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Place of birth, age of immigration, and disability in Hispanics with multiple sclerosis



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Abstract

Background: Hispanics in the US are a diverse community where their knowledge and risk for developing disability in multiple sclerosis (MS) may relate to their level of acculturation.

Objective: To compare the risk of disability in Hispanics with MS in the US by place of birth and age of immigration.

Methods: We conducted a cross-sectional study of 304 Hispanics with MS residing in Southern California. Place of birth and age of immigration were used as proxies to acculturation. Individuals were classified as US-born, early and late-immigrant (<15 and ≥15 years at immigration to the US, respectively). Risk of disability (expanded disability status scale ≥6) was adjusted for age at symptom onset, sex, socioeconomic status, and disease duration, using logistic regression.

Results: Late-immigrants were older at symptom onset (34.2 ± 11.9 vs. 31.9 ± 12.9 vs. 28.5 ± 9.7 years, $p < 0.001$) and had more disability (28% vs. 9% vs. 18%, $p = 0.04$) compared to early-immigrant and US-born respectively. There was no difference between groups by female sex, type of MS, ethnicity, chronic medical conditions, and disease duration while differences were noted by socioeconomic status. Being late-immigrant was independently associated with increased disability (adjusted OR 2.3 95% CIs 1.07–4.82; $p = 0.03$) compared to US-born.

Conclusion: Later immigration to the US in Hispanics with MS is associated with greater disability. These findings may reflect differences in social, environmental and cultural factors

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that may act as barriers for accessibility and utilization of health services. An in-depth assessment of the perceptions and attitudes about MS are warranted in this population.
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1. Introduction

Migration patterns and age at migration are reported to primarily influence multiple sclerosis (MS) disease susceptibility (Dean and Kurtzke, 1971; McLeod et al., 2011, 2012), and age of onset (Elia et al., 1990; Amezcua et al., 2011). Recently, increased disease severity has been reported among non-European immigrants to Norway, France, and United Kingdom compared with natives, despite similar access to health care and biological markers in some (Berg-Hansen et al., 2013; Debouverie et al., 2007; Elia et al., 1990). While biological differences could be responsible, immigration can come at the expense of health concerns and proper care that could be playing a role in MS disease progression.

Hispanics in the United States (US) represent a complex population of US-born and foreign-born immigrants (The Hispanic Population in the United States, 2012), where immigration patterns have been noted to be influential in chronic inflammatory diseases (Torres and Wallace, 2013). Data indicate that these changing patterns among Hispanics may be related to acculturation, the process of cultural and psychological change that results following meeting between cultures (Lara et al., 2005). Obesity, Type 2 diabetes risk, smoking, and cardiovascular disease in Hispanics are often observed more often with higher acculturated Hispanics paralleling their age of immigration or time in the US (Delavari et al., 2013; Nokes et al., 2013; Fu et al., 2007; Bates et al., 2008). On the other hand less acculturated Hispanics are reported to eat healthier foods, but yet experience more barriers to healthcare and are less likely to seek preventive services (Argeseanu Cunningham et al., 2008; Neuhaus et al., 2004). Thus, it is possible that acculturation could influence MS disease progression among Hispanics living in the US. To investigate this notion further, we compared Hispanics that were US born, immigrated early and later to the US, and assessed the relationship between birth place and age of immigration, as a proxies to acculturation, on MS disability in order to unravel social determinants of health that may provide targets for intervention.

2. Methods

2.1. Study population

Data for this cross-sectional study was extracted from the Hispanic MS Registry at the University of Southern California (USC) MS clinics (Amezcua et al., 2011). The MS clinics include the MS Comprehensive Care center where private payer individuals are seen and the publicly funded specialty MS clinic at the Los Angeles County medical center serving uninsured/underinsured individuals; both of which are

served by the same MS specialist neurologists. Clinical and demographic information were collected from participants with MS (Polman et al., 2011) between October 2008 and September 2013. Initial Hispanic self-identification was collected along with identification of country of origin, and later verified by a comprehensive, self-administered questionnaire. A neurological history, exam and an expanded disability status scale (EDSS) (Kurtzke, 1983) was conducted and assigned by an MS specialist. Hispanic ancestral background dating back to grandparent origin was completed for 99% of participants. The Institutional Review Board at USC approved this study and all patients provided informed consent prior to participation.

2.2. Clinical characteristics

Clinical MS characteristics such as type of MS, date of first symptom, diagnosis, on treatment, clinic setting, and chronic medical conditions were extracted from the medical record system and registry database. Because individuals of low income (<40,000/year) are more likely to be under-insured or uninsured individuals, receiving treatment at the county clinic was used as a marker of socioeconomic status. Chronic inflammatory medical conditions were also collected using a standardized questionnaire at the time of entry to the registry and were classified as cancers, autoimmune conditions and vascular risk factors. Vascular risk factors included diabetes mellitus, hypertension, stroke, coronary artery disease, and hypercholesterolemia. Information on smoking was also included. An EDSS of less than 6.0 was used to indicate individuals that were still ambulating without assistance. Cases were thereby divided as having an EDSS <6.0, while those using constant support of a cane, walker, or wheelchair were appointed an EDSS of ≥ 6.0 . Reaching an EDSS score of 6.0 was considered a clinical endpoint of severe disability.

2.3. Birth and immigration

Information regarding immigration history and place of birth were obtained and served as indexes of acculturation. Detailed immigration history, including place of birth, year and age of immigration, was also recorded using structured, in-person interviews at registry entry. To address the possible effects of immigration on disability, we categorized patients into three groups according to time of immigration: late-immigrants were those who immigrated to the US after age 15 ($n=67$) and immigrants to the US before age 15 was termed early-immigrants, and compared them to those who were born in the United States (US-Born). We chose 15 years as this has been previously reported to be a critical age of migration for MS (McLeod et al., 2011).

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