

Swallowing and oropharyngeal dysphagia

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Introduction

Oropharyngeal dysphagia and aspiration are common and important problems affecting older people. They are also closely related, given that patients with dysphagia are at increased risk of aspiration and, as a result, are associated with significant morbidity and mortality. Silent aspiration is common among older people and a high index of suspicion is required, which should be followed by appropriate multidisciplinary assessment and management.

Normal swallowing

Normal swallowing is a complex movement that comprises voluntary and involuntary actions. It can be divided into oropharyngeal and oesophageal phases.

The oropharyngeal phase is voluntary and depends on motor and sensory pathways that move food posteriorly through the oral cavity to the oropharynx, triggering a series of reflexive movements. Afferent inputs from the trigeminal, glossopharyngeal and vagal nerves carry information about the size and type of bolus, and produce a swallow response,¹ accompanied by elevation and anterior movement of the larynx to meet with the epiglottis for protection of the airway.

During the oesophageal phase, the bolus passes through the upper oesophageal sphincter into the oesophagus. The lower oesophageal sphincter relaxes and food is pushed into the stomach by peristalsis and gravity.

Dysphagia

Dysphagia refers to difficulty in swallowing, with a reported prevalence ranging from 14% to 35% in community-dwelling older adults^{2,3} and 51% in older adults in long-term care institutions.⁴ Given that oropharyngeal dysphagia is the

most common form of dysphagia, often referred to simply as 'dysphagia' in clinical practice, it is the focus of this article. Oropharyngeal dysphagia can be characterised by difficulty in initiation of swallowing and the impaired transfer of food from the oral cavity to the oesophagus. Although many of those affected do not volunteer symptoms, symptomatic complaints include swallowed material sticking in the throat, coughing or choking, a 'wet' or gurgling voice, oral regurgitation and weight loss.

Dysphagia becomes more common with increasing age because most of the causative disorders have an age-related prevalence, primarily neurological and/or neurodegenerative diseases; 47.5% of patients discharged from an acute geriatric unit over a 7-year period had oropharyngeal dysphagia.⁵ Dysphagia resulting from stroke occurs in over 50% of patients acutely, but persists in only 10% after 14 days,⁶ whereas in neurodegenerative diseases, such as dementia, it is progressive. A study of nursing home residents found that 31% were on altered diets or were tube fed, mostly because of dementia (53%), stroke (25%) or progressive neurological disease (8%).⁷ More recently, oropharyngeal dysphagia has been recognised as occurring in a significant proportion of patients with exacerbations of chronic obstructive pulmonary disease (COPD).⁸

Complications of oropharyngeal dysphagia

Inadequate oral intake because of dysphagia can cause dehydration and malnutrition, and lead to depression and deterioration in the quality of life. It can also result in choking, airway obstruction and even death.

Aspiration (the inhalation of oropharyngeal or gastric contents into the larynx and lower respiratory tract) occurs in just over 50% of cases of dysphagia. Of these, a further 50% can have 'silent aspiration',⁹ which is more common in older patients and occurs without the usual clinical signs and symptoms, such as coughing. Often the only clues might be fever or a decline in oxygen saturation, although these also lack sensitivity.¹⁰

Although there is often overlap between the two entities, aspiration pneumonitis is a chemical reaction in the lung parenchyma caused by inhalation of sterile gastric contents. By contrast, aspiration pneumonia relates to an infectious process caused by inhalation of oropharyngeal secretions colonised by bacteria.

Older patients with dysphagia have an increased risk of hospitalisation for pneumonia (hazard ratio [HR] 1.6) and aspiration pneumonia (HR 4.48).⁵ Ten percent of admissions

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with pneumonia from the community will have aspirated, compared with 30% from care facilities, with associated increased rates of intensive care unit admission, ventilation and mortality.¹¹ Similarly, another study of 134 consecutively older patients admitted with pneumonia found that 55% had signs of oropharyngeal dysphagia.¹²

Assessment

There are various methods of assessing for the presence of dysphagia, starting with a screening assessment through to an in-depth instrumental assessment. Evidence for dysphagia screening generally arises from studies in stroke, but can be applied to other populations.¹³ There are multiple screening tools available, generally based on a modified water-swallowing test, but a systematic review conducted in 2012 identified only four, performed by nurses or physicians, that met basic criteria for validity, reliability and feasibility, with high sensitivities of $\geq 87\%$ and negative predictive values of $\geq 91\%$.¹⁴

Screening tools typically involve observations of medical status, facial musculature, swallowing of a small bolus and observation of a full meal. All physicians whose practice involves the care of older people should ensure that this form of screening is routinely available: liaison with their local speech and language therapists, geriatric medicine and stroke services can be of assistance in developing such protocols.

Patients failing the screen are typically referred to a speech and language therapist for further bedside assessment: this involves in-depth assessment of the patient's clinical history, current medical status, including nutritional and respiratory status, cranial nerve function and swallowing function.¹⁵ During the initial assessment, compensatory strategies, such as head posture, bolus modification and modification of diet and/or fluid consistency, might be recommended. Although compensatory strategy terminology is fairly standard internationally, this is not the case for modified diet and fluid consistencies, with multiple different terminologies within and between countries. To overcome this, an initiative to standardise terminology has started, with anticipated release in early 2015.¹⁶

Although bedside evaluation is the most common form of dysphagia assessment, aspiration might not be detected, especially if it is silent.¹⁷ When uncertainty remains, further instrumental investigation, such as videofluoroscopy, might be necessary.

