The Gulf War Era MS Cohort: Clinical Features at First Diagnosis

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Abstract

Background: Predicting the initial course in an individual patient with MS is difficult. There are few contemporary cohorts that allow one to understand specific sex and racial differences. Objective: To characterize the clinical features at first diagnosis for a nationwide incident cohort of multiple sclerosis (MS), the US military forces of the Gulf War era. Methods: For all cases of MS with first diagnosis in or after 1990 who served on active duty between 1990-2007 and who were screened and followed by the Department of Veteran Affairs (VA), medical records and databases from the US military were used for demographic and clinical variables abstracted. Neurologic worsening was measured with the Kurtzke Functional Systems and Disability Status Scale (DSS). Results: MS/DSS criteria were met for a total of 2,298 definite and 196 possible MS. The gender ratio distribution for the 2,474 among the major groups were: white, 1,196 male and 527 female; black, 386 male and 274 female; Hispanics, 98 male and 56 female; other race, 21 male and 24 female. The proportion with involvement of specific Functional Systems affected at first diagnosis were: Pyramidal, 67%; Cerebellar, 53%; Brain Stem, 40%; Sensory, 30%; Bowel/Bladder, 27%; Visual, 16%; Cerebral, 21%; Other, 3%; Mean and median DSS scores at diagnosis were: for white males and females 3.8 and 2.7, 3.5 and 2.3, 3.6; for black males and females 3.9, 3.4 and 2.6; 3.5 and 2.3; 3.9 and 3.3. 3.5. Conclusions: The findings from this study are similar to other recent studies of MS, where incidence rates by race, sex, and service were presented, indicating that the comparatively higher percentage of military veterans is a clinically similar to other recently published. Additional analyses are under way to further clarify the composition and cause, as well as to provide more detailed demographic analyses.

Introduction:

The symptoms and signs of multiple sclerosis (MS) are variable and the course of the disease is often difficult to predict. Relatively few have its known cause, however, larger population-based cohorts, progression of disease has been shown to be relatively independent of age. Some patients develop severe disability and death within 10 years with others having a relatively benign course.1-4 Several case series have been published describing the pattern of deficits at various stages of MS.5-8 Risk factors in the MS disease have been demonstrated by several groups.5-8,9,10 These reports are subject to the limitations of the population that has been chosen and also to errors in the retrospective nature of reporting information. For example, hospital- and referral-based centers often select for the more severe cases of MS that may not include patients with a more benign course. Also, information may be collected from patients that are not recently diagnosed and that are not those who present with acute symptoms, are relatively mild and with no referral from hospital. The effectiveness of collaborations of clinical organizations is the lack of data from patients that are no longer under care. When gathering information directly from patients, the memory of early events is often false and when validated with medical records. Nonetheless, population-based cohorts with careful case ascertainment and data collection provide the best information on disease morbidity.11-13 The US military MS cohorts have provided a rich resource for the evaluation of the epidemiology of MS for this past century. We have assembled a contemporary MS cohort from the Gulf War Era (GW) that is representative of the demographically diverse military population and have recently described the incidence of this disorder.14 These reports outline the baseline MS morbidity associated with the Gulf War era.

Methods:

The GW Era MS cohort was assembled similarly to the WMF (2)2 and the Vietnam and later years.15 With the assistance of the Veterans Affairs Administration, Department of Veteran Affairs (VA) databases and Department of Defense (DoD) data, we identified all veterans who had applied and were evaluated for a service connection (MS) onset during active-duty military or years thereafter for MS by the VA, and who had active-duty service between 1989 and 2007. The Compensation and Pension (C&P) file contains initial and ongoing demographic and medical data for all service-connected veterans. With supervision by the study neurologists, all cases were reviewed by trained researchers and relevant demographic, clinical and environmental exposures were obtained. The study was approved by the Institutional Review Board. The diagnosis was confirmed in one of the study neurologists. The clinical and/or radiological criteria were used to confirm the diagnosis. The Demographics and the disability status scales of multiple sclerosis, possible multiple sclerosis, CIS and MSMS were used as cases of multiple sclerosis. The military diagnostic examination or civilian neurological examination after the first onset symptoms was coded and scored according to the Kurtzke Disability Status Scale (DSS). The most recent neurological examination in the veteran's record was also scored with the DSS. The DSS Functional System categories were used to code neurological signs at onset and first diagnoses in this cohort. Standard statistical techniques to evaluate categorical and central data were used in the analysis.

Results:

After our case review, we identified a total of 3,494 military veterans who had active duty service during the Gulf War Era from 1990 to 2007, and who had applied for service connection for MS or CIS. We determined that 351 (10.1%) did not have MS based on the McDonald criteria and 243 (7.1%) had a diagnosis of MS before 1990. The remaining 2,691 comprise our cohort, with the distribution of specific diagnoses by race presented in Table 1.

The type of neurological symptoms at first diagnosis were analyzed by sex in Figure 1 and by racial groups in Figure 2. The onset symptoms were necessary to report to department of MS on active duty or within 7 years thereafter for service connection. The multiple symptom category was the most common comprising 30% or more of the presentations. The major take of the MS cases were White (33%) and Black (16%). Overall, there were no significant differences in the individual symptoms by sex in race (Table 3). Figure 3 and Figure 4 show DSS scores by sex and race at the diagnostic evaluation, respectively. The mean DSS at onset was 2.9 ± 1.8. The proportion of all patients with disability scores was 2.5 to 4.5. Disability scores were 5.2 and 6.4 for men and 2.5 and 4.0 for women. The diagnostic neurologic examination after onset was conducted in 22% of cases (4.7%). The mean DSS scores of MS patients were scored by sex and race with high DSS scores. These findings were significantly different as shown in Table 2.

Discussion:

This analysis reviews the cross-sectional clinical morbidity of MS at the earliest available time point for the recently assembled GW Era MS cohort. This cohort is the most medically diverse incident cohort of MS populated to date. The data we analyzed was unusually comprehensive compared with most MS series. This is in part because widespread of the actual symptoms of MS are for service connection in the military and must be documented and entered into a neurological examination and rating based. While there is individual heterogeneity in symptoms at onset and diagnosis, this does not appear to be a significant demographic or clinical pattern among or between racial groups. The pattern of MS at onset and diagnosis in African Americans and Hispanics was similar to the white. There is a significant increase in proportion of MS in DSS to MS or MSMS as Black have other diagnoses.16,17 In this report we have added new data for European ancestry in the proportion of diagnoses of MS. This suggests that may be, racial differences found in the proportion of people who present with diagnosis of MS in general, that may be due to variations in the clinical profile of MS. At the time of diagnosis, weights, heights, and body mass index of the cohort were measured and compared with military records, but there were no major differences that could be established between groups. The data was also collected on the frequency and severity of infection in each of the neurologic functional systems to increase with increasing severity of the DSS. This data on onset at onset and provides a window on MS morbidity in men, women of multiple races within the US. We plan on further analysis of this cohort to evaluate factors for onset and progression. Support for this manuscript was provided by VA Merit Review (DEP-302-011) and in part by National Multiple Sclerosis Society Small Grant (PIR-1003) and the Multiple Sclerosis Center of Excellence-East.

References