Original Article

Preliminary analysis of month of birth in Iranian/Isfahan patients with multiple sclerosis

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Abstract

Background: Previous publications reported that an individual's month of birth (MOB) might have an important correlation to that consequent risk of multiple sclerosis (MS).

Aim: The aim of this preliminary study was to investigate the distribution of different MOBs inpatients with MS in Isfahan, Iran.

Materials and Methods: This investigation was conducted to the Isfahan Neurosciences Research Centre. 1283 patients with MS were studied. Clinical data were recorded in d-Base and analyzed using SPSS (version 18) for Windows.

Results: Of the total population studied there were 979 females and 304 males. The mean age of all the patients was 34.6 years (range 10-87 years). Within the total population, the MOBs in the 62% of patients were in the season's spring and summer, and in 38% of patients they were in the season's autumn and winter. As the MOB might be recognized to have a bearing on an individual's risk of contracting MS, the highest and lowest correlations seem to be linked with April, September, May ($\uparrow$), and November ($\downarrow$), respectively.

Conclusions: The seasonal relationship between MOBs and MS risk might be pointed toward a potential function for vitamin D throughout pregnancy or the early life of the newborn. Further studies are needed to confirm these correlations.

Key Words: Iranian population, month of birth, multiple sclerosis, spring

INTRODUCTION

Multiple sclerosis (MS) is a recurrent tentative disease of the central nervous system (CNS) that typically follows a deteriorating course, with accumulation of plaques associated with the demyelination of axons and the loss of oligodendrocytes. It is hypothesized that the loss of axons is the main mechanism underlying progressive disability. Escalating data suggest there are two main types of risk factors for MS, genetic and environmental, likely with complex interactions between them and effects that may be harmful or protective, depending on the patient.[1-3]

Month of birth (MOB) has formerly been expressed as a risk question for MS. Torkildsen *et al.*, presented an update regarding the MOB as a risk factor for

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MS. The outcome appears to be mainly important in high-risk regions for the disease, particularly in districts with low sunlight exposure. No MOB effects or insignificant correlation in districts with high sunshine exposure have been reported.[4] Disanto *et al.*, documented that the risk of different immune-mediated diseases in the UK might be considerably prejudiced by the season of birth, suggesting the effect of gestational ultraviolet B and vitamin D exposure.[5] The association of spring birth with the risk of MS has been confirmed by Saastamoinen *et al.*[6] Studies related to the association between MOB and MS incidence in Southern Iran recognized that the outcomes are comparable to those detailed by many earlier studies.[7] It has also been documented that in the nonexistence of sufficient control for confusing features such as year and place of birth, the previous report for the involvement of MS with MOB might possibly include false positives.[8] Regarding Latin America and Portugal, a recent study showed the nonexistence of a seasonality model relating the risk of MS to MOB.[9] Another study related the risk of MS in different latitudes of South America to MOB showed that MS patients born to mothers who were pregnant at different southern latitudes do not follow the seasonal pattern observed at higher northern latitudes.[10] The Isfahan MS Society (IMSS) reported a period prevalence of 73.3/100,000 between April 2003 and July 2010, and an incidence rate of 9.1/100,000 in the year 2009. A recent study confirmed a prevalence of 93.6for Isfahan, Iran.[11-14] The aim of this study was to investigate the distribution of MOB in patients with MS in Isfahan, Iran.

MATERIALS AND METHODS

A retrospective study was performed on 1283 patients with MS, those attended MS clinic located at the Isfahan Kashani Hospital. The study was conducted to the Isfahan Neurosciences Research Centre (INRC). Demographic and clinical data together with the date of birth including MOB, gender, and age were recorded in d-Base. The statistical analysis of the data was performed using SPSS (version 18) for Windows.

RESULTS

Figure 1 shows that 76% of the total population studied were females (n = 979) and 24% were males (n = 304). The mean age of all patients was 34.6 years (range10-87 years). Figure 2 shows that the age of 87% of patients ranged 20-49 years. Figure 3 shows the distribution of patients according to MOBs. The highest and lowest associations could be linked to April and November, respectively. The MOBs in 62%

(n = 609) of patients were in spring-summer and in 38% (n = 370) were in autumn-winter.

A further analysis related to gender showed that in the male population (n = 304), the MOBs in 59% were in spring-summer and in 41% (n = 124) were in autumn-winter [Figure 4].

