

A NOVEL DYSPHAGIA ASSESSMENT AND CLASSIFICATION MODEL TO EVALUATE MECHANISMS OF DYSPHAGIA IN NEUROMUSCULAR DISEASE

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INTRODUCTION: Dysphagia in neuromuscular disease (NMD) is prevalent in up to 100% in some disorders and can result in failure to thrive, pneumonia, and death. Regular assessment and grading of severity to inform management in NMD is critical. However, the spectrum of swallowing abnormalities in NMD has not been fully characterized. Clinically relevant assessment tools have not been validated in this varied patient population.

OBJECTIVE: To develop a dysphagia classification system based on quantitative assessment of videofluoroscopic swallow studies (VFSSs).

METHODS: This study involved data abstraction from an NMD clinical database (1990-2013) undergoing VFSS; 19 NMD disease diagnoses were classified into 3 groups: upper motor neuron (UMN) disease, lower motor disease (LMN) disease, and combined UMN/LMN disease. Total pharyngeal transit time, pharyngeal constriction ratio (PCR), esophageal opening, hyoid displacement, and hyoid to larynx approximation data were collected.

RESULTS: The most common diagnoses were ALS, myotonic muscular dystrophy, and Duchenne muscular dystrophy (n=157). The mean (\pm SD) age of the cohort was 53.5 (21.8) years. Significant differences in PCR existed between groups. Using an ordinary least squares (OLS) regression model, PCR was elevated on average of 0.264 in the LMN relative to UMN when controlling for age, gender, and aspiration status (model $r^2=0.38$).

SUMMARY/CONCLUSION: LMN NMD is associated with a higher PCR than UMN NMD. A high PCR indicates poor pharyngeal constriction (>0.25) which is associated with dysphagia and aspiration, and may be a clinically applicable outcome measurement tool used to determine management strategies and efficacy of treatments in NMD subtypes.