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Deltoid Denervation Is Predictive of Diaphragm Denervation in ALS Patients *Erica P. Simpson, David Rosenfield, Houston, TX*

OBJECTIVE: We hypothesize that deltoid denervation in ALS predicts diaphragm denervation and respiratory dysfunction. **BACKGROUND:** We previously reported (Simpson et al, 2006, abstract) that diaphragm denervation in ALS is present in 25% of 18 ALS patients with forced vital capacities greater than 70 cm H2O and may be a sensitive indicator of early respiratory dysfunction. For various reasons, EMG assessment of diaphragm function is underutilized (Bolton, 2005). We therefore, tested our hypothesis with 31 ALS patients evaluated at the Methodist Hospital Neurological Institute. **DESIGN/METHODS:** We retrospectively studied these 31 ALS patients for deltoid and diaphragm denervation, as well as measures of respiratory function and disease disability. Deltoid and/or diaphragm denervation were scored categorically as present or absent based upon standard criteria (fibrillations, positive sharp waves, fasciculation, decreased recruitment, increased polyphasia). Numerical values for forced vital capacity and maximal inspiratory pressures were used as measures for respiratory function. Disease disability was measured with the Appel ALS rating scale and ALS-FRS at time of testing. Correlation analyses of study variables were performed with linear regression and Chi square analysis. **RESULTS:** Thirty-one ALS patients [66% male; 58 ± 14 years] had both right and/or left deltoid and diaphragm by EMG assessment. The average AALS and ALS-FRS scores were 66 ± 25 and 40 ± 6.9 , respectively, at time of study. The average FVC and MIP were 79 ± 23 and 66 ± 33 , respectively. The sensitivity and specificity of deltoid denervation for diaphragm denervation was 83% and 69%, respectively. The positive predictive value of deltoid denervation was 80% for diaphragm denervation. There were no correlations between deltoid or diaphragm denervation and level of disability, FVC, or MIP. **CONCLUSIONS/RELEVANCE:** We conclude that deltoid denervation in ALS patients predicts diaphragm denervation. The study is presently ongoing to increase the sample size and determine if deltoid or diaphragm denervation is predictive of respiratory dysfunction.

Disclosure: Dr. Simpson has nothing to disclose. Dr. Rosenfield has nothing to disclose.