The mean age of male patients was 36.9 years (range 14-85 years). The mean age of females was 33.9 years (range 10-87 years). In the females the highest population of MS (62%) was linked to spring-summer as follows: September (n = 137), April (n = 127), and May (n = 125).
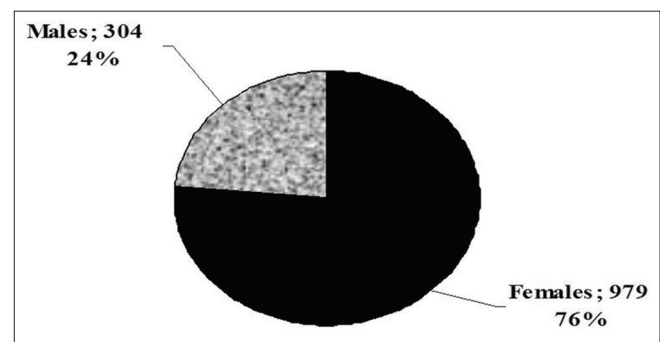

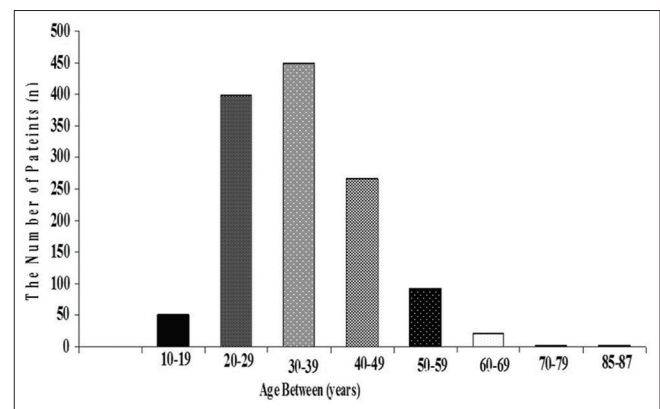**Figure 1:** Fraction of gender in population studied (n=1283)

Figure 2: Distribution of age in population studied (n=1283)
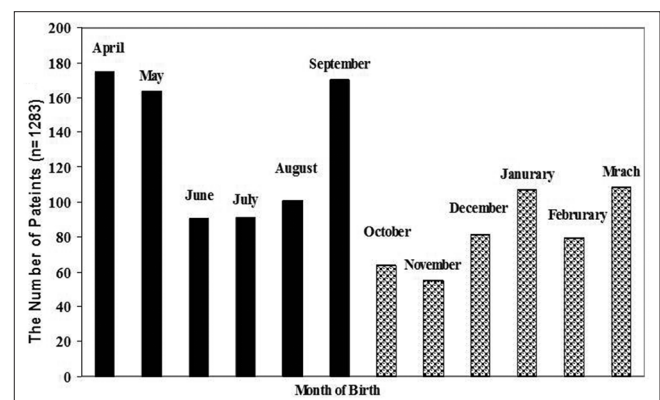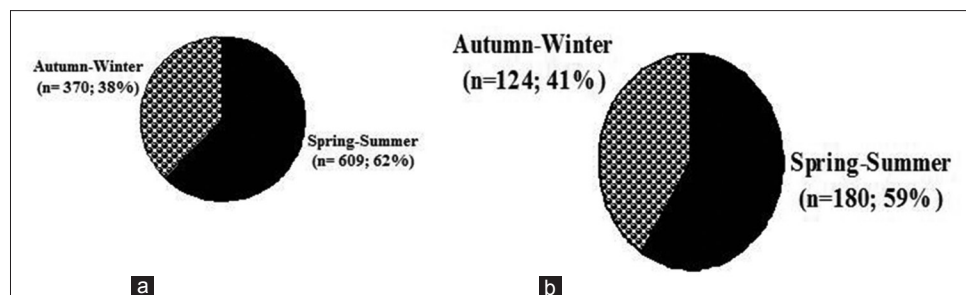

Figure 3: Distribution of patients according to month of birth

Figure 4: Distribution of (a) females and (b) males according to their month of birth

DISCUSSION

The result of this preliminary analysis of MOB in patients with MS in Isfahan, Iran is in agreement with previous publications,[7,15] as the MOB with the highest population of MS was ranked in spring months such as April and May. Previous publications reported that Isfahan could be considered as an area with a medium to high risk of MS.[3,11-14] Furthermore, the results of this survey also supported that the highest rate of patient population could be linked to the age group of 20-39 (67%), followed by 30-39 (36%), and 40-49 (22%) years. This is in agreement with earlier publications that reported an increasing incidence of MS within the younger population, which results in a major economic burden on the patient, their family, the health system, and society.[16-19]

In the present study, the MOBs in 62% of patients were in September, April, and May. Numerous investigations have pointed toward MOBs as an indicator of the risk feature for MS susceptibility and disease progression. Previous publication reported also a higher risk of MS for those born in April (ratio 1.07, $P = 0.002$) and May (ratio 1.11, $P = 0.0006$), and a lower risk for those born in October (ratio 0.94, $P = 0.004$) and November (ratio 0.88, $P = 0.0002$).[15] The seasonal association between MOB and the risk of MS might be explained by the relationship between geographic latitude and risk, as the effect appears to be most important in high-risk regions, particularly in regions with low ultraviolet light exposure and low maternal vitamin D levels. Exposure to sunlight during pregnancy or early childhood might be associated with the risk of MS, as low exposure could mean a lower amount of vitamin D.[20-22] Finally, in order to move further toward the prediction of: (1) Prevention aspects in the first important step (2) therapeutic and pharmacotherapy management in the second step additional advance studies, to analyze many features from maternity to maturity and the environmental geographies that are coupled with susceptibility to MS are recommended in Isfahan, Iran.

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