Neuromyelitis Optica Spectrum Disorder in Active Duty Service Members

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Neuromyelitis Optica Spectrum Disorder (NMOSD) is an auto-inflammatory disorder that may be associated with autoantibodies against aquaporin-4 (AQP4). This study aimed to characterize patients with NMOSD in the Department of Defense (DoD) population.

**Objective**
To characterize patients with neuromyelitis optica spectrum disorder (NMOSD) in the Department of Defense (DoD) population.

**Background**
- NMOSD is an auto-inflammatory disorder with associated serum autoantibodies to aquaporin 4
- NMOSD preferentially involves the optic nerves, spinal cord, and circumventricular organs
- NMOSD is associated with additional comorbid autoimmunity
- The incidence of NMOSD among military personnel is unknown; the overlap of NMOSD with other autoimmune conditions has not been defined in this population.

**Design and Methods**
- Approved U of Utah/VA IRB #90978
- Comprehensive query of patient records in the DoD for recent diagnostic codes (ICD-9 341.0 and ICD-10 G36.0) between Jan 1, 2010 and August 1, 2017
- Review of patient records via Joint Legacy Viewer, AHLTA, and Essentrics, the DoD electronic medical record

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**Results**
- Identified 131 unique patients within the DoD system with an ICD code documented in the medical record at least once
  - Of these patients, 39 were confirmed as service members; the remainder were dependent beneficiaries
  - 17 met 2015 diagnostic criteria for NMOSD
    - Patients were categorized as:
      - NMOSD with documented AQP-IgG seropositivity: 15
      - Seronegative NMOSD: 2
    - 22 did not meet diagnostic criteria for NMOSD:
      - Alternative diagnoses: 15
      - Insufficient evidence to determine diagnosis: 7
- Of the 17 patients meeting diagnostic criteria for NMOSD:
  - Sex:
    - Female: 9
    - Male: 8
  - Ethnicity:
    - African American: 6
    - Caucasian: 6
    - Asian: 1
    - Hispanic/Latino: 1
    - Other: 2
    - Unknown: 1
  - Average age of onset: 39.3
  - Range of ranks from junior enlisted (E3) to officers (O4)
  - DoD follow up ranged from 6 to 168 months
  - Average modified Rankin scale (mRS) at final follow up: 2
- Of the 22 patients not meeting diagnostic criteria diagnoses included:
  - Demyelinating disease/ multiple sclerosis (7), isolated myelitis (4), isolated optic neuritis (3), mixed connective tissue disorder (1), insufficient data (7)

**Conclusions**
- This is a first-ever characterization of NMOSD in the DoD population.
- Demographics and clinical characteristics agree with prior reports, with the exception of sex ratio, which may reflect a unique influence of this population.
- The study is limited by the time range (2010–2017) of analysis, and will benefit from further evaluation of additional DoD cases prior to 2010.

**References**

**Figure 1: Clinical Events**
- Spinal Cord
- Optic Nerve
- Brain
- Cervical	1
- Thoracic	1
- At least one
- Recurrent
- Bilateral
- Methylprednisolone
- IVIG
- Azathioprine
- Methotrexate
- Rituximab
- OCB positive
- OCB result not found

**Figure 2: CSF characteristics**
- Elevated protein
- CSF IgG
- DQB positive
- DQB result not found

**Figure 3: Treatment exposure**
- OCB positive
- OCB result not found