Increased incidence and prevalence of psoriasis in multiple sclerosis

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ARTICLE INFO

Keywords:
Multiple sclerosis
Psoriasis
Incidence
Prevalence
Validation

ABSTRACT

Background: Psoriasis and multiple sclerosis (MS) share some risk factors, and fumarates are effective disease-modifying therapies for both psoriasis and MS, suggesting a common pathogenesis. However, findings regarding the occurrence of psoriasis in the MS population are inconsistent. Objectives: We aimed to estimate the incidence and prevalence of psoriasis in the MS population versus a matched cohort from the general population. Methods: We used population-based administrative data from the Canadian province of Manitoba to identify 4911 persons with MS and 23,274 age-, sex- and geographically-matched controls aged 20 years and older. We developed case definitions for psoriasis using ICD-9/10 codes and prescription claims. These case definitions were compared to self-reported psoriasis diagnoses. The preferred definition was applied to estimate the incidence and prevalence of psoriasis over the period 1998–2008. We used multivariable Cox regression to estimate the risk of psoriasis in the MS population at the individual level, adjusting for sex, age at the index date, socioeconomic status and physician visits. Results: In 2008, the crude incidence of psoriasis per 100,000 person-years was 466.7 (95%CI: 266.8–758.0) in the MS population, and 221.3 in the matched population (95%CI: 158.1–301.4). The crude prevalence of psoriasis per 100,000 persons was 4666.1 (95%CI: 3985.2–5429.9) in the MS population, and 3313.5 (95%CI: 3057.4–3585.3) in the matched population. The incidence and prevalence of psoriasis rose slightly over time. After adjusting for sex, age at the index date, socioeconomic status and physician visits, the risk of incident psoriasis was 54% higher in the MS population (HR 1.54; 95%CI: 1.07–2.24). Conclusion: Psoriasis incidence and prevalence are higher in the MS population than in the matched population.

1. Introduction

The etiology of multiple sclerosis (MS) remains unknown but insight may be gained by studying comorbidities that occur with different frequency than expected in MS as compared to the general population. In this regard, immune-mediated disorders have been of particular interest. Psoriasis is an immune-mediated skin disorder characterized by scaly erythematous plaques. It is common in the general population with prevalence estimates ranging from 0.9% to 8.5% in adults depending on the region, and like MS, the prevalence appears to increase with increasing distance from the equator.(Parisi, Symmons et al., 2013) Psoriasis and MS share risk factors,(Setty, Curhan et al., 2007; Cotsapas, Voight et al., 2011; Handel, Williamson et al., 2011; Hedstrom, Olsson et al., 2012; Armstrong, Harskamp et al., 2014) and fumarates are effective disease-modifying therapies for both psoriasis and MS,(Gold, Kappos et al., 2012) suggesting a common pathogenesis.

Findings regarding the occurrence of psoriasis in the MS population are inconsistent, with the estimated incidence of psoriasis ranging from 0.17% to 1.63% while the estimated prevalence ranges from 0.39% to 7.74%.(Marrie, Reider et al., 2014) However, few prior studies were population-based, and most were conducted in Europe. Whether psoriasis occurs more often than expected in those with MS remains uncertain.(Marrie, Reider et al., 2014) One Danish study found the
incidence of psoriasis to be non-significantly higher in the MS population than expected for the general population.\cite{Nielsen, Frisch et al., 2008} One European study also found the prevalence of psoriasis to be higher than expected in the MS population based on the literature for the general population, but five other studies have reported no difference in prevalence.\cite{Marrie, Reider et al. 2014}

Therefore, we developed and validated an administrative case definition for psoriasis and determined the incidence and prevalence of psoriasis in the MS population as compared to a matched cohort drawn from the general population.

2. Materials and methods

2.1. Setting

We conducted this population-based study in the Canadian province of Manitoba.

2.2. Administrative data

Manitoba Health delivers publicly funded health services to nearly all provincial residents, and maintains electronic records of those health services. Since 1984, each health service encounter includes a unique personal health identification number (PHIN) identifying who received the service. We linked the anonymized versions of the population registry, hospital Discharge Abstract Database (DAD), physician claims and Drug Program Information Network (DPIN) datasets via scrambled PHIN (to protect confidentiality). The population registry captures demographic information (dates of birth and death, sex, postal code) and dates of insurance coverage. Hospital abstract registries include admission and discharge dates, and up to 25 discharge diagnoses recorded using the International Classification of Disease (ICD)-9-CM or ICD-10-CA codes, depending on the year. Physician claims include the date of service, and one diagnosis, recorded using a three-digit ICD-9-CM code. The DPIN has captured the date of dispensation, drug name and identification number (DIN) for all outpatient prescriptions dispensed to Manitoba residents since 1996. Except for prescription claims, administrative data were available from 1984 to 2011.

2.3. Study populations

First, we identified all persons with MS in Manitoba who met a validated administrative case definition for MS \cite{Marrie, Yu et al., 2010} between 1984 and 2011, and assigned the date of their first claim for demyelinating disease as the date of MS diagnosis (index date). Next, we identified a matched cohort from the general population by excluding individuals with any diagnostic codes for demyelinating disease as the date of MS diagnosis,\cite{Chang, Chen et al., 2009; Seminara, Abuabara et al., 2011; Asgari, Wu et al., 2013; Lofvendahl, Theander et al., 2014}. We used a 2-year run-in period preceding the first incident case could only be identified from 1998 onwards. Incidence may artificially drop at the end of a study period when there is insufficient time to meet the case definition. Thus, to reduce the likelihood of artefactual temporal trends we limited our reporting of incidence and prevalence to the 10-year period, 1998–2008.

Incidence and prevalence estimates were age-standardized to the 2001 Canadian population, the census population closest to the study mid-point. Age-specific average annual incidence was reported using age groups 20–44, 45–59, and ≥ 60 years, to ensure adequate cell sizes to protect participant confidentiality and for consistency with prior work regarding the burden of comorbidity in MS.\cite{Marrie, Fisk et al., 2015} Sex-specific estimates were also reported. We report 95% confidence intervals (CI) for each parameter based on the binomial distribution. We compared age-standardized incidence and prevalence estimates between groups using negative binomial regression, to account for overdispersion, adjusting for year. We report incidence rate ratios (IRR), prevalence ratios (PR) and the corresponding 95%
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