FAMLIAL MULTIPLE SCLEROSIS RISK IN IRAN
A POPULATION-BASED REGISTRY STUDY

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INTRODUCTION

In recent years, the prevalence and incidence of both Sporadic MS (SMS) and Familial MS (FMS) have been increased in Iran (1, 2). Admittedly, little is known about the epidemiological signatures of familial multiple sclerosis (FMS) in different geographical regions of Iran.

OBJECTIVES

To determine Epidemiology and the risk of FMS in several provinces of Iran with different ethic population including, Fars, Tehran, Isfahan (Persians), and Mazandaran (Mazanis), Kermanshah (Kurds), Chaharmahal and Bakhtiari (Lors).

DATA ANALYSIS

All tests were performed at a significance level of 0.05 using Stata software 13 (Stata Corp, College Station, TX, USA).

METHODS

- **Study population**

This cross-sectional registry-based study was conducted on clinically definite MS patients based on the incidence data recorded between 2018 and 2020 through nationwide MS registry of Iran (NMSRI) (3). Patients who were the only family member with MS were classified into Sporadic MS. Further, to be classified as an FMS case, the patients had to have at least one affected relative.

- **The NMSRI**

It was launched in 2018 with a high reliability and validity. The registry is a population-based study which collects epidemiological features such as the prevalence, incidence, clinical presentations and symptoms, diagnostic and treatments, hospital course and outcomes of MS by recording the patient data gathered with the received reports from all neurological departments at Iranian hospitals, clinics, and the Iranian MS Society (IMSS) along with the follow-up (3).

RESULTS

- A total of 9200 patients including 7003 (76.1%) female and 2197 (23.9%) male, were participated.
- About 19% of patients reported a family history of MS; the order from highest to lowest FMS prevalence was as follows: Fars (26.5%), Chaharmahal and Bakhtiari (21.1%), Tehran (20.5%), Isfahan (20.3%), Mazandaran (18.0%), Kermanshah (12.5%).
- Of all FMS cases, 18.7% (1322 cases) were female and 20.1% (442 cases) were male (P-value = 0.135).
- FMS occurrence was much more common in females than males in Fars (P-value = 0.001) and vice versa in Mazandaran (P-value = 0.017) (Table 1).
- Further, the mean age at onset was 30 years among FMS cases (Table 1).
- A substantially higher probability of relapsing-remitting MS and secondary- progressive MS was found among FMS cases than sporadic MS (SMS) (P-value = 0.001) (Fig. 1).
- There was no significant difference in EDSS score between FMS and SMS.
- The majority of FMS cases were observed among first-degree relatives, with the highest rate in siblings (Fig. 2).

Table 1. Comparison of FMS frequency and demographic variables

Variables		Tehran	Mazandaran	Chaharmahal	Kermanshah	Isfahan	Fars	Total
FMS (%)		679 (20.5)	306 (0.18)	81 (21.1)	182 (12.5)	417 (20.3)	85 (26.5)	1750 (19.0)
SMS (%)		2632 (79.5)	1372 (81.8)	303 (78.9)	1267 (87.4)	1640 (79.3)	236 (73.5)	7450 (81.0)
Age (S.D.)	FMS	30.2 (8.7)	30.5 (8.7)	30.8 (7.7)	32.2 (9.9)	31.1 (9.0)	29.2 (7.6)	30.7 (8.8)
	SMS	30.5 (9.0)	29.9 (8.6)	31.0 (7.4)	31.1 (9.4)	30.9 (9.3)	31.3 (8.4)	30.6 (9.1)
	P_value	0.462	0.346	0.847	0.162	0.801	0.075	0.956
FMS	Female	516 (20.2)	204 (16.8)	67 (22.0)	137 (12.1)	308 (19.8)	76 (30.5)	1308 (18.7)
	Male	163 (21.4)	102 (21.9)	14 (17.5)	45 (14.2)	109 (21.7)	9 (12.5)	442 (20.1)
	P_value	0.479	0.017	0.368	0.314	0.372	0.001	0.135
FMS age (S.D.)	Female	30.2 (8.5)	30.3 (8.6)	31.2 (8.1)	32.7 (9.7)	30.8 (8.7)	29.3 (7.8)	30.6 (8.7)
	Male	30.1 (9.2)	30.9 (9.1)	28.8 (6.0)	31.0 (10.5)	32.2 (9.8)	28.2 (4.8)	30.8 (9.4)
	P_value	0.861	0.606	0.287	0.338	0.216	0.752	0.819

