ORIGINAL ARTICLE

Increasing Prevalence of Multiple Sclerosis in Tunisia

Prévalence croissante de la sclérose en plaques en Tunisie

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Abstract

Data on the prevalence of Multiple Sclerosis (MS) in Tunisia come back more than twenty years ago. Our study aimed to determine the prevalence of MS in Tunisia and to discuss the determining factors of its current status. The results suggested a trend towards an increase in the prevalence of MS in Tunisia reaching 58.3 per 100 000 inhabitants in 2020. It ranks Tunisia in a high prevalence MS zone but is still lower than that in the western countries and some MENA countries. The determining factors of this new MS prevalence need to be investigated to insure better management of healthcare resources.

Key words: Epidemiology; Tunisia; North Africa; multiple sclerosis; Prevalence.

Résumé

Les données sur la prévalence de la sclérose en plaques (SEP) en Tunisie remontent à plus de vingt ans. Notre étude visait à déterminer la prévalence de la SEP en Tunisie et à analyser les facteurs déterminants de sa situation actuelle. Les résultats suggèrent une tendance à l'augmentation de la prévalence de la SEP en Tunisie, atteignant 58,3 pour 100 000 habitants en 2020. Ce taux place la Tunisie dans une zone à forte prévalence de la SEP, mais reste inférieur à celui des pays occidentaux et de certains pays de la région du Moyen-Orient-Afrique du nord (MENA). Les facteurs déterminants de cette nouvelle prévalence de la SEP doivent être étudiés afin d'assurer une meilleure gestion des ressources de santé.

Mots-clés: Épidémiologie; Tunisie; Afrique du nord, Sclérose en plaques, prévalence

Introduction

The last update of the Multiple Sclerosis International Federation (MSIF) MS Atlas showed an increase in the worldwide number of people affected with MS reaching 2.8 million in 2020 with a global prevalence of 35.9 per 100,000 people [1]. This prevalence varies widely from 4.79 [4.75, 4.82] in Western Pacific to 142.81 [142.53, 143.08] in European countries. The last study of the epidemiology of MS in the Middle East and North Africa (MENA) region showed an upward trend of prevalence rates in many countries over the last decades [2]. Tunisia is known to belong to moderate-risk areas for MS [3]. However, few studies focused on MS epidemiology in Tunisia and the last data on this topic come back from more than twenty years ago [4]. The present study aimed to assess the current prevalence rate of MS in Tunisia and to discuss the main causes, consequences, and challenges of its status.

Methods

Tunisia is a country located in North Africa with a quite stable population of nearly 12 million in 2022 [5]. Socially insured citizens, but not indigents, receive health care coverage through the National Health Insurance Fund since 2004. In neurology, all socially insured patients diagnosed with MS in the public or the private health sector benefit from an Integral Supported affections regime (ISAR) regardless of the disease's severity or phenotype.

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The ISAR corresponds to chronic and/or serious affections that are supported integrally by the social security for all or a part of health expenses required according to the Tunisian healthcare reglemntations. In table 1, we detailed the distribution according to age of the insured and non insured population in Tunisia by July 1st,2019.

To estimate the total number of Tunisians with MS residing in Tunisia and in the absence of a national information system to identify all cases of MS, we based on the following indicators for the year 2019 [6]:

- The number of patients with MS benefiting from the Integral Supported Affections regime in 2019 (a).
- The number of insured and eligible as of December 31, 2019 (b)
- The Tunisian population estimated on July 1, 2019 (c)

The total number of subjects affected with MS as of December 31, 2019 (d) is calculated according to the following formula: (a) x100% / (b).

The estimation of the 2020 MS prevalence among Tunisian patients with MS residing in Tunisia (MSPTun) was then calculated as follows:

MSPTun (per 100,000 inhabitants) = (d) *100000/(c)

Table 1. Proportional distribution of insured and non-insured Tunisians by July 1st,2019 (%)

	Proportional distribution (%)		
Age (Years)	Population on July 1ST , 2019 (A)	Insured population (B)	Difference (B) - (A)
0-9	18	15	-3
10-19	14	16	2
20-29	15	7	-8
30-39	16	13	-3
40-49	13	14	1
50-59	11	14	2
60+	13	21	8
Total	100	100	-

Results

The proportion of Tunisians insured and eligible is estimated at 53.7% of the whole population and allowed us to extrapolate and estimate the number of patients with MS at the time of the study.

Referring to data from the National Health Insurance Fund, the number of patients with MS benefiting from the ISAR as of December 31, 2019, was 3,649 (a) and the proportion of insured persons and eligible (b).

Thus, the total number of subjects affected with MS as of December 31, 2019 (d) would be of the order of 6,801.

