**Authors:** *Hinojosa O, Llamas M, Longnecker D, Almazan A, Furuya H, Calhoun T, Vauo EO, Carnaby G,*

**Title:** Spontaneous swallowing frequency in Parkinson's Disease (PD) reflects swallow integrity: a case-control study

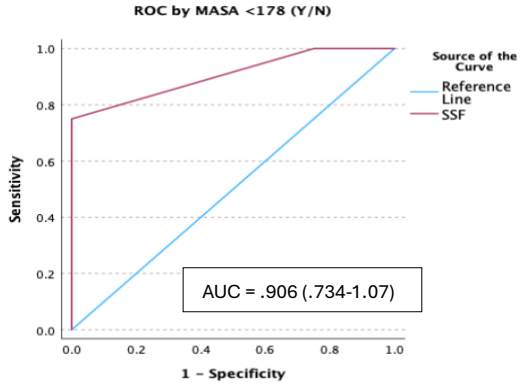
**Purpose**: When spontaneous swallowing (SSF), an innate protective mechanism, is impaired, aspiration prevalence and the risk of pneumonia are increased, especially in individuals with dysphagia. Data on SSF change and its significance in Parkinson's disease are unknown. This study compared SSF rates in a cohort of early PD patients to age and gender-matched healthy controls.

**Methods:** Sixteen PD cases were compared to two (gender and age) matched controls [1:2], total sample N = 48. Age band matching was conducted using a 5-year bandwidth. Controls were drawn from a cohort of community elderly verified as non-dysphagic by self-report (EAT-10), MASA, and medical confirmation. SSF was compared across groups using McNemar's test for paired differences, odds ratio (OR), and number needed to treat (NNT). The receiver operation curve (ROC) plus the Youden index modeled the ability of SSF to distinguish dysphagia.

**Results:** The mean PD severity (Hoehn and Yar) for cases was 2.9 (SD: 0.65). The prevalence of dysphagia (MASA ≤178) in cases was 66%. The mean SSF for cases (0.13, SD: 0.08) and controls (0.83, SD:0.2) was significantly different [$\chi^2$ = -25.7 %, P<.02]. SSF demonstrated an inverse strong relationship to PD severity (by Hoehn and Yah), [r = -.57, P<.02]. The sensitivity of SSF to identify dysphagia was 91.67%, and specificity 91.67, with a positive likelihood ratio of 11. The OR was 121 (9.86-1484), and NNT= 1.2, p<.0002. ROC analysis revealed Youden = 0.75, AUC= 0.906 (95% CI: 0.73-1.07), P<.001, with SSF ≤ 0.1 as the optimal cut point to distinguish dysphagia [Fig 1.].

**Conclusion:** PD subjects present with significantly lower SSF than age and gender-matched controls. SSF appears to reflect the swallowing function integrity of PD cases. A cut point of ≤ 0.1 is significantly associated with early dysphagia in PD.

Figure 1. Receiver Operator Characteristic Curve (ROC)

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