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Persistent delayed auditory memory and executive function deficits 5 years after West Nile Virus Encephalitis: A neuropsychological and neuroimaging single case study

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ABSTRACT
There are presently no in-depth published neuropsychological studies of West Nile Virus (WNV) encephalitis patients that have been well-correlated with high resolution structural MRI. In this study a middleaged male who developed West Nile Virus encephalitis five years previously was examined three times over a two year period. We examined him with the Wechsler Adult Intelligence Scales—Fourth Edition and the Wechsler Memory Scale—Fourth Edition (WAIS-IV/WMS-IV) and Advanced Clinical Solutions battery supplemented by tests of attention, executive, motor and sensory functions. Neuroradiological imaging revealed hypodensities within the left hippocampus in the axial and coronal planes with T2-FLAIR MRI. The man was previously high functioning and although he had prior history of well-controlled epilepsy it seems unlikely that the epilepsy could fully account for the neuropathological changes. The patient had previously completed a demanding six year double science degree program before he became ill with WNV and he had been a successful manager and director of a research company. Delayed auditory memory scores were at least two standard deviation units below age expected levels and semantic fluency and Booklet Category Tests of executive function were also in the impaired range. Moreover the illness onset profile of muscle weakness, extreme fatigue, memory complaints as well as inability to carry out research projects involving planning on the job were highly consistent with WNV encephalitis. If the memory and executive function deficits had been premorbid manifestations of epilepsy it is unlikely he would have attained the levels he did educationally and occupationally. This left hippocampal lesion is characteristic of other encephalitic viral infections such as herpes simplex virus. To our knowledge this is the first lateralized WNV encephalitis medial temporal lobe patient in the published literature.

KEYWORDS
West Nile Virus; West Nile Virus Neuroinvasive Disease; Encephalitis; Flaviviruses; Neuropsychological Profiles; Hippocampus; Delayed uditory Memory; Executive Functions; Longitudinal Study; Diffusion Weighted Imaging MRI

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