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Original article

Clinical Patterns and Demographic Characteristics of Multiple Sclerosis Among Libyan Patients Attending Tripoli University Hospital: A Case Series Descriptive Study

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A B S T R A C T

This study aims to evaluate the clinical patterns and demographic characteristics of Multiple Sclerosis (MS) among Libyan patients. A case series descriptive study was conducted at Tripoli University Hospital, including 101 patients diagnosed according to McDonald's criteria between 2010 and 2024. Demographic and clinical data were collected from medical records. Females represented 64.4% of patients, with a peak age of onset between 26 and 35 years. The most common initial presentation was sensory symptoms, particularly numbness (19.8%), followed by decreased visual acuity (18.8%). Many cases were sporadic. These findings demonstrate that MS in Libya shows patterns like global data, with female predominance and young adult onset. The results highlight the need for further large-scale studies to understand disease characteristics in the Libyan population better better better.

Introduction

Multiple sclerosis (MS) is an idiopathic inflammatory demyelinating disorder of the central nervous system characterized by attacks on myelinated axons, leading to varying degrees of myelin and axonal damage. The condition is associated with inflammation, demyelination, gliosis, and neuronal loss. In the early stages, inflammation is temporary, and remyelination occurs, though it is not long-lasting. As a result, the initial progression of the disease is marked by episodes of neurological impairment that typically resolve. Nevertheless, as time progresses, the pathological alterations are increasingly characterized by extensive microglial activation, which is linked to significant and chronic neurodegeneration [1]. Patients may experience a wide range of neurological symptoms, ranging from mild sensory disturbances to severe motor and cognitive impairments, making early diagnosis and intervention critical for improving long-term outcomes [2].

The epidemiology and clinical presentation of MS vary across different geographical regions. In Libya, the clinical presentation of multiple sclerosis (MS) is not well-documented, with most studies primarily addressing prevalence and demographic details rather than the initial symptoms experienced by patients. This deficiency in understanding significantly obstructs the development of effective diagnostic and therapeutic strategies tailored to the Libyan context. Recognizing the specific patterns of initial symptoms is vital for improving the early identification of MS, which is often misdiagnosed or neglected in its early phases due to the nonspecific nature of symptoms like weakness, sensory changes, or visual impairments. This study intends to fill this important gap by analyzing the distribution of initial symptoms in 101 MS patients attending the outpatient neurology department at Tripoli University Hospital. By identifying the most common early symptoms and their demographic distribution, this study seeks to enhance early MS recognition in Libya, inform public health policies, and contribute to the broader understanding of MS in North Africa.

Methodology

Study design: This study is a case series descriptive study.

Study setting and period: The study was conducted at Tripoli University Hospital, Tripoli, Libya. It is a major tertiary referral hospital in Libya for most neurology cases, including MS, over 14 years, from January 2010 to December 2024.

Study population: Medical records of Libyan patients diagnosed with multiple sclerosis based on the McDonald criteria, who attended Tripoli University Hospital during the specified period.

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Study tool: Data were extracted from patient medical records using a predesigned data collection sheet. The sheet was tailored to capture relevant variables, including: Demographics (Age, gender), Clinical Features (Initial presentation, associated symptoms), Diagnostic Findings (MRI findings, cerebrospinal fluid analysis results), and Treatment Details.

Inclusion and Exclusion Criteria

This study enrolled Libyan patients who met specific eligibility requirements. Participants were included if they were Libyan nationals, had a confirmed diagnosis of multiple sclerosis (MS) established according to the McDonald criteria, and possessed complete medical records suitable for analysis. Patients were excluded if their medical records were incomplete or contained missing data, or if they had been diagnosed with neurological disorders other than MS.

Ethical consideration

Ethical approval for the study was obtained from the Libyan Board of Medical Specialties. All patient data were anonymized to ensure confidentiality. Access to medical records was limited to authorized personnel, and the information was used strictly for research purposes.

Data management and analysis

The collected data were entered and analysed using the Statistical Package for the Social Sciences (IBM-SPSS) version 22. Descriptive statistics (mean, frequency, and percentages) were used to summarize demographic and clinical characteristics.