The estimation of MS prevalence in Tunisia (MSPTun) was calculated as follows:

Box 1. MS prevalence in Tunisia

MSP_{Tun} (per 100,000 inhabitants) = 6801*100000/11,658,341

MSP_{Tun} = 58.3 per 100,000 inhabitants

Discussion

The prevalence of MS has significantly increased in Tunisia over the last decades. The first prevalence of MS published in 1976 by Ben HMIDA et al was 3,34 per 100,000 ranking Tunisia in a low prevalence zone [7]. This MS prevalence was based on a tertiary hospital-cohort study from the National Institute of Neurology which drained almost all cases of neurological diseases in the country since its establishment in Tunis in 1974. This first north-African published cohort included 200 Tunisian patients with MS. Then, MS prevalence jumped to 9 per 100,000 in 1985 according to an epidemiological study survey assessing the prevalence of neurological disorders in the city of Kelibia, Tunisia [8]. The following study was a retrospective one including 372 patients with MS followed in the National Institute of Neurology in Tunis between 1974 and 2000. It gave the first MS incidence ratio of 1.3/100 000 inhabitants ranking Tunisia as an area of moderate risk of MS. The concomitant MS prevalence ratio was of 20.1 per 100 000 [3]. Thus, the 2020 MS prevalence ratio is roughly three times that of 2000 [3]. It ranks Tunisia in a high prevalence MS zone as per Kurtzke classification, but it is still much lower than that in the western countries [1]. This increasing prevalence rate is consistent with the prevalence trend in the region [2]. Recent reports from other neighboring countries in the MENA region like Iran, Lebanon, Kuwait, Qatar, and the United Arab Emirates (UAE) showed comparable updated prevalence rates (prevalence rates ranging between 55 and 116 per 100,000 inhabitants) [2] [9,10]. These epidemiological studies were based on different methodologies to evaluate MS prevalence which can be considered as a weakness. Data were extracted from governmental databases, non-governmental national organizations dealing with MS or hospital-based studies. These methodological disparities could influence regional comparisons between MENA countries and with our current Tunisian study. In the Iranian study, prevalence was based on the Iranian MS society data between 1989 and 2016 which could suggest reliability in drawing an epidemiological picture of MS in the entire country [10]. The Lebanese epidemiological study included the governmental third-party payers database [9] and the Emirati prevalence was calculated based on single-center hospital cohorts in Dubai and Abu Dhabi [2].

Moreover, previously published studies on MS prevalence in Tunisia included different cohorts in which MS diagnosis was established according to different MS diagnosis criteria. However, the use of existing data can be justified by the scarcity of epidemiological informations sources of MS in the MENA region and because of the imminent unmet need to draw an epidemiological picture of MS in our latitudes in order to be able to move forward. Nonetheless, it has become clear that MS epidemiology has changed over time in Tunisia as well as in the MENA region following the global trend. This rising prevalence of MS in our country could be explained partly by the availability of more advanced diagnostic tools such as magnetic resonance imaging widespread in all areas in the Tunisian territory. It is also possible that increasing

awareness, either by physicians or patients, could result in the improved diagnosis of cases that previously might have gone unnoticed. Likewise, the use of the 2017 McDonald criteria has proven to be relevant in Tunisians allowing faster and earlier diagnosis [11]. Last, a change in Tunisian lifestyle was noted in the last decades with higher rates of urbanization, high levels of stress in daily life, obesity, smoking, decreased sun exposure, vitamin D deficiency, and improved hygiene. This westernization of the Tunisian lifestyle could explain a significant part of the epidemiological picture of MS in Tunisia. Moreover, it would be relevant in this context to investigate other possible factors like microbiota and recent climate changes in Tunisia. Finally, variations in genetic determinants of MS susceptibility are also suggested leading to possible underlying epigenetic factors.

Patently, our study addressed an important gap in the epidemiology of MS in Tunisia, providing updated prevalence data (58.3 per 100,000 in 2020) that reflects a significant increase over past decades and aligns with global and regional trends. It discussed potential factors contributing to this rising prevalence and highlighted the urgent need of a national MS registry which adds practical value for policymakers.

However, some limitations need to be discussed mainly methodological ones because of the limited epidemiological data about MS patients at a national level. Therefore, we were unable to apply age/sex standardisation to our MS prevalence study due data unavailability. Furthermore, our data were based on the National Health Insurance Fund database, and more specifically on the number of ISARs issued by the year of the study, which constitutes a source of bias. Indeed, the exclusion of indigent patients and those with private insurance or insurance linked to a particular professional sector, such as lawyers and judges, for example could influence the number of MS patients' calculation in Tunisia. Moreover, we were unable to estimate a national incidence rate, as we have no information related on new MS cases over a given period. As a consequence of the lack of incidence data, we are unable to assess the rates of new MS diagnoses and therefore the risk of MS for our Tunisian population.

Conclusions

Findings from the present study are in favor of an increasing trend MS prevalence in Tunisia over the last decades apart from methodological bias. This is in line with the trend in the MENA region and the whole world. These epidemiological changes give rise to an increase in disease burden and should be taken into account in the management and planning of healthcare resources. A generation of MS registry is needed to gather demographic, clinical, and outcome data of patients with MS which is helpful for clinical research and policy makers. Further studies of the epidemiology of MS in Tunisia are needed to assess the incidence of MS, the adjusted prevalence and incidence of MS by gender and age, and the potential risk factors associated with the change of MS risk zone in the Tunisian population.

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