Pilot Trial of the Diagnostic Utility of Serum-Cleaved Tau Protein in Acute Spinal Cord Injury Patients

Objective:
To investigate the utility of serum-cleaved Tau protein (?*) as a marker for neuronal injury in acute spinal cord injury (SCI).

Methods:
Patients presenting to the Emergency Department of a level 1 trauma center with acute neurologic deficit attributed to SCI were enrolled in this prospective convenience study. Onset time, demographics and neurologic evaluations were recorded. Serum samples were collected at presentation, 12, and 24 hours and then daily for seven days or until discharged. All samples were analyzed using ELISA techniques. A positive result was defined as a serum concentration greater than 0.5ng/1 00?L.

Results:
To date, 13 patents have been enrolled. Tau levels for a representative patient are shown in Figure 1. Of the 13 patients, 7 had positive ? values, with 6 of the 7 patients having neurologic deficit.

Fig 1. Serum Tau concentrations vs. Time from Injury

NOTE: THIS SPACE HAD FIGURES OR GRAPHS WHICH GOT CORRUPTED DURING THE SCAN.

100 90 80 70 60 50 40 30 20 10 0 0 10 20 30 40 50 60 70 80
Time from Injury (Hours) Tau + Tau-
Neurologic Deficit 6 4 Positive Predictive Value 86%
No deficit 1 2 p=0.367, Fischer's Exact Test

Conclusion:
Tau is detectable in the serum of patents with severe spinal cord injury. Although not statistically significant, sixty percent of patients with neurologic deficit had positive ? values, while only thirty percent of intact patients had positive values. All patients with positive ? levels, were positive within 120 minutes of their injury. With a larger sample size and without technical errors with the ELISA, the statistical significance of the test may be reached.