Results

A total of 101 patients diagnosed with Multiple Sclerosis (MS) were included in this study. The following tables and figures summarize the demographics (Age, sex), family history, clinical features (presenting and associated symptoms), and treatment details (specific and supportive treatments) of the study population.

Age and sex distribution

The age of patients at the onset of the disease ranged between 16 and 55 years; most of them (31.7%) were within the age group from 26 – 35 years with a mean age of 31 years (Figure 1).
Females were 65 (64.4%), and males were 36 (35.6%) (Figure 2).

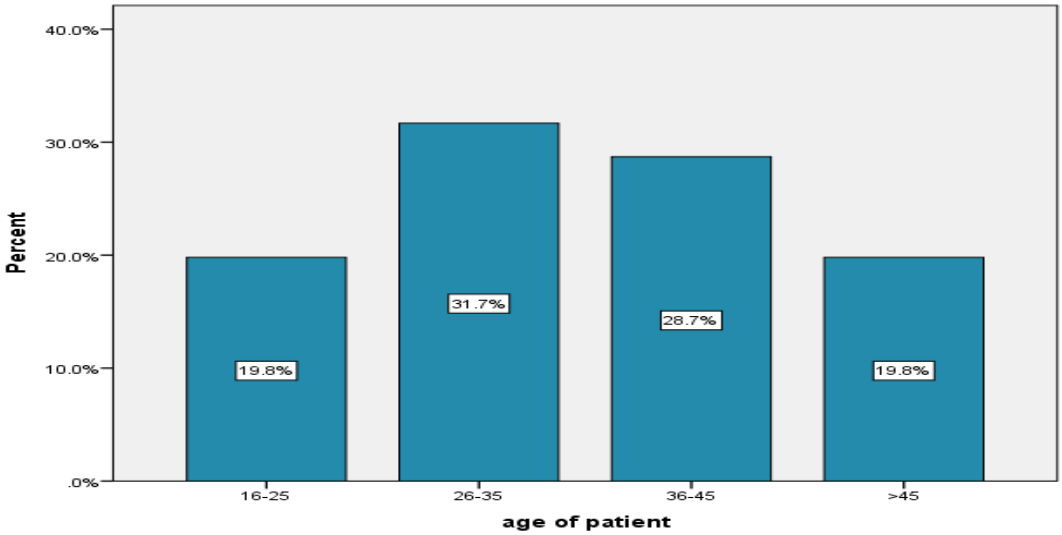

Figure 1. Age distribution of patients with MS (TUH 2010-2024).

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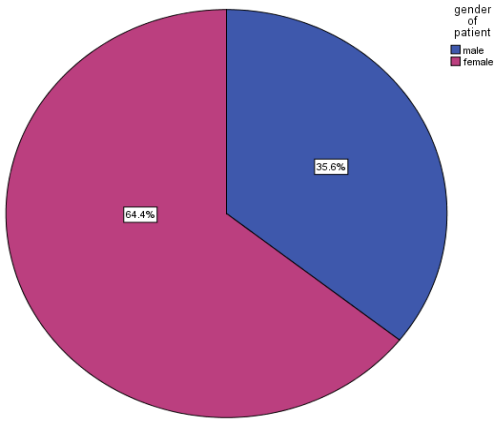

Figure 2. Gender distribution of patients with MS (TUH 2010-2024).

Family History

Most of the patients, 87 (86.1%), had no family history of multiple sclerosis, and only 14 patients (13.9%) had a positive family history (Figure 3).

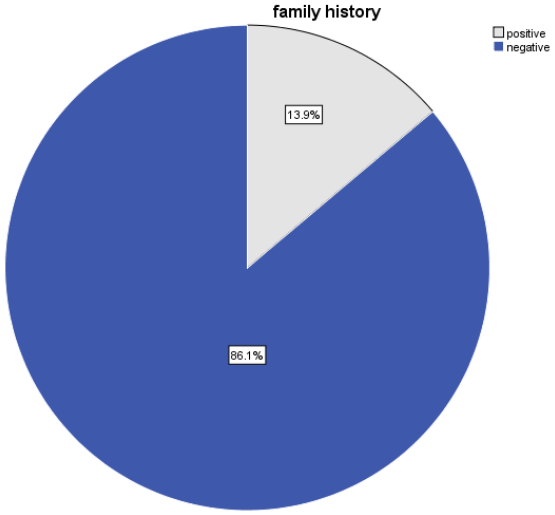

Figure 3. The distribution of family history of multiple sclerosis (TUH 2010 – 2024).