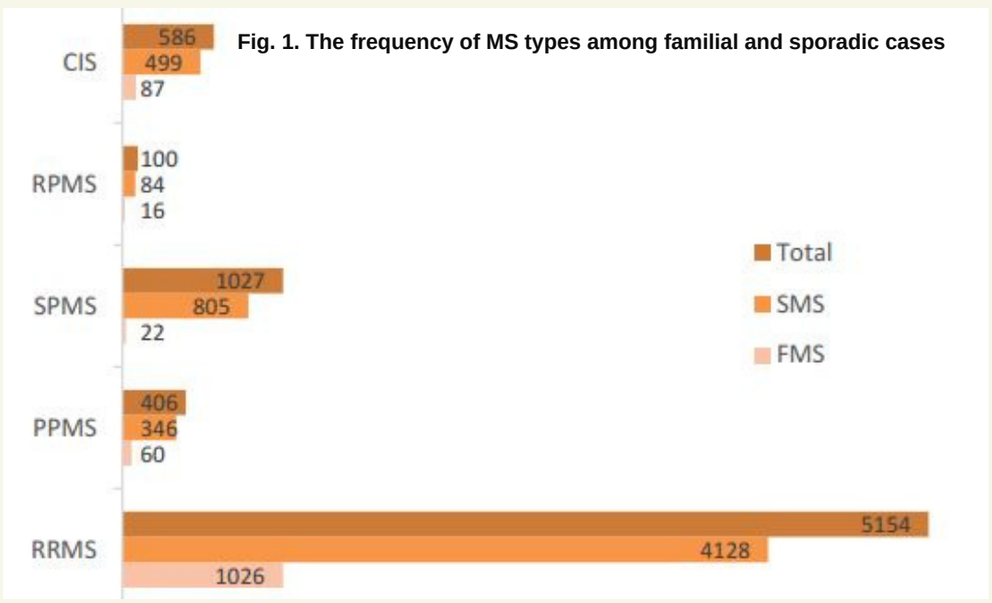
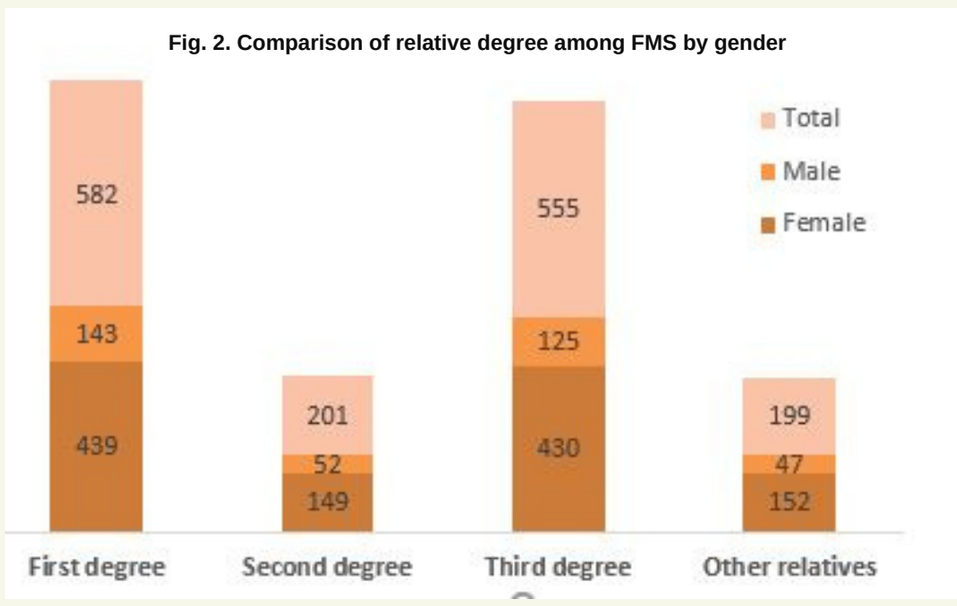


Fig. 1. The frequency of MS types among familial and sporadic cases

Table 2. Comparison of generation, maternal/ paternal and pediatrics familial MS by gender

Variables	Female	Male	Total	P value
Same generation	820 (62.7)	252 (57.0)	1072 (61.3)	0.035
Different generation	321 (24.5)	108 (24.4)	429 (24.5)	0.964
Maternal	373 (28.5)	127 (28.7)	500 (28.6)	0.931
Paternal	326 (24.9)	104 (23.5)	430 (24.6)	0.555
Maternal/Paternal	35 (2.7)	11 (2.5)	46 (2.6)	0.831
Pediatrics	70 (6.1)	31 (8.2)	101 (6.6)	0.174

Fig. 2. Comparison of relative degree among FMS by gender



CONCLUSIONS

- The noteworthy upward trend of FMS in Iran suggests a unique Atlas of FMS prevalence in this multi-ethnic population.
- Despite the higher rate of FMS within Persians, no statistically significant difference was observed among the provinces.
- Undoubtedly, providing better insights regarding the influence of ethnicity and race on familial aggregation of MS demand further investigations.

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