Investigations

Videofluoroscopy, also known as modified barium swallow (MBS), is the most widely used investigation for oropharyngeal phase dysphagia and is more sensitive than bedside testing alone.¹⁷ An advantage of this procedure lies in its dynamic nature, enabling assessment of the possible responses to aspiration, such as throat clearing or coughing in real time. Fibre-optic endoscopic evaluation of swallowing (FEES) is the main alternative assessment tool. It is usually performed at the bedside and has the benefit of avoiding radiation as well as providing sensory testing (via air insufflation or direct pressure onto the relevant muscles to provoke contraction), but can involve some discomfort for the patient because the endoscope is placed through the nose to the level of the soft palate.¹⁸ It has

mostly been evaluated in post-stroke patients and shown to predict outcomes accurately.¹⁹

The two modalities are approximately equal in their detection of dysphagia and pneumonia risk reduction,²⁰ although it has been suggested that the severity of aspiration is assessed as higher when FEES is used.²¹ If the cause of dysphagia is still unclear after both tests, referral can be made to an ear, nose and throat (ENT) specialist or gastroenterologist for consideration of upper gastrointestinal endoscopy, manometry or full barium swallow.²²

Treatment of dysphagia

If a patient is suspected of having dysphagia, and to be at risk of aspiration, it is safer to put 'nil by mouth' initially. The subsequent management plan is influenced by factors such as cause, prognosis, comorbidities (particularly dementia), pre-morbid swallowing function and findings of clinical evaluation.

Treatment for dysphagia can comprise two forms of management. For immediate and temporary effect, patients with dysphagia can be prescribed compensatory techniques, such as diet and/or fluid modification, posture, sensory enhancement or bolus modification.²³ These management techniques are only effective for each individual swallow and do not improve swallowing physiology in the long term.

Rehabilitation exercises aim to alter swallowing physiology through strength and skill exercises resulting in a permanent improvement in swallowing function.²³ There is some evidence from small positive studies to support rehabilitation exercises, such as Shaker exercise, tongue strengthening exercises and Mendelsohn manoeuvre.^{24–26} Effortful swallow, Masako exercise and stimulation techniques, such as tactile–thermal stimulation and neuromuscular electrical stimulation, currently lack sufficient evidence to support their use and require further investigation before they can be reliably utilised in a swallowing rehabilitation programme in aged care and neurological populations.^{27–30}

The findings of multiple systematic reviews investigating commonly utilised dysphagia interventions (including compensatory and rehabilitation techniques) indicate that there is not yet enough evidence to identify the most effective technique for managing dysphagia and preventing aspiration pneumonia.^{31,32} Until such evidence becomes available clinicians need to continue to adopt a multidisciplinary, patient-centred approach, taking into consideration factors such as patients' ability and willingness to participate.

Treatment of aspiration pneumonia

It can be difficult to differentiate between community-acquired and aspiration pneumonia in older patients, and bacterial pathogens are cultured in only 25% of those hospitalised.³³ Most organisms are aerobic, such that cephalosporins are most commonly used. Gram-negative organisms appear to be more prevalent in institutionalised patients with aspiration pneumonia and should be considered if there is an unsatisfactory response to initial treatment.³³ Metronidazole is often added, given that anaerobic organisms are cultured in 20% of patients with severe aspiration pneumonias.^{33–35} Those unable to swallow tablets because of dysphagia or altered mental state will usually be given parenteral antibiotics.

Key points

Dysphagia is more prevalent in older people because of age-related diseases, such as stroke and neurodegenerative disorders

It is important to identify patients with dysphagia because they are at higher risk of aspiration and resultant pneumonia

Assessment of dysphagia is a multidisciplinary process, starting at the bedside with physicians and nurses and progressing to speech pathology and radiographic and/or endoscopic assessments

There is some limited evidence for swallowing rehabilitation techniques, but further studies are required

Tube feeding for patients with severe dysphagia remains a difficult medical and ethical issue, especially in advanced dementia, and discussions should also encompass alternatives, such as palliative care and 'comfort' feeding

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Upon recovery, the opportunity should be taken to discuss management of future episodes.

Enteral and/or tube feeding

Enteral and/or tube feeding can be considered in patients with severe dysphagia to provide nutrition, but many factors dictate their use and appropriateness, including: cause and expected duration of dysphagia, overall condition of patient and comorbidities, and patient, family and physician preferences.

Dysphagia is usually temporary in stroke patients,⁶ for example, and tube feeding can be delayed for up to a week while swallowing assessment and rehabilitation continue.³⁶ Starting feeding with percutaneous endoscopic gastrostomy (PEG) as opposed to a nasogastric tube within 30 days of stroke is associated with an increased risk of death or poor outcome.³⁶

Evidence of benefit for enteral feeding in chronic neurodegenerative conditions, such as advanced dementia, is lacking, with no randomised clinical trials or evidence of increased survival or nutritional benefit in observational studies.³⁷ Furthermore, the risk of pneumonia persists (56% in one study), with additional complications related to the tube, such as displacement, leakage and blockage.³⁸ Despite this, placement of PEG tubes increased in the USA by 38% over a 10-year period (1993–2003), doubling in patients with Alzheimer's disease from 5% to 10%.³⁹ It is important that feeding options (including comfort feeding), end-of-life issues and palliative care are discussed with patients or relatives, without being perceived as a withdrawal of care.^{40–42}

Conclusion

Although most take swallowing for granted when young, increasing dysfunction and dysphagia are associated with

ageing and diseases of ageing. The resulting morbidity and mortality is usually a consequence of aspiration, but difficult medical and ethical issues also arise relating to provision of nutrition, especially in progressive neurodegenerative disease. Evidence to guide swallowing rehabilitation, and decisions on feeding methods and their benefits, is lacking, or limited to small studies. ■

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