The distribution of presenting and associated symptoms

From a total of 101 patients with multiple sclerosis, sensory symptoms were the most common initial presentations. Numbness in the limbs or face was reported in 20 patients (19.8%), reflecting early involvement of sensory pathways. Decreased visual acuity, commonly associated with optic neuritis, was observed in 19 patients (18.8%), representing the second most frequent presentation. Other less frequent initial presentations included motor, cerebellar, and brainstem-related symptoms, as summarized in the following table (Table 1).

Table 1. The distribution of first presenting symptom of MS (TUH 2010-2024)

Presentation	Number of patients	Percentage
Numbness	20	19.8
Decreased visual acuity	19	18.8
Monoparesis	16	15.8
Unsteadiness	14	13.9
Paraparesis	10	9.9
Hemiparesis	9	8.9
Diplopia	8	7.9
Vertigo	4	4.0
Headache	1	1.0
Total	**101**	**100.0**

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On the other hand, limb weakness and decreased visual acuity were the most frequent relapsing symptoms, which were found in 58 and 57 patients, respectively. Other symptom frequencies are listed in the following table (Table 2).

Table 2. The distribution of associated symptoms and /or symptoms of relapses (TUH 2010-2024)

Symptom	Number of patients	Percentage
Limb weakness	58	57.4%
Decreased visual acuity	57	56.4%
Numbness	54	53.5%
Fatigue	53	52.5%
Unsteadiness	51	50.5%
Urinary bladder dysfunction	32	31.7%
Vertigo	31	30.7%
Dysarthria	31	30.7%
Headache	31	30.7%
Double vision	23	22.8%

The frequency and distribution of Specific and supportive treatment

Interferon beta 1a preparations (Rebif and Avonex) were the most frequently prescribed disease-modifying therapies, accounting for 29.7% and 24.8% of treatments. Followed by Natalizumab (15.8%) which was the most commonly used monoclonal antibody. Other therapies, including Rituximab, Ocrelizumab, Cladribine, Azathioprine, and Cyclophosphamide, were prescribed less frequently. Methylprednisolone was mainly used for the management of acute relapses (Table 3).

Table 3. The distribution of treatment of MS (TUH 2010-2024)

Specific MS treatment	Frequency	Percent
Interferon beta 1a (Rebif)	30	29.7%
Interferon beta 1a (Avonex)	25	24.8%
Natalizumab (Tysabri)	16	15.8%
Interferon beta 1b (Betaseron)	14	13.9%
Rituximab	4	4.0%
Azathioprine	3	3.0%
Ocrelizumab (Ocrevus)	3	3.0%
Cladribine	3	3.0%
Methylprednisolone	2	2.0%
Cyclophosphamide	1	1.0%
Total	**101**	**100.0%**

Vitamin D was the most frequently prescribed supportive treatment, used in 89 patients (88.1%), followed by Vitamin B12 in 66 patients (65.3%). Baclofen was the most commonly used symptomatic therapy for spasticity, prescribed in 36 patients (35.6%), while Oxybutynin was used for urinary symptoms in 20 patients (19.8%). Amitriptyline was prescribed for pain and mood symptoms in 16 patients (15.8%). Omega-3 supplements and Pregabalin were used less frequently (Table 4).

Table 4. The distribution of supportive and symptomatic treatment in MS patients (TUH 2010-2024)

Treatment	Number of patients	Percentage
Vitamin D	89	88.1%
Vitamin B12	66	65.3%
Baclofen	36	35.6%
Oxybutynin	20	19.8%
Amitriptyline	16	15.8%
Omega-3	9	8.9%
Pregabalin	4	3.9%

