Characterization of Dysphagia Onset in a Mouse Model of Amyotrophic Lateral Sclerosis (ALS)

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ABSTRACT

The primary goal of this study was to characterize dysphagia onset and progression in the low copy number *SOD1-G93A* (*LCN-SOD1*) mouse model of ALS. A secondary goal was to determine the effect of serial radiation exposure throughout the lifespan on dysphagia severity. To accomplish this goal, we used our lab's established Videofluoroscopic Swallow Study (VFSS) assay to objectively assess swallow function in 54 mice, divided into serial versus single radiation exposure groups. The serial X-ray exposure group underwent VFSS testing once a month, starting at 2 months of age until disease end-stage. The single X-ray exposure group underwent VFSS testing only once at disease end-stage. VFSS videos from both groups were analyzed to quantify 8 swallow metrics. Results showed that all swallow metrics were similar within and between genotypes from 2 to 6 months of age. At disease end-stage, *LCN-SOD1* mice had significantly altered swallow function for 5 of the 8 VFSS metrics under investigation, compared to age-matched controls. Two main findings emerged from this study. First, dysphagia onset in *LCN-SOD1* mice did not occur until after 6 months of age. Our second novel finding was that dysphagia severity at disease end-stage was similar for single versus serial radiation exposure in *LCN-SOD1* mice, which provides evidence that our lab can continue to perform longitudinal VFSS studies in this small animal without confounding outcomes relative to dysphagia.