6th MENACTRIMS CONGRESS
December 10-11, 2021
Intercontinental Hotel, Dubai

Hosted by
MENACTRIMS
Middle East North Africa Committee for
Treatment and Research in Multiple Sclerosis

POSTER PRESENTATION

Prevalence of MS in Tehran, Iran in 2020 and its forecast for the next 10 years

Sharareh Eskandarieh*, Saeideh Ayoubi, Mohammad Ali Sahraian
Multiple Sclerosis Research Center, Neuroscience Institute, Tehran University of Medical Sciences, Tehran, Iran

INTRODUCTION

The Middle-east and North Africa (MENA) region had a high prevalence of MS between 1970 and 2015 (1-2). Iran had the highest prevalence of MS among the countries of the Eastern Mediterranean region (72.11/100000) (3).

The prevalence of MS in Tehran was 79.3 cases per 100000 people in 2006 which increased to 162.38 (95%.CI:160.27-164.52) cases per 100000 people in 2019 (4).

AIM

To evaluate the prevalence and development of MS in Tehran in 2020 and forecast the future condition of the disease for the next ten years.

Table 1. The results of BSTS model for assessing the development of MS

Data	Variable	Beta	SE	P-value
All	Female	0.249	0.029	<0.001
	Age	0.011	0.001	<0.001
	Familial	-1.919	0.110	<0.001
Sporadic	Female	0.034	0.007	<0.001
	Age	0.009	0.007	0.205
Familial	Female	0.020	0.001	<0.001
	Age	0.009	0.002	<0.001

BSTS= Bayesian Structural Time Series model

Figure 1. The prevalence of MS from 1987 to 2030 (prevalence in 100,000 population)

- MS prevalence rate and 95% CI
- Familial MS prevalence rate and 95% CI
- Sporadic MS prevalence rate and 95% CI

METHODS

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

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

IMSS provided patients with a wide range of facilities and neurologists encouraged patients to enroll in IMSS to receive care and treatment services. Data about MS patients is carefully collected based on opinion of experts and the MS registration system (5). Before accepting the registry procedures by patients, the aims of IMSS registry were well explained to them by the interviewers.

The basic characteristics of patients, including the age of onset, age and sex of the subjects and history of familial MS were collected (4).

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

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

Table 2. Forecasting the prevalence (95% confidence interval) of MS from 2020 to 2029 (prevalence in 100,000 population)

Year	Total MS	Familial MS	Sporadic MS
2020	189.50 (183.94-195.14)	25.69 (24.97-26.45)	163.74 (159.06-168.57)
2021	193.00 (184.6-201.28)	26.26 (25.18-27.39)	166.6 (159.61-173.82)
2022	196.50 (184.42-208.02)	26.83 (25.23-28.35)	169.45 (159.15-179.16)
2023	199.97 (183.79-215.27)	27.4 (25.24-29.49)	172.32 (158.38-185.68)
2024	203.45 (182.7-222.98)	27.96 (25.17-30.61)	175.11 (157.29-192.05)
2025	206.93 (181.19-231.26)	28.53 (25.1-31.83)	177.96 (155.73-199.19)
2026	210.41 (179.31-239.54)	29.09 (24.92-33.11)	180.82 (154.02-206.5)
2027	213.87 (176.92-248.41)	29.66 (24.72-34.46)	183.63 (151.76-214.43)
2028	217.36 (174.36-257.50)	30.23 (24.47-35.72)	186.51 (149.58-221.73)
2029	220.84 (171.48-266.92)	30.79 (24.16-37.15)	189.33 (146.97-230.19)

RESULTS

A total of 23411 cases were registered at this study, including 17577(75.1%) females and 5 834 (24.9%) males (female/male ratio = 3.016). The prevalence of MS in 2020 in Tehran was 16 7.54cases per 100000 people including 252.65 per 100000 among females and 83.15 per 100000 among males.

The Bayesian Structural Time Series model (BSTS) model was used for forecasting and the prevalence rate (95% confidence interval).

The results of BSTS model for evaluating the prevalence rate of MS using covariates are shown in Figure 1. A monotone increase in MS prevalence is predicted for the next ten years after 2020 (Figure 1).

Prevalence rate for MS in the total, familial and sporadic in 2029 and ends with 220.84 (171.48-266.92), 30.79 (24.16–37.15), and 189.33 (146.97-230.19) in 2029 (Table 1- 2).

CONCLUSIONS

Tehran is one of the cities with the highest MS prevalence rate in Asia (1, 2).

MS prevalence in Tehran has increased compared to previous studies and will increase in early future.

MS is more common in women and young people (1). Having a family member with MS can increase the risk of pediatric MS. Risk of positive familial history was substantially higher among males (4).

