA

ABSTRACT

Background: Multiple sclerosis (MS) is an inflammatory disease of the central nervous system that affects the brain and spinal cord and usually begins in early adulthood. The disease still leaves many questions unanswered and its course, symptoms and therapeutic success vary so much from patient to patient that general statements can only be made to a limited extent. For this reason, MS is also known as the "Disease with a 1000 Faces".

Methods: This was an analytical cross-sectional study to spot light on the prevalence of MS among Saudi population. The study was carried out at universities, hospitals and malls in KSA. Data were collected from patients and general population during a period from April to October 2021.

Results: There were 704 females who were the majority of the study (70%) and the rest of participants were males (n=301). Moreover, the most prevalent age group was 20-30 years of age (n=441, 34.9%) and the least age group was more than 50 (n=57, 5.7%). Also, majority of participants were non-smokers (n=853, 84.9%). Furthermore, there were 71 participants had family history of multiple sclerosis (7.1%), and there were 23 participants have multiple sclerosis. With regards to MS risk factors, 477 participants had vit D deficiency, 39 had IBD, 34 had psoriasis, 19 had pernicious anemia, 12 had infectious mononucleosis and 7 had EBV.

Conclusion: Condensed health education programs/campaigns regarding MS for the public via various channels are essential for disseminating transparent information for the early detection and proper management of this devastating disease.

Key words: Multiple sclerosis, Inflammation, Bladder disorders, Dizziness, Sexual dysfunction

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Corresponding author: Hoda Jehad Abousada
E-mail ✉:dr.huda1992@outlook.com
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INTRODUCTION

Multiple sclerosis (MS) is a chronic disease of the central nervous system (CNS: spinal cord and brain, including the optic nerve). It is characterized by relapsing or continuous foci of inflammation in the CNS. Different complaints are the result, for example visual and sensory disturbances, pain or paralysis. So far there is no cure for multiple sclerosis. The course of the disease can be influenced favourably with medication [1].

There are three forms of MS: 1] Relapsing-remitting MS (RRMS) is the most common form of the course. The MS symptoms come on in flares; between the attacks they regress completely or incompletely. 2] Primary progressive MS (PPMS): From the outset, the disease progresses steadily continued-the complaints increase continuously. But there can also be isolated attacks and 3] Secondary progressive MS (SPMS): It develops from the relapsing-remitting MS. That means: After an initially relapsing course, the symptoms eventually increase

progressively (as with PPMS)-with or without attached relapses [2].

More than two million people worldwide have multiple sclerosis. The distribution of the disease is very different from region to region. MS is most common in Europe and North America. Multiple sclerosis usually begins in early adulthood between the ages of 20 and 40. But it can also break out in children and adolescents as well as in older adults [3]. By far the most common form-relapsing-remitting MS - women are two to three times more likely to be affected than men.

LITERATURE REVIEW

It is estimated that around 2.5 million people worldwide live with MS. More than 10,000 people are newly diagnosed with MS each year. Women get sick about twice as often as men. The disease is usually diagnosed between the ages of 20 and 40 - but it also occurs less frequently in childhood and adolescence. Initial diagnoses after the age of 60 are rare [4]. Multiple sclerosis (MS) is also called encephalomyelitis disseminate (ED). This is the Latin name for inflammation that occurs in the brain and spinal cord.

The brain is a kind of control center in which signals are sent to or received from the body via the spinal cord; these are conducted by various nerve fibers which, are surrounded by a protective or insulating layer. This protective layer is made of a substance called myelin. If there is a focus of inflammation in the area of this protective layer, the messages cannot be transmitted as effectively: MS sufferers can then, for example, feel abnormal sensations, stumble more often or have difficulty seeing [5]. The rapid occurrence of one or more sources of inflammation with corresponding physical disorders and failures is called thrust. A flare-up has nothing to do with a sudden attack - it usually develops within hours or days and subsides after a while. However, not every symptom or complaint has to be a flare-up. After the episode, normal function may return or the inflamed nerve tissue may become scarred (sclerosed) [6].

At the beginning of the MS disease, motor disorders often occur - such as paralysis and visual disturbances with blurred or foggy vision as an expression of an inflammation of the optic nerves (optic neuritis). In addition, there are often sensory disorders of the skin ("sensitivity disorders"), mostly in the form of tingling, (painful) abnormal sensations or a feeling of numbness [7]. In addition, a wide variety of complaints such as bladder disorders, insecurity when walking or grasping, double vision and slurred speech can occur.