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Discussion

This study is a descriptive analysis of clinical and demographic features of MS patients in Libya. Our findings were compared to similar studies from the Middle East, North Africa, and other international studies. The age of onset of MS patients in this study ranged from 16 to 55 years, with a mean age at diagnosis of 31 years. Most patients (31.7%) were within the 26–35 age group, reflecting the peak age of MS onset typically occurring in the third and fourth decades of life. This aligns with a Sudanese study conducted at the National Centre for Neurological Sciences in Khartoum (2018), which found that most patients had a mean age of 35 years at disease onset [3]. Another consistent finding in MS epidemiology is the gender distribution of the disease. It is well-established that both the incidence and prevalence of MS are higher in females than in males, although the exact ratios vary across studies. In this study, a female-to-male ratio was approximately 1.8:1. This aligns with the global trend of female predominance, with ratios ranging from 1.8:1 to 3:1. Studies in Kuwait (1.95:1), Egypt (2.57:1), and Jordan (2.77:1) have reported similar findings. The higher susceptibility of females to MS is thought to be influenced by hormonal, genetic, and immunological factors [4,5,6]. This female predominance underscores the need to address unique challenges in managing MS in women, particularly concerning reproductive health, hormonal changes, and the impact of pregnancy on disease activity [7].

A positive family history of MS was reported in (13.9%) of patients, while the majority had no known family history of the disease. This rate of positive family history aligns with findings in some regional studies, which have reported similar prevalence rates. For example, studies in Egypt and Tunisia have shown familial clustering of MS in approximately 10–15% of cases, suggesting that familial cases are relatively uncommon in these populations [5,8]. The relatively low prevalence of familial MS in this study underscores the importance of environmental risk factors, particularly in regions like Libya, where vitamin D deficiency and smoking are prevalent. These findings highlight the need for further research into the specific environmental and genetic interactions that contribute to MS in this population, as well as the development of targeted prevention strategies to address modifiable risk factors.

This study revealed that numbness in the limbs or face (19.8%), followed by decreased visual acuity (18.8%), were the most common initial symptoms in the Libyan patients, aligning with MS pathophysiology. This is consistent with findings from a Sudanese study, where sensory and ocular symptoms were the most frequent presentations [3]. Similarly, research conducted in Egypt reported sensory symptoms, such as numbness and paraesthesia, as predominant early manifestations of MS [5]. These findings emphasize the central role of sensory involvement in early MS presentation across the region. In contrast to the initial presentations, the most frequent symptom associated with relapses or disease progression in this study was limb weakness (57.4%), aligning with global patterns of relapse-associated symptoms in MS and emphasizing the importance of motor involvement as the disease progresses. The high frequency of fatigue in this group highlights its significant impact on patients' quality of life, a finding consistent with studies from Egypt, Saudi Arabia, and international settings [5,9].

The distribution of treatments among MS patients in this study demonstrates a reliance on established disease-modifying therapies (DMTs), particularly interferon-based treatments (Rebif and Avonex), which account for (54.5%) of prescriptions. This pattern aligns with regional trends observed in North Africa and the Middle East, where interferon-beta remains the most prescribed first-line DMT due to its affordability and widespread availability. While monoclonal antibodies, particularly Natalizumab, are increasingly used in Libya for patients with more aggressive disease courses, high-income countries such as the United States and European nations have shifted toward newer DMTs as first-line therapies due to their superior efficacy and convenience [10]. The widespread use of Vitamin D and Vitamin B12 in this study reflects their perceived importance in MS management, both for immune modulation and neurological health.

These findings underscore the importance of individualized care, addressing both disease-related and lifestyle factors to optimize patient outcomes. Increasing access to newer therapies, improving healthcare infrastructure, and promoting awareness of dietary interventions could significantly enhance the management of MS in Libya, particularly for patients with aggressive or refractory disease.

This study has some limitations, including a single-center setting and a relatively small sample size, which may limit the generalizability of the findings to the broader Libyan population. Also, it focused on initial presentations and demographics without assessing disease progression, response to treatment, or long-term outcomes. Further prospective studies with larger sample sizes and longer follow-up are warranted to further explore regional variations in MS presentation and progression.

Conclusion

This study highlights the clinical patterns of multiple sclerosis, emphasizing that sensory symptoms such as numbness and decreased visual acuity are the most common initial presentations. These results provide valuable insights into MS presentation in Libya and highlight the importance of regional

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comparisons to optimize care strategies.

Conflicts of Interest
The author declares no conflicts of interest.

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