



NSW Speech Pathology Evidence Based Practice Interest Group

Critically Appraised Paper (CAP)

CLINICAL BOTTOM LINE: There is no significant relationship between aspiration and changes in SpO₂ levels during feeding, identified using pulse oximetry. However, individuals who aspirate are more likely to have lower SpO₂ levels before, during and after oral feeding.

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

Citation: Colodny N, *Effects of Age, Gender, Disease and Multisystem Involvement on Oxygen Saturation Levels in Dysphagic Persons* Dysphagia 16: 48-57 (2001).

Design:

Blinded prospective, controlled, non-randomised design.

Participants: N= 181 (117 female, 64 male)

Experimental group: N= 104 (age range 62-102 years; mean age not identified), subjects all residents of a large Nursing Home, identified as having significant signs of pharyngeal dysphagia from clinical examination by SLP (Speech-Language Pathologist). Subjects were classified as having either dementia, COPD or a history of CVA.

Control group: N= 77 (age range 23-93 years; mean age not identified), healthy community-dwelling subjects with no suspected dysphagia, no history of neurological disease or head and neck cancer. All control subjects managed a normal diet.

Experimental Group: - Evaluation of swallow using FEES (Fibreoptic Endoscopic Evaluation of Swallowing) with concurrent measurement of SpO₂.

- Baseline SpO₂ and heart rate measures taken over a 10 minute period prior to FEES, every minute during and for 10 minutes following FEES.
- Subjects given 5-150mL of liquid or puree as tolerated until aspiration.
- SLP performing FEES was blinded to SpO₂ readings.
- 2 SLPs trained in FEES confirmed aspiration and penetration on FEES videotape.
- The time of aspiration was matched to corresponding SpO₂ printouts and marked on the printout sheet by an independent reviewer.
- A 3rd SLP reviewed the tapes with SpO₂ printouts.

Control Group: - Subjects were given approx. 150ml of a liquid, a puree and a chewable solid with concurrent monitoring of SpO₂ over a similar time frame to the experimental group. No FEES was performed with control group subjects.

Results:

SpO₂ levels were analysed with reference to the age, gender, diagnosis and presence of multisystem disease of subjects. Normals under 65 yrs old were eliminated to produce greater age equivalence among the four diagnostic groups (penetrators, solid aspirators, liquid aspirators and normals).

Analysis by:

Diagnosis

- Subjects with CVA: SpO₂ levels *declined* during feeding and *rose* after feeding
- Subjects with Dementia: SpO₂ levels *declined continuously* during feeding phases.
- Subjects with COPD: SpO₂ levels *rose* during feeding, and had lower SpO₂ levels than all other groups before and after feeding.

Results (Cont'd)**Age**

- No significant relationship between age and SpO2 levels during feeding.

Gender

- No significant relationship between gender and SpO2 levels during feeding.

Dysphagia Groups

- Individuals with dysphagia do not necessarily desaturate while aspirating.
- Individuals who do aspirate are more likely to have lower SpO2 levels before, during and after oral feeding.
- Solid aspirators had *significantly* lower SpO2 levels than all other groups during all phases of feeding.

Comments – Strengths/weaknesses of paper

- Procedure was not matched between control and experimental groups: Control group was evaluated subjectively by a SLP without the use of FEES technique.
- Complex design, with a number of variables included in analyses (including age, gender, medical diagnosis and dysphagia severity groups), making overall interpretation of 'clinical bottom line' challenging.

Level of Evidence (NH&MRC): III(2)**Appraised By: Adult Swallowing EBP Group****Date: August 2009**