As the disease progresses, the symptoms of paralysis are often associated with a feeling of stiffness ("like lead on the legs"), called spasticity. Spastic signs of paralysis mainly affect the legs. Bladder disorders can manifest themselves as a frequent, unmanageable urge to urinate (imperative to urinate), a bladder emptying disorder up to incontinence or as a combined damage. In addition, complaints can play an important role, which are often difficult to grasp and see. These include abnormal, premature exhaustion, cognitive disorders, impaired attention, memory and concentration, depressive moods and depression, pain, dizziness and sexual dysfunction [8]. Invisible and visible symptoms of MS can severely impair their independence and ability to act in everyday life and limit their quality of life.

The appearance of MS is very diverse. Most initial symptoms can also correspond to those of other diseases, so it can be difficult, even for an experienced doctor, to classify the symptoms precisely at an early stage [9]. A reliable diagnosis is based on a comprehensive anamnesis, i.e., recording the previous medical history as detailed as possible, and a series of further examinations, which are usually carried out using the following methods: 1] Neurological physical examination, 2] Evoked potentials (nerve conductivity and speed), 3] Lumbar puncture (nerve fluid extraction) and 4] Magnetic resonance imaging (MRI of the brain and spinal cord). Like parts of a mosaic, the various test results enable diagnosis. There is no single finding or examination technique that alone secures MS. For example, even "typical" MRI changes may be based on a different disease. The more parts there are and fit together, the more reliable the picture, i.e., the diagnostic reliability [10]. For orientation, there are internationally recognized diagnostic criteria (the McDonald criteria) that support a diagnosis. Nevertheless, it can sometimes take weeks, months, sometimes even years, until the diagnosis is clearly established [11].

The course of MS can vary greatly from patient to patient. Therefore, it is not possible to make an exact prediction of the individual course. It must be emphasized, however, that MS does not necessarily have to be severe. On the contrary, especially at the beginning of the disease, the inflammatory focus can heal to a large extent and the symptoms that appear can regress. Only in a few cases (less than 5%) does the disease lead to severe disability within a few years [12]. From progress observations it can be deduced that the probability of continuing to have a relatively benign course is higher if the clinical picture is stable after 5 or 10 years. However, due to the unpredictability of the course of the disease, this is not a safe "rule of thumb" and does not speak against therapy after a longer course, for example. At the onset of the disease, the relapsing type predominates with a frequency of up to 90%; after an initially relapsing course, after 10 to 15 years about 30 to 40% change to a secondary chronic progressive course; after more than 20 years, the frequency of this form is up to 90%. About 10% of patients have from the outset a primary - chronic progressive course that is from the beginning a slow deterioration with no clear relapses [13].

The cause of MS is not yet clear. A whole bunch of causes is suspected. While individual factors alone are unlikely to trigger the disease, several conditions seem to have to come together to cause MS (multifactorial development). The exact interaction of these factors is not yet sufficiently known. The body's defenses system, the immune system, plays a central role in this. The immune

system protects against pathogens by rendering them harmless when they enter the body. In MS, a part of this defenses mechanism seems to be programmed incorrectly, that is, it is directed against one's own healthy body. For example, a malfunction within the immune system leads to the formation of antibodies and inflammatory substances which can damage and disturb the myelin, nerve cells and their nerve fibers [14].

The involvement of genetic factors cannot be ruled out either and is being intensively researched. This does not mean, however, that there is a direct inheritance of the disease - what is inherited is rather a "tendency" to possibly develop the disease, a so-called predisposition [15]. Potential factors that can further intensify such a "tendency" are, for example, the influence of environmental factors such as infections in childhood, but also other aspects such as vitamin D and diet.

Although the cause of multiple sclerosis is still not curable, there are treatment options that aim at: to inhibit the acute inflammatory reaction of a flare-up (flare-up therapy), stop the progression of the disease, to extend the symptom-free / poor time (course-modifying therapy) and to relieve MS symptoms and prevent possible complications (symptomatic therapy).

The last two therapeutic areas in particular are usually used in combination. They can be individually adapted for and with the patient, including depending on age, gender, life situation and life planning, as well as accompanying illnesses and the current illness situation.

In the area of symptom treatment, there are not only medicinal but also many non-medicinal therapies available: physiotherapy, occupational therapy, speech therapy, psychotherapy, neuropsychological therapy.

METHODS

Study design

This was an analytical cross-sectional study to spot light on the prevalence of MS among Saudi population.

Study setting

The study was carried out at universities, hospitals and malls in KSA. Data were collected from general population during a period from April to October 2021.

Sampling and sample

Participants were chosen via probability simple random sampling technique. Participants were selected from the general population. The final number of sample size was 800 participants. However, the study included 1005 participants.

Inclusion criteria

General population, MS patients.