It is important to study the diagrams forecasting the disease pattern for the next few years, in order to build strategies and acquire appropriate coping preparations. We forecasted a new, substantial outbreak of MS in the next decade, considering the recent growth pattern in disease exploration. If the appropriate infrastructures for tracking and handling these patients are not considered, the future wave will cause a variety of adverse consequences. It's worth 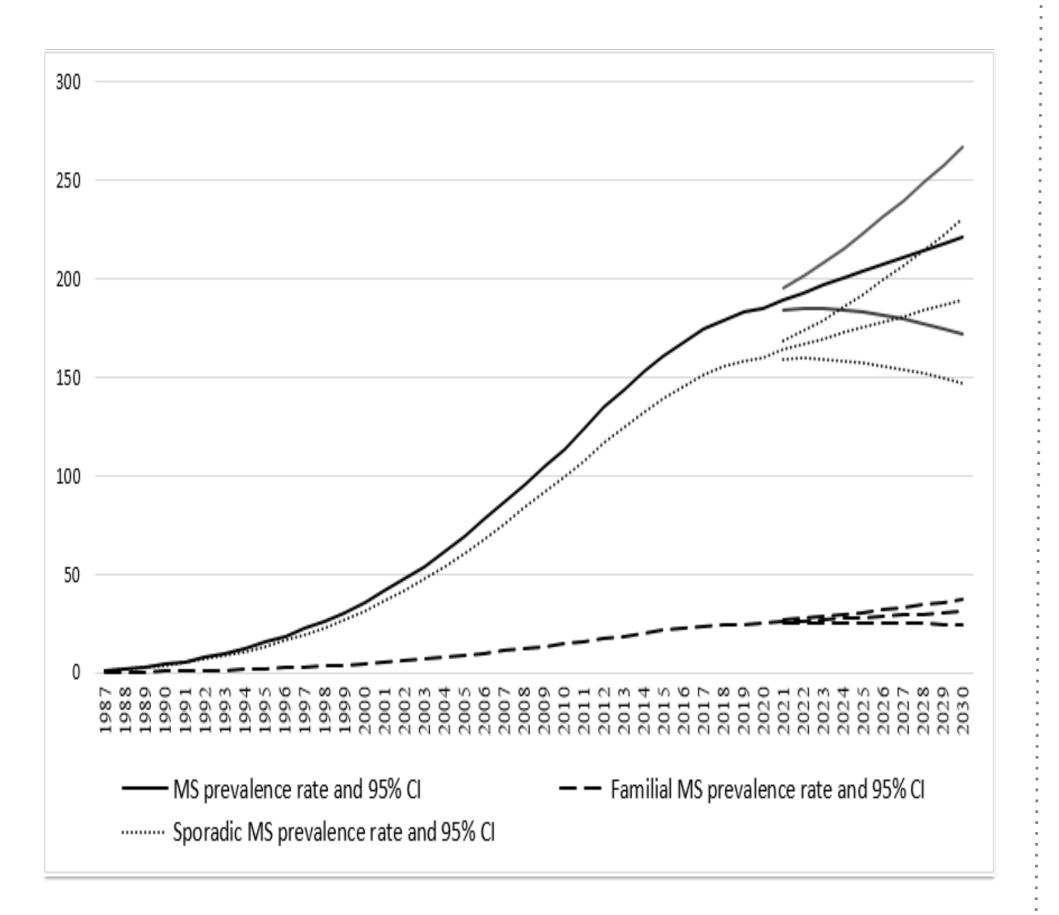mentioning that, owing to the disease's low mortality rate, patients live for a long time and this will raise the disease's cumulative prevalence rate during years (3).

BIBLIOGRAPHY

1.Global, regional, and national burden of multiple sclerosis 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet Neurology* 2019; 18: 269-285. 2019/01/27. DOI: 10.1016/s1474-4422(18)30443-5.

2.Yamout BI, Assaad W, Tamim H, et al. Epidemiology and phenotypes of multiple sclerosis in the Middle East North Africa (MENA) region. *Mult Scler J Exp Transl Clin* 2020; 6: 2055217319841881-2055217319841881. DOI: 10.1177/2055217319841881.

3.Sahraian MA, Heydarpour P, Moradi-lakeh M, et al. Burden of Multiple Sclerosis in Eastern Mediterranean Region (1990-2016): Findings From the 2016 Global Burden of Disease Study. *medRxiv* 2019: 19005918. DOI: 10.1101/19005918.

4.Prevalence of multiple sclerosis and its risks in Tehran, Iran, in 2019.
Nasiri M, Maroufi H, Sahraian MA, Eskandarieh S. Neurol Sci. 2021 Jun;42(6):2575-2576. doi: 10.1007/s10072-021-05064-x. Epub 2021 Jan 18. PMID: 33462634

5.Shahin S, Eskandarieh S, Moghadasi AN, et al. Multiple sclerosis national registry system in Iran: Validity and reliability of a minimum data set. *Multiple Sclerosis and Related Disorders* 2019; 33: 158-161. DOI: 10.1016/j.msard.2019.06.009.