Which aspects of early dysphagia assessment and management reduce aspiration?

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Post Stroke Dysphagia

Dysphagia incidence varies:
• Timing of assessment
• Tools used:
Martino et al systematic review (2005)
  screening assessment, 37-45%
  clinical assessment, 51-55%
  instrumental assessment, 64-78%

• RCP guidelines 5th Edition 2016 between 40 and 78%.
What is known:

- Evidence that identification of dysphagia, its type and severity is essential in reducing:
  - the risk of pneumonia (Bray et al., 2016; Palli et al., 2017; Masrur et al., 2013)
  - mortality (Ingeman et al., 2011; Koennecke et al., 2011)
  - poor outcomes (Turner et al., 2015; Middleton et al., 2011)
  - costs (Katzan et al., 2007; Odderson et al., 1995).
- stroke-related dysphagia increases post-stroke medical expenses by nearly 25% (Bonilha HS et al. 2014)
Aspiration

• Material passes below level of vocal cords
• Aspiration may trigger cough reflex or may be ‘silent’
What is known

• Dysphagia resulting in aspiration of foods, liquids, or oral secretions, is thought to be primary risk factor for pneumonia after stroke (Wilson et al 2012)

• Dysphagic patients are 3 times, and those with confirmed aspiration 11 times, more likely to develop pneumonia. (Kumar et al 2010, Rofes et al 2011)
What is not known

• How much aspiration results in aspiration pneumonia? Normals aspirate small amounts (trace aspiration in older people)
• Volume and frequency of aspiration
• Is it important what consistency/food type is aspirated?
Timing: Delays in screening and assessment

- Bray et al. (2016) SSNAP registry data
- 63,650 patients admitted with acute stroke,
- 55,838 (88%) had a dysphagia screen
- 24,542 (39%) a comprehensive dysphagia assessment.
- Patients with longest delays in dysphagia screening and SALT dysphagia assessment had a higher risk of stroke associated pneumonia (SAP).
- Risk of SAP increased in a dose-response manner with delays in SALT dysphagia assessment, with an absolute increase of pneumonia incidence of 1% per day of delay.

- Limitation data is from a registry so relies on accurate data collection

Screening tools

• Screening- determines presence or absence of dysphagia.
• If screen is ‘failed’ then referred for clinical assessment
• Should aim to identify highest risk patients for further assessment
• Screen should be sensitive, specific, easily administered without extensive training
• Non-invasive and quickly interpretable
• Timely and cost-effective
Recommendation

Stroke Guidelines 2016

- Patients with acute stroke should have their swallowing screened, using a validated screening tool, by a trained healthcare professional within 4 hours of admission to hospital before being given any oral food, fluid or medication.
Methods of screening

- 3oz Water swallow test
- Locally developed screening tests
- Gugging swallow (Trapl 2007)
- Toronto Bedside Swallowing Screening Test (TOR-BSST)

- Differing amounts of liquid boluses, some use solid textures with different quantities and viscosities
- Cough elicitation task- mist of citric acid (Wakasugi et al 2008)
- Oxygen sats during swallowing (Clave et al 2008)
Lack of standardisation in screening tests

• There is good evidence that a multi-item dysphagia screening protocol that includes at least a water intake test of 10 teaspoons and a lingual motor test was more accurate than screening protocols with only a single item (Martino et al., 2014).

Questions

• Which aspects of the screening are the important aspect
• Timing

• Is it individual components included in the screening protocol

• If low sensitivity- may allow inappropriate pts to eat and drink
• If low specificity- unnecessarily placed nbm
Cough reflex testing

- Up to 68% of patients seen to aspirate on VF fail to cough (SIGN 2010)
- Cough reflex testing
- Cough reflex testing alone is insufficient
- Cough strength testing - diminished cough has been associated with aspiration (Miles 2013)
- Incorporation into assessment didn’t change outcome (Miles 2013)
- Strength of cough? (Wallace et al 2017)
- Study findings Reflexive cough and voluntary cough may eject penetrated material but were ineffective at expelling aspirated material
Clinical assessment

• Assessment- determines the nature and severity of the dysphagia itself
• Stroke Guidelines 2016

In patients with dysphagia on initial screening, a specialist swallowing assessment is indicated that includes consideration of function and cognition and a broader range of food and fluids of varying texture.
Clinical assessment

• What is included differs between assessments
• No standardisation in assessment process
• No one validated tool in common usage across UK

• What is included- oro-motor examination, cranial nerve assessment, dietary textures, differing bolus size

• Which aspects of assessment are key?
Instrumental assessment

• Stroke guidelines 2016
• Systematic review suggests that the investigation of dysphagia with instrumental assessments helps to predict outcomes (Kertscher et al., 2014)

• Lack of instrumental in first 72 hours
• Can we accurately detect silent aspiration without instrumental assessment?
Continued Relevance of Videofluoroscopy in the Evaluation of Oropharyngeal Dysphagia

Daniels & Easterling 2017

• If the primary rationale for performing an evaluation of oropharyngeal swallowing is to assess anatomy, physiology, and determine management and rehabilitation of swallowing disorders, VFSS remains the most efficient and efficacious instrumental tool.