Exclusion criteria

None.

Instruments

Data collection tool was self-designed and base on latest literature. It contained the following information: (1) Sociodemographic characteristics: age, gender, nationality, and (2) Disease related information: smoker, risk factors and first symptom.

Statistical analysis

Data was entered and analyzed using SPSS version 23. Descriptive statistics were performed and categorical data was displayed as frequencies and percentages while measures of central tendencies and measures and dispersion were used to summarize continuous variables.

Univariate and multivariate analysis were performed to investigate association between age, gender, nationality, BMI and associated between risk factors of renal impairment. Statistical significance is set at a P value of 0.05 or less.

Permission and ethical considerations

Administrative approval will be sought from the unit of biomedical ethics research committee Ethical approval was sought from the ethical committee of the faculty of medicine, King Abdul-Aziz university. An informed consent was sought from the participants.

RESULTS

The current study objective was to determine the status of multiple sclerosis disease in the Kingdom of Saudi Arabia. The study included 1005 participants. There were 704 females who were the majority of the study (70%) and the rest of participants were males (n=301).

The study included the participation of different age groups. The most prevalent age group was 20-30 years of age (n=441, 34.9%) and the least age group was more than 50 (n=57, 5.7%). Figure 1 shows the distribution of age groups among study participants while Table 1 demonstrates age groups distribution by gender.

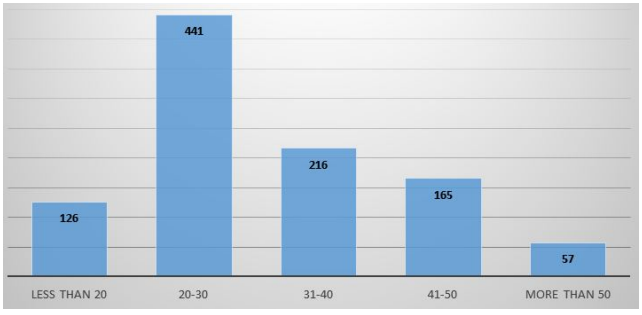

Figure 1: Age groups distribution among study participants.

Table 1: Age group distribution by gender of participants.

Age group	Male	Female
Less than 20	43	83
20-30	140	301
31-40	73	143
41-50	38	127
More than 50	7	50

The study included Saudi and non-Saudi participants. The majority of participants were Saudi (n=923, 91.8%) and the rest of participants were non-Saudi (n=82, 8.2%).

Participants were asked about their smoking status. Majority of participants were non-smokers (n=853, 84.9%). Smoking status of participants is presented in Figure 2.

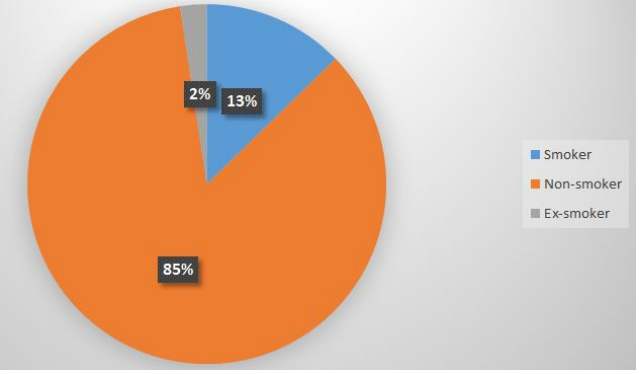

Figure 2: Smoking status among study participants.

The study questionnaire included questions about chronic and comorbid conditions among participants. There were 29 participants had type 1 diabetes mellitus (2.9%), 36 participants had type 2 diabetes mellitus (3.6%) and the rest were diabetes free. There were 89 participants who have thyroid disease (8.9%). There were 71 participants had family history of multiple sclerosis (7.1%).

On asking participants whether they have family history of multiple sclerosis or not, there were 71 participants have family history of multiple sclerosis (7.1%). Participants were asked about some risk factors for developing multiple sclerosis. There were 7 participants had pervious infection of Epstein-Barr virus while 467 participants answered "I don't know". Regarding infection mononucleosis, there were 12 participants had the infection while 358 participants answered "I don't know". Other risk factors such as vitamin D deficiency, pernicious anemia and inflammatory bowel disease are presented in Table 2.

Table 2: Risk factors for multiple sclerosis.

Variable	Frequency	Percent
Epstein-Barr virus	7	0.7
Infectious mononucleosis	12	1.2
Vitamin D deficiency	477	47.5
Pernicious anemia	19	1.9
Psoriasis	34	3.4
Inflammatory bowel disease	39	3.9

On asking participants if they had multiple sclerosis, there were 23 participants have multiple sclerosis.

