

*The Lebanese LSICDM***Viral infections of the central nervous system in Qatar: epidemiology, pathogenesis and clinical outcomes**

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**Abstract**

**Introduction:** Virus-induced diseases of the central nervous system (CNS) represent a significant burden to human health worldwide. They are common causes of morbidities and mortality. There are no previous epidemiologic studies about viral CNS infections done in Qatar or in the Gulf region. We conducted this study to determine the etiology, clinical and epidemiological characteristics, and outcome of viral central nervous system infection in patients across a larger national healthcare system.

**Methodology:** We retrospectively evaluated all cerebrospinal fluid findings from January 2011 – March 2015 at any of the 7 hospitals in the Hamad Medical Corporation healthcare system. We included those with an abnormal CSF finding in our study. We excluded those with missing medical records, those with no clinical evidence of CNS infection or proven bacterial CNS infection. Based on pre-defined clinical and CSF (lab, culture, PCR) criteria, persons with abnormal CSF and CNS clinical findings were classified as having meningitis, meningoencephalitis, encephalitis or myelitis. We reviewed the laboratory results to determine the proportion of persons with confirmed viral etiology.

**Results:** Among 7690 patients with available CSF results, 550 cases met the case definition criteria for viral CNS infection (meningitis 75%; meningoencephalitis 16%; encephalitis 9%; myelitis 0.4%). Two-thirds (65%) were male and 50% were between 16-60 years old. Persons from Southeast Asia (India, Pakistan, Bangladesh, Nepal, and Sri Lanka) accounted for 39.6 of all infections. A definitive virologic etiologic agent was found in 38%, among whom enterovirus was the most common (44.3%) followed by Epstein-Barr virus (31%) and varicella zoster virus (12.4%). The clinical outcome was overall good, only 2 cases died and the rest discharged to home. Ninety-eight per cent were admitted to medical ward (mean stay  $7.8 \pm 6.4$  days) and 2 % to an intensive care unit. (mean stay  $2.7 \pm 5.4$  days). Among those with confirmed viral etiology, 83.8% received ceftriaxone, 38% received vancomycin and 38% received at least one other antibiotic.

**Conclusion:** Viral etiology is not uncommon among those evaluated for CNS infection in Qatar, and is most commonly seen in Southeast Asian immigrants. Clinical outcomes are generally excellent in this group of patients. Antibiotics are overly used even when a viral etiology is confirmed. There is a need for clinician education regarding etiology and treatment of CNS infections.

**Key words:** viral infection; nervous system; Qatar.

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