**Clinical Question [patient/problem, intervention, (comparison), outcome]:** In patients with neurogenic dysphagia, is pulse oximetry a reliable assessment tool in identifying episodes of aspiration?


**Design/Method:** Prospective, double-blinded non-randomised experimental study.

**Participants:** 46 adults (26 male and 20 female; 41 to 95 years), all identified as likely to have an abnormal MBS result, on the basis of bedside assessment. Dysphagia was due to Stroke (N=16) and ‘Other’ (N=30). Exclusion criteria: supplemental O₂ required.

**Experimental Group:**
- Each subject underwent MBS (performed by a radiologist and 1 of 3 SLPs), all of whom were blinded to SpO₂ readings. Pharyngeal phase of swallowing was evaluated.
- Continuous SpO₂ readings with a 5-6 second sampling interval were obtained using a Puritan-Bennett Pulse Oximeter.
- Baseline SpO₂ was obtained for a minimum of 1 minute prior to initiation of MBS, and for 3 mins after conclusion of MBS to account for delayed effect of aspiration on SpO₂.
- SpO₂ decline for each pt was defined as the difference between baseline SpO₂ for that pt and the lowest SpO₂ recorded after any presentation during MBS.
- Barium liquid, paste and crackers were then given (bolus size began at 5ml → reaching 15ml if tolerated).
- Pts were monitored for evidence of penetration or aspiration, and clearance of same.
- The effect of consistency or volume of aspirated/penetrated material on the degree of O₂ desaturation was not reported.

**Control Group:** Nil

**Results:**
- The levels of SpO₂ decline ranged from 1% - 12% for patients who aspirated; 0% - 7% for patients who penetrated, and 0% - 8% for patients who penetrated and cleared. There was a decline of 0% - 4% for patients who did not penetrate. These associations between O₂ de saturation and MBS outcome were statistically significant.
- There was no significant association between baseline SpO₂ and MBS outcome.
- There was no significant correlation between diagnosis of stroke and MBS outcome.
- Subjects who penetrated and cleared on MBS were significantly younger than any of the other groups.
- Pulse oximetry was accurate in identifying 74% of participants who either aspirated, or penetrated and did not clear.
- Results also suggested a relationship between degree of oxygen desaturation and the severity of pharyngeal dysphagia.
- Inter-rater reliability between SLPs and Radiologist = 99%
**Comments**

**Strengths:**
- SLPs and Radiologist blinded to real-time SpO$_2$ readings during MBS
- Inter- and intra-rater reliability measured for detecting penetration/aspiration on MBS between SLPs and radiologist.
- Definitions of SpO$_2$ measures and airway entry well defined

**Weaknesses:**
- Small population size
- No control group (e.g. a population with no dysphagia history)
- ‘Other’ diagnoses not defined.

**Level of Evidence (NH&MRC):** Level IV

**Appraised By:** Adult Swallowing EBP Group

**Date:** July 2009