The presenting complain of those participants is presented in Figure 3.

The most frequent symptom was numbness or weakness in one or more limbs that typically occurs in one side of the body.

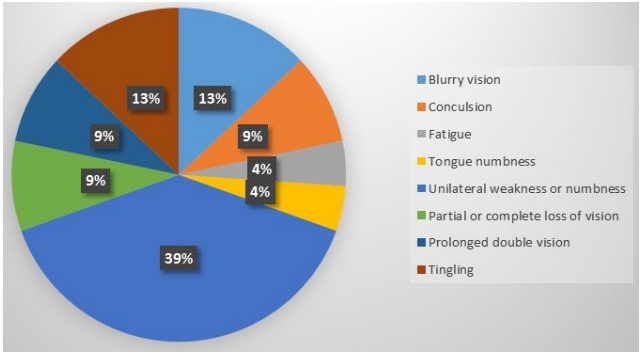

Figure 3: Presenting complains of MS diagnosed participants.

DISCUSSION

Multiple sclerosis is an unpredictable, disabling inflammatory disease of the CNS. Greater awareness and education on the disease lead to the better benefits of early recognition and intervention [16]. A study conducted in Riyadh [17] involving 226 residents that evaluated MS knowledge showed that 30.3% of the respondents were aware and had good knowledge of MS. In Al-Taif, KSA, a community-based study involving 715 participants reported 26% adequate knowledge. On the other hand, the good knowledge prevalence in the present study is much better than that recorded for Majmaah, which was 12.7% average/good knowledge. Generally, public awareness of MS is poor, and this limited understanding delays early diagnosis and treatment [18,19].

In the present study, nearly three-fourths of the participants were female. This agrees with the study in Al-Taif, where 65% of the participants were female [18]. Despite the low level of knowledge, half of the participants recognized MS as a neurological disease affecting the CNS. This agrees with Hudaif et al, [17] who reported a similar percentage of 61%, and was higher than that reported by Amer et al. [18] which was only 14%. In our study, more than 40% of the participants knew that younger people, example those aged 20-30 years old, are more affected by MS. Multiple sclerosis is most commonly first diagnosed between the ages of 20 and 40 years; over time, it results in varying levels of progressive mobility and sensory functional limitations affecting not only function but also appearance [20].

This finding is in line with Hudaif et al [17] and better than that of Amer et al. [18]. The average age of onset of MS is 30 years, which is the age a person typically begins a family and may not have typically reached their full earning potential; MS has a particularly destructive outcome on family, social, and professional relationships. Critical diagnosis and early treatment can prevent the irreversible long-term sequelae in patients with MS [21,22]. There were about 60% of the respondents in the present study answered that vitamin D deficiency, family history of MS, personal history of autoimmune disease, viruses, and obesity were factors that increased the risk of developing MS. This finding is much better than that in the Riyadh, KSA [17] and Al-Taif, KSA studies [18]. There is considerable evidence that vitamin D deficiency may increase susceptibility to MS [23]. Vitamin D deficiency is present in 28-80% of Saudi adults. On the other hand, vitamin D supplementation can eliminate disability [24].

In addition, adolescent obesity and smoking are considered factors that increase the risk of susceptibility for MS [25]. As sensory symptoms are the most common presenting symptoms of MS, nearly two-thirds of the participants (62.9%) in the present study recognized blurred and double vision, numbness, paralysis or weakness, and difficulty concentrating and remembering as common symptoms of MS. Insufficient or lack of information regarding the symptoms of the disease may be the reason behind the late presentation of patients, who miss the opportunity for better disease outcome. Some trials have revealed that early management is vital for delaying MS development, slowing its progression, and reducing disability. Thus, good MS awareness can lead to early diagnosis and prevent complications [26].

In the end, helping others better comprehend MS is the basis to spurring the improvement that changes the lives of those affected by the disease, and will eventually improve their lives and bring a permanent end to complications and disability. In this manner, broad popularization should be actualized to bring information about MS to light, with proficient treatment and to diminish the burden [27].

CONCLUSION

In conclusion, the majority of participants had limited knowledge on MS. This was a known fact from the previous literature. However, in our study we found that the female participants had significantly higher knowledge than the male participants. Also, obtaining knowledge from the Internet or social media; family, friends or neighbors; and health workers was significantly more prevalent among those with good knowledge. In addition, participants who knew someone with MS had significantly higher knowledge levels. Thus, condensed health education programs/campaigns regarding MS for the public via various channels are essential for disseminating transparent information for the early detection and proper management of this devastating disease. Further studies are recommended to clarify the barriers beyond suboptimal knowledge.

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