

# The prevalence of multiple sclerosis in Tehran, Iran, in 2020

Received: 10 Sep. 2022  
Accepted: 02 Nov. 2022

Sharareh Eskandarieh, Saeideh Ayoubi, Mohammad Ali Sahraian

Multiple Sclerosis Research Center, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran

## Keywords

Prevalence; Multiple Sclerosis; Iran

There are regions in the world with a significant increase in the prevalence of multiple sclerosis (MS). The globally estimated number of patients with MS was 2,221,188 in 2016 that is equivalent to 30.1 cases per 100000 population [95% uncertainty interval (UI): 27.5-33.0].<sup>1</sup>

The Middle-East and North Africa (MENA) region had a high prevalence of MS between 1970 and 2015.<sup>2</sup> Iran had the highest prevalence of MS among the countries of the Eastern Mediterranean region (EMR) (72.11/100000).<sup>3</sup>

Tehran is the most populous city in Iran, and the capital of this country. The prevalence of MS in Tehran was 79.3 cases per 100000 people in 2006 which increased to 162.38 cases per 100000 people [95% confidence interval (CI): 160.27-164.52] in 2019.<sup>4</sup>

A longitudinal cross-sectional study was designed to compare the latest prevalence rate and the risk of MS in Tehran to previous years. This study was based on data obtained from Iranian MS Society (IMSS) registry system in Tehran between 1999 and 2020.

IMSS provided patients with a wide range of facilities, and neurologists encouraged patients to enroll in IMSS to receive care and treatment services.

Patients with MS were examined by experienced neurologists, and their diagnosis of MS and its types was based on the McDonald criteria.

Data about the patients MS is carefully collected based on the experts' opinion and the MS registration system with a designed questionnaire in MS research center of Tehran University of Medical Sciences.

This questionnaire, covered the essential epidemiological variables to risk for MS recurrence including the age of disease onset, sex of the subjects, and history of familial MS (FMS).<sup>4</sup> The validity and reliability of this questionnaire are described in our previous study.<sup>5</sup>

Patients were asked if they had people affected by MS among their relatives, and if the patient answered yes, interviewers asked about the degree of their relationship to the person affected with MS (first-, second-, or third-degree relatives).

Before accepting the registry procedures by patients, the aims of IMSS registry were well explained to them by the interviewers.

The MS prevalence approximation was calculated by the population information achieved from the Statistical Centre of Iran.

**How to cite this article:** Eskandarieh S, Ayoubi S, Sahraian MA. The prevalence of multiple sclerosis in Tehran, Iran, in 2020. *Curr J Neurol* 2023; 22(1): 63-4.

Based on the results of population census, that was performed in Iran in 2020, the population of Tehran was 13973000, of which, 7016000 were men and 6957000 were women.

For estimating the odds ratio (OR) for variables to assess factors associated with pediatric and familial MS recurrence rates, chi-square and logistic regression tests were used.

A total of 23411 cases were registered at this study, including 17,577 women (75.1%) and 5832 men (24.9%) (female to male ratio: 3.016). The prevalence of MS in 2020 in Tehran was 167.54 cases per 100000 people including 252.65 per 100000 among women and 83.15 per 100000 among men.

The mean age of MS onset was 29.02 years [standard deviation (SD): 8.79] at prevalence year with mode of 25 years. The minimum and maximum age of MS onset was 3 and 70 years old.

Generally, 149 cases (6.6%) were below 18 years old (pediatric group), 18001 (80.3%) were between 18 and 39 years old, and 2,930 (13.1%) were 40 years old or over. Relapsing-remitting MS contained 74% of cases, 17.5% were primary progressive MS and 8.4% were secondary progressive MS.

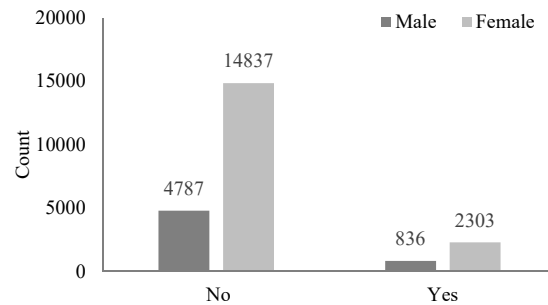
Totally, 3139 participants (13.4%) had a positive family history of MS, 836 men (14.3%) and 2303 women (13.10%) ( $P = 0.006$ ,  $OR = 1.11$ , 95%  $CI: 1.05-1.26$ ) (Figure 1); among them, 1302 cases (41.47%) had positive family history in their first-degree, 492 (15.67%) in their second-degree, and 911 (29.02%) in their third-degree relatives, and 434 (13.91%) in other relatives. We observed a significant relationship between positive family history of MS and pediatric age group ( $P = 0.030$ ,  $OR = 1.25$ , 95%  $CI: 1.05-1.51$ ).

MS prevalence in Tehran has increased compared to previous studies, but steady in comparison to 2018, which may be due to the coronavirus disease 2019 (COVID-19) epidemic and no referral of all patients for registration.

Tehran is one of the cities with the highest MS

prevalence rate in Asia.<sup>1,2</sup>

Among 22 EMR countries, the highest age prevalence rate (as 72.11 per 100000) and the highest age-standardized years lived with disability rate (as 18.03 per 100000) was estimated in Iran.<sup>3</sup>



**Figure 1.** Familial multiple sclerosis (MS) based on different gender

MS is more common in women and young people.<sup>1</sup> Having a family member with MS can increase the risk of pediatric MS, and risk of FMS was substantially higher among men and first-degree relatives which emphasizes the important role of genetic and environmental factors pathogenesis.<sup>4</sup>

It is important that governments and health-care providers be aware of increasing MS prevalence trends for providing adequate services and equipment, and planning future rehabilitation for decreasing burden of MS in country.

Registries could help better detection of individual patients and report of their social and healthcare needs.

#### Conflict of Interests

The authors declare no conflict of interest in this study.

#### Acknowledgments

This study was funded by Tehran University of Medical Sciences (TUMS), Tehran, Iran (No. IR.TUMS.NI.REC.1399.069).

#### References

1. GBD 2016 Multiple Sclerosis Collaborators. Global, regional, and national burden of multiple sclerosis 1990-2016: A systematic analysis for the Global Burden of Disease Study 2016. *Lancet Neurol* 2019; 18(3): 269-85.
2. Yamout BI, Assaad W, Tamim H, Mrabet S, Goueider R. Epidemiology and phenotypes of multiple sclerosis in the Middle East North Africa (MENA) region. *Mult Scler J Exp Transl Clin* 2020; 6(1): 2055217319841881.
3. Sahraian MA, Heydarpour P, Moradi-Lakeh M, Eskandari S, Fereshtehnejad SM, Vosoghi K, et al. Burden of multiple sclerosis in Eastern Mediterranean region (1990-2016): Findings from the 2016 Global Burden of Disease Study. *medRxiv* 2019; 19005918.
4. Nasiri M, Maroufi H, Sahraian MA, Eskandari S. Prevalence of multiple sclerosis and its risks in Tehran, Iran, in 2019. *Neurol Sci* 2021; 42(6): 2575-6.
5. Shahin S, Eskandari S, Moghadasi AN, Razavian N, Baghbanian SM, Ashtari F, et al. Multiple sclerosis national registry system in Iran: Validity and reliability of a minimum data set. *Mult Scler Relat Disord* 2019; 33: 158-6.