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CLINICAL AND EPIDEMIOLOGICAL CHARACTERISTICS OF MULTIPLE SCLEROSIS IN THE FERGANA VALLEY

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Abstract. Multiple sclerosis is a chronic autoimmune disease of the central nervous system with a multifactorial etiology and a heterogeneous clinical course. The aim of this study was to investigate the clinical, epidemiological, and demographic characteristics of multiple sclerosis among patients living in the Fergana Valley. The analysis included clinical forms of the disease, age at onset, gender distribution, disease course, and relapse frequency. The findings indicate that multiple sclerosis in this region is characterized by a relatively later age of onset, a predominance of the relapsing–remitting course, and specific features of neurological deficits. The results highlight the influence of regional, climatic, geographic, and socio-environmental factors on the development and clinical progression of multiple sclerosis and may contribute to improving diagnostic strategies and optimizing therapeutic and preventive measures.
Keywords: Multiple sclerosis; Fergana Valley; clinical characteristics; epidemiology; disease course; neurological deficits.

Introduction. Multiple sclerosis (MS) is a chronic autoimmune disease of the central nervous system, characterized by demyelination and progressive neurological deficits. The disease manifests with a wide spectrum of clinical symptoms, including motor impairments, sensory disturbances, cognitive dysfunction, and fatigue. The etiology of MS is multifactorial, involving genetic predisposition, immune system dysregulation, infections, and environmental influences.
Despite numerous studies on MS in different regions of the world, data on the clinical and epidemiological characteristics of the disease in Uzbekistan, particularly in the Fergana Valley, remain limited. Regional factors, including climatic, geographic, and socio-economic conditions, may influence disease course, age at onset, and clinical presentation.
The aim of this study was to investigate the clinical, demographic, and epidemiological characteristics of multiple sclerosis in patients living in the Fergana Valley, with the purpose of identifying region-specific features of the disease and optimizing diagnostic and therapeutic strategies.
Materials and Methods. Study Design: A prospective single-center observational study was conducted, including patients diagnosed with multiple sclerosis (MS) living in the Fergana Valley.
Inclusion Criteria:
1. Confirmed diagnosis of MS according to the 2017 McDonald criteria;
2. Age ≥18 years;
3. Patient consent to participate in the study.

Exclusion Criteria:
1. Presence of other severe neurological or autoimmune diseases;
2. Refusal to participate in the study.

Data Collection: demographic data: age, sex, place of residence; clinical characteristics: MS type (relapsing-remitting, secondary-progressive, primary-progressive), age at onset, disease duration, relapse frequency; neurological assessment: functional status evaluated using the EDSS (Expanded Disability Status Scale); comorbidities and lifestyle factors.
Data Analysis: statistical analysis was performed using descriptive statistics (mean, standard deviation, median); group comparisons were conducted using χ^2 test, t-test, or ANOVA depending on the data type; statistical significance was considered at $p<0.05$.
Results. A total of 120 patients with multiple sclerosis from the Fergana Valley were included in the study. The mean age was 35.6 ± 9.4 years, with 72 women (60%) and 48 men (40%).

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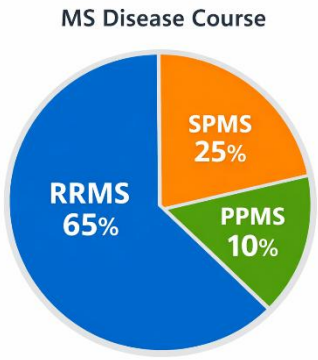
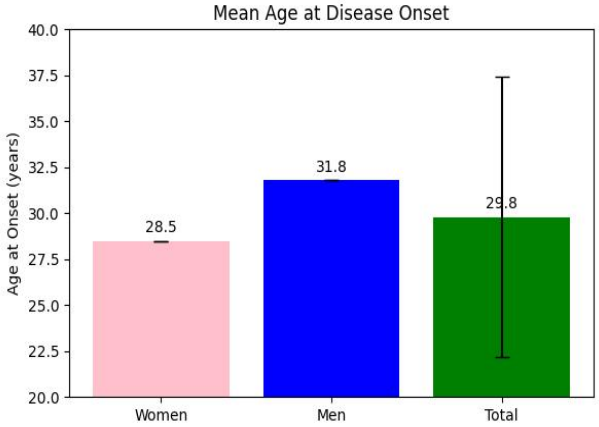


