

## NorVect Conference 2015 – poster session

### **Title: Correlation of volumetric brain imaging with Western blot testing for Lyme Disease**

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**Aims:** Antibody testing alone, when used to confirm Lyme disease (LD), has not achieved a satisfactory diagnostic standard of accuracy and inter-laboratory congruence. Additionally, changes in disease status are not associated with changes in antibody levels. NeuroQuant (NQ), an FDA-cleared volumetric software program, evaluates the volume of 11 brain structures. This program has been used to identify brain abnormalities in patients with traumatic brain injury; and in illness acquired after exposure to water-damaged buildings (CIRS-WDB). Use of volumetric brain imaging in LD is unpublished. We report here NQ results from 80 patients with LD from three medical practices and compare their NQ findings to clinical and antibody-based diagnostic tests.

**Methods:** De-identified NQ findings were recorded using standard MRI protocols. Patients were identified as having LD by attending physicians according to the following criteria: presence of a multisystem, multi-symptom illness consistent with LD; having a history of EM rash after known tick bite; or presence of a positive IgM or IgG Western blot. Patients were stratified as untreated or treated. These patients were compared against a bank of 25 normal controls.

**Results:** The NQ analysis identified structural abnormalities of atrophy of putamen and interstitial edema of the right thalamus of untreated, and the putamen of treated LD patients. These abnormalities were also identified in patients with EM rash but negative Western blot, and differentiated them from patients with successful treatment. NQ findings bore little relationship to Western blot testing, particularly IgM testing, for diagnosis. Antibody status bore no relationship to treatment. NQ showed correction of interstitial edema in right thalamus of treated patients.

**Conclusions:** Use of NQ shows promise as a rapid, accurate and inexpensive tool to assist clinicians in diagnosis and treatment progress for LD.