

Multiple sclerosis in the Southern and Northern hemispheres: the month of birth at different latitudes has the same influence on the prevalence and progression of the disease in the Northern and Southern hemispheres?

Esclerose múltipla nos hemisférios sul e norte: o mês de nascimento em diferentes latitudes influencia, de igual modo, a prevalência e progressão da doença nos hemisférios norte e sul?

Maria Lucia Vellutini Pimentel

Head of Clinic, Neurology
Outpatient Clinic, Santa Casa da
Misericórdia do Rio de Janeiro,
Rio de Janeiro RJ, Brazil.

Correspondence

Maria Lucia Vellutini Pimentel
Rua Santa Luzia 206, Centro
24^a / 25^a Enfermarias
20020-022 Rio de Janeiro RJ - Brasil
E-mail: mlvpimentel@gmail.com

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The etiopathogenesis of multiple sclerosis (MS) remains unclear in spite of the several attempts to predict the risk of acquiring the disease. Genetic and environmental factors related to disease susceptibility, suggested by many recent studies that configured a multifactorial etiology to MS, reflect its geographical distribution and changes in risk with migration. The incidence of MS seems to decrease with migration in early life, from high-risk to low-risk areas^{1,2}. It's already known that specific haplotypes represent a genetic risk factor for MS. Exposure to sunlight and production of vitamin D appear to be important factors for MS susceptibility. Vitamin D seems to promote Th2 function and to inhibit the proinflammatory cytokines IL-1 α , IL 2 β and TNF α . Its role in immunological response was the focus of many studies concerning autoimmune diseases, including MS³. Vitamin D was also identified as a promoter of some alleles related to the month of birth and risk of MS⁴.

According to latitude, Kurtzke⁵ and Bharanidharan⁶ stratified the prevalence of MS in three groups, and the Northern parts of Europe and North America presented high range (>30/100,000), Southern Europe and USA had medium range (5–30/100,000), South America presented low to medium range and Asia had low range (<5/100,000 inhabitants). Many studies suggested that less exposure to sunlight in high latitudes increased the risk of MS¹. Several countries in the Northern hemisphere analyzed the mother's exposure to sunlight during pregnancy, the month of birth and the risk of developing MS, and found a higher number of MS patients born in winter time and in higher latitude regions^{7,8}. Conversely, recent studies have not found a significant variation in the prevalence of MS with the latitude in Latin America. Risco et al.⁹ considered specific environmental factors and different ethnicity also as being related to the lower influence of latitude in the prevalence of MS in Latin America, compared to Europe and North America.

In this issue of *Arquivos de Neuro-Psiquiatria*, Fragoso YD et al.¹⁰ published the first study to evaluate the risk of MS according to latitude and month of birth, which included many different regions in the same continent. The authors analyzed 1,207 MS patients and 1,207 controls in four countries of South America: Argentina, Brazil, Chile and Peru, and compared the month of birth in a large range of latitudes (zero to 10° South; 11° to 20° South; 21° to 30° South; and 31° to 40° South) and the prevalence of MS. In spite of the relatively low number of patients due to the lower prevalence of MS in the Southern hemisphere compared to the Northern hemisphere, children born in high latitudes in the Southern hemisphere did not present higher incidence of MS in adult life. There is not a major variation of exposure to daylight between different seasons in the Southern hemisphere as there is in the Northern

hemisphere. Therefore, the prevalence of MS in individuals born in the Southern hemisphere during winter time is not higher than that seen in other seasons.

In addition to exposure to sunlight, the authors also emphasized other factors regarding the risk of developing MS in the Southern hemisphere, such as mother's food intake and nutritional status, exposure to helminths and other parasites.

The results of this study emphasize the multifaceted aspects of MS according to different regions in different countries. The aspects of MS are diverse in the Northern and the Southern hemispheres. Therefore, it is crucial to exchange data of each continent among MS specialists in the world in order to better understand the etiopathogenesis of MS.

References

1. Beretich BD, Beretich TM. Explaining multiple sclerosis prevalence by ultraviolet exposure: a geospatial analysis. *Mult Scler* 2009;15:891-898.
2. Kurtzke JF, Beebe GW, Norman JE Jr. Epidemiology of multiple sclerosis in US veterans: III. Migration and the risk of MS. *Neurology* 1985;35:672-678.
3. Barušić AC, Bach I, Adamec I, Habek M. Multiple sclerosis: from genes to environment. *Lat Amer Mult Scler J* 2012;1:90-100.
4. Saastamoinen KP, Auvinen MK, Tienari PJ. Month of birth is associated with multiple sclerosis but not with HLA-DR15 in Finland. *Mult Scler* 2012;18:563-568
5. Kurtzke JF. A reassessment of the distribution of multiple sclerosis. Part one. *Acta Neurol Scand* 1975;51:110-136.
6. Bharanidharan P. Monthly distribution of multiple sclerosis patients' births. *Int J Biometeorol* 1997;40:117-118.
7. Salemi G, Ragonese P, Aridon P, et al. Is season of birth associated with multiple sclerosis? *Acta Neurol Scand* 2000;101:381-383
8. Salzer J, Svenningsson A, Sundström P. Season of birth and multiple sclerosis in Sweden. *Acta Neurol Scand* 2010;122:70-73.
9. Risco J, Maldonado H, Luna L, et al. Latitudinal prevalence gradient of multiple sclerosis in Latin America. *Mult Scler* 2011;17:1055-1059.
10. Fragoso YD, Adoni T, Agüero FB, et al. Multiple sclerosis in South America: month of birth in different latitudes does not seem to interfere with the prevalence or progression of the disease. *Arq Neuropsiquiatr* 2013;71:573-579.