Disease course:
-Relapsing–remitting MS (RRMS) was observed in 78 patients (65%);
-Secondary-progressive MS (SPMS) in 30 patients (25%);
-Primary-progressive MS (PPMS) in 12 patients (10%). (fig.1)

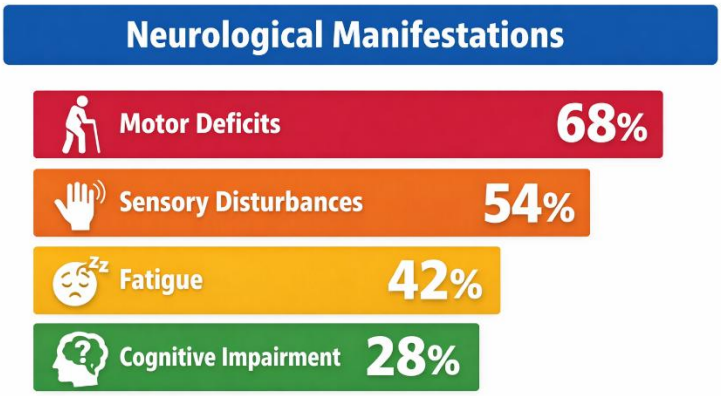
Age at onset:

-The mean age at disease onset was 29.8 ± 7.6 years.

-Women had a mean onset age of 28.5 years, men 31.8 years. (fig.2)



Relapse frequency:
The mean number of relapses during the first year after diagnosis was 1.8 ± 0.6.
Neurological manifestations:
-Motor deficits were observed in 68% of patients;
-Sensory disturbances in 54%;
-Fatigue in 42%;
-Cognitive impairment in 28%. (fig.3)



These results indicate that patients in the Fergana Valley predominantly have a relapsing–remitting course of MS, a relatively later age of onset, and a high level of functional preservation in the early stages of the disease.

Discussion/ The findings of this study provide important insights into the clinical and epidemiological characteristics of multiple sclerosis (MS) in the Fergana Valley. Consistent with global trends, the majority of patients exhibited a relapsing–remitting course (65%), while secondary-progressive and primary-progressive forms were less common. This distribution aligns with reports from other regions, suggesting that RRMS is the predominant clinical form at disease onset.

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The mean age at onset in this cohort was 29.8 years, with women presenting slightly earlier than men (28.5 vs. 31.8 years). This is comparable to international data, indicating that MS typically affects young adults, but the slightly later age of onset in this region may reflect specific environmental, genetic, or socio-economic influences in the Fergana Valley.

Neurological manifestations were heterogeneous, with motor deficits (68%) and sensory disturbances (54%) being the most frequent. Fatigue and cognitive impairment were reported in 42% and 28% of patients, respectively, highlighting the multifaceted impact of MS on daily functioning. These findings emphasize the need for comprehensive clinical assessment and individualized management plans to address both physical and cognitive symptoms.

The regional context may play a significant role in disease presentation and progression. Factors such as climate, geography, lifestyle, and access to healthcare could influence both the age at onset and the frequency of relapses. The mean relapse rate during the first year after diagnosis (1.8 ± 0.6) indicates moderate disease activity, which may be mitigated by early diagnosis and treatment strategies.

Overall, this study contributes to a better understanding of MS in Central Asia and underscores the importance of region-specific epidemiological data. The results can inform local diagnostic approaches, therapeutic interventions, and preventive strategies, ultimately improving patient outcomes and quality of life. Future studies with larger cohorts and longitudinal follow-up are recommended to further elucidate environmental and genetic factors affecting MS in this region.

Discussion. This study highlights the clinical and epidemiological features of multiple sclerosis (MS) in the Fergana Valley. Most patients (65%) had a relapsing–remitting course, with secondary-progressive and primary-progressive forms being less common. The mean age at onset was 29.8 years, slightly earlier in women than men.

Neurological deficits were frequent, with motor impairments (68%) and sensory disturbances (54%) most common, while fatigue (42%) and cognitive dysfunction (28%) also affected patients. The mean relapse rate in the first year was 1.8 ± 0.6, indicating moderate disease activity.

These findings suggest that MS in the Fergana Valley presents similarly to global trends but may be influenced by regional factors such as environment, lifestyle, and healthcare access. Understanding these characteristics can help optimize diagnosis, treatment, and preventive strategies. Further research with larger cohorts and long-term follow-up is needed to explore regional influences on disease progression.

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