Migraine is comorbid with multiple sclerosis in Nationwide Inpatient Sample
A retrospective review of Nationwide Inpatient Sample for the year 2007
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Introduction

Migraine frequently occurs in individuals with multiple sclerosis (MS). The association of migraine with MS was first reported by McKibban. He reported that 2% of MS patients had experienced migraine within 3 months of MS onset. Headache is not a common symptom of MS but this association had been reported in several small case-control studies. The lifetime prevalence of headache in MS was reported to be in the range of 40-50%. The prevalence of migraine in women with MS was higher than non-cases. Women with migraine had a higher relative risk of developing MS than non-migraineurs. Migraine was found to be around risk factors for MS in some studies 3-5. Migraine is three times more common in MS clinic patients than in the general population according to a clinic-based case control study. MS patients with migraine were more symptomatic compared to a control group 7. Two case control studies reported the association of migraine with MS before the ICHD-2 classification of migraine 8. Several studies that followed reported higher prevalence of headache in MS populations 9-11. Migraine was a predominant headache type among interferon treated MS patients and tension type headache more prevalent among MS patients who were not treated with interferon 12. Migraine was reported to be a comorbidity in a central demyelinating disease like MS in about 92%. A case control study reported the incidence of migraine in MS patients as 27% compared to 12% in the control group. MS patients with migraine had poorer quality of life compared to controls and treating migraine in MS might contribute to improve their quality of life 13.

Objectives

To estimate the prevalence and association of migraine in hospitalized MS patients using the 2007 Nationwide Inpatient Sample (NIS) data.

Methods

Healthcare Cost and Utilization Project (HCUP) is a healthcare database developed through the federal-state industry partnership sponsored by the Agency for Healthcare Research and Quality (AHRQ). Nationwide Inpatient Sample (NIS) is one of the several HCUP databases. It is the largest all-payer inpatient care database, publicly available in the US and contains data from 50 million hospital stays from >1000 hospitals. The advantages of using the NIS data include: 1) Large sample size, 2) Detailed analyses of cases, and 3) Special patient populations, such as the uninsured. 2) Hospital and discharge weights are provided for producing national estimates. 3) Data can be linked to the hospital level (based on State regulations on the release of identifiers).

Data were obtained from 40 states within the United States that contributed to the 2007 NIS. Patients of age ≥18 years with a primary MS diagnosis and secondary migraine diagnosis were queried using the international classification of disease - clinical modification ninth edition (ICD-9) codes. All MS primary diagnoses were identified as causes. Controls included queried migraine diagnoses excluding MS primary cases and MS like conditions. MS like conditions included theories of mitochondrial metabolism. Behco's syndrome, vasculitis, Friedreich's ataxia, adrenoleukodystrophy. Disease, encephalitis, synergymeglia, sarcoidosis, cervical spondylosis, brain tumors, other brain tumors, lupus, arteriovenous malformation, subacute combined degeneration, sarcoidositis, viatinan B12 deficiency, Lyme disease, and cerebrospinal fluid input variables included: secondary migraine diagnoses, age, race, gender, and region. Covariates included: hypertension, diabetes, obesity, smoking, and alcohol. The analysis included multivariate logistic regression using SAS survey procedures adjusting for age, race, gender, region, and covariates.

Results

Among 6,336,785 discharges from 1,044 hospitals, 0.07% had a primary diagnosis of MS. The mean age was 57 years. 3,002 of the MS discharges were female and of these, 1,406 were Caucasian. The prevalence of migraine among the cases was 7%. Among all MS discharges and all discharge diagnoses the prevalence of migraine was 3% and 1.2% respectively. The distribution of other common comorbidity conditions among primary MS discharges included smoking 1%, alcoholism 1.7%, drug abuse 3.3%, hypertension 10%, diabetes 10% and obesity 7%. The increased tendency of migraine to co-exist with MS (adjusted odds ratio: 2.28, 95% CI: 1.89 - 2.74) was statistically significant (p < 0.001).

Conclusions

Migraine is twice as frequent among MS cases compared to controls. The study represents a large, uniform sample across the entire United States. The migraine prevalence rates are consistent with prior published studies. The sample size and lack of information regarding migraine diagnostic criteria used. The major advantage that it provides nationwide estimate of migraine prevalence in MS.