• Use of a standard protocol, can limit radiation exposure by increasing efficiency of the examination
• Barium is associated with decreased taste intensity, however, it has not been shown to adversely affect swallowing behaviour in healthy adults.
• VFSS yields critical oral phase information missed with FEES. VFSS also provides important diagnostic information essential in managing and planning patient therapy not available with FEES
What aspects of early assessment might reduce aspiration?

• Timing of screening and assessment
• SLT not 24 hour 7 day week service
• Palli et al 2017- 24/7 screening by nurses lead to reduced pneumonia rates
• Instrumental assessment
• But requires specialist staff and equipment and cannot easily be conducted within first few hours after stroke onset
Early management and oral hygiene

• Good oral hygiene is important particularly for those who aspirate

• Oral hygiene- poor oral hygiene may be exacerbated by early decision for nbm especially if severe dysphagia
• No guidelines in UK for best practice in terms of equipment to be used, procedure to follow or frequency of care.

Study in 11 UK stroke units found:
• a lack of understanding about the importance of oral care
• inconsistent practice, a lack of equipment and materials, and inadequate training and education for staff and carers (Horne et al 2015)
Early management

- Aspiration of colonised bacteria from poor oral hygiene
- During NG tube placement- bacteria can be passed from oral cavity to pharynx
- Early decision for NG feeding may not reduce aspiration
- Mamum & Lim (2005) 122 pts over 65 years NG fed patients did not have improved outcome against aspiration pneumonia
- Mechanism of aspiration: could be loss of integrity of upper and lower OES sphincters, reduction in salivary flow and colonisation of Gram-negative bacteria in oral and pharyngeal flora
What aspects of early management might reduce aspiration?

• Thicker liquids can minimise the risk of aspiration (Logemann, 1998; Garcia et al, 2005; Rofes et al, 2014).

• Differences have been shown in aspiration rates across liquid consistencies, showing higher aspiration rates for thin fluids compared to thicker liquids (Kuhlemeier et al, 2001).

• Systematic review (Steele et al, 2015) report evidence to show that thicker liquids reduce the risk of aspiration.
Modified fluids

• Thicker liquids reduce the risk of penetration – aspiration, but also increase the risk of post-swallow residue in the pharynx (Steele 2015)

• Very thick liquids and solid food materials require greater strength in terms of the tongue propulsive forces to drive material through the oropharynx and there is a propensity of thicker fluids to remain in the pharynx post swallow (Clave et al., 2012; Steele & Huckabee, 2007; Clave et al., 2006).
Compensatory strategies

• There is some evidence of a reduction in aspiration with swallowing strategies. (Bulow et al 1999; Speyer et al 2010)
• Postural changes eg chin tuck
• Swallowing strategies eg effortful swallowing
• Dietary modification, swallowing exercises and environmental changes including positioning may reduce dysphagia, although the specific components of each remain unclear (Geeganage 2012 Cochrane review)
What aspects of early management might reduce aspiration?

- Starch vs gum based thickeners
- Starch-based drinks mixed with saliva can become thinner as the drink is broken down by the enzyme amylase. This then reduces the effectiveness of the thickened fluid and can pose a safety risk to the patient (Penney, 2014).
- In contrast, gum-based thickeners are resistant to amylase and thus generally maintain their thickness when they mix with saliva.
What aspects of early management might reduce aspiration?

Workforce

• Expertise of person doing screening and assessment
• Availability of trained staff
• Expertise of the person deciding management intervention
• Clinical skill and choice of intervention
• Staff and patient adherence to recommendations
• Should we have more controlled management protocols?
There comes a point where we need to stop just pulling people out of the river. We need to go upstream and find out why they're falling in.

— Desmond Tutu —
Further research needed

Ways to reduce aspiration is multifactorial
• Need better understanding of process of care within first 72 hours
• Need a diagnostically accurate tool
Protocol for Cochrane review 2017 ‘Screening for aspiration risk associated with dysphagia in acute stroke. Boaden E et al
Reviewing currently available screening tools
• Need to explore new methods to identify silent aspiration at bedside (proof of concept)

• Need more clinically focused management (targeted at specific deficit and evaluated to determine effects on aspiration)
Predictors of aspiration pneumonia: how important is dysphagia

- Elderly in nursing homes – not stroke specific
- 189 subjects followed for 4 years
- Best predictors for aspiration pneumonia included:
  - Dependency for feeding
  - Dependent for oral care
  - Number of decayed teeth
  - Tube feeding
- Dysphagia was an important risk factor, but generally not sufficient to cause pneumonia unless other risk factors present too
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References

• SIGN. Management of patients with stroke: identification and management of patients with dysphagia. 2010
References

- Wallace E, Macrae P, Huckabee ML. How strong is strong enough to clear aspiration. ESSD Abstract book 2017 p109