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EDITORIAL

DYSPHAGIA, DEMENTIA AND FRAILTY

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Dysphagia occurs in 15 to 23% of older persons living in the community (1-4). It is prevalent in hospitalized patients, reaching nearly 50% and up to 90% of hospitalized patients with Community Acquired Pneumonia (4, 5). A study from 19 countries found that dysphagia was present in 13.4% of nursing home residents (6). Patients with dementia and dysphagia are more likely to aspirate than nondemented patients (7). Patients with dementia and dysphagia have twice the chance of dying with aspiration pneumonia than those without aspiration (8). As patients with dementia experience decline in their cognitive and functional abilities, behavioral eating deficits become more common and impair their feeding and swallowing abilities. In persons with end stage dementia only 24% feed themselves and 18% are fed (9). The rest either refuse feeding (26%) or choke on their food (32%). This is not surprising as persons with Alzheimer's disease have deficits in all 5 senses, which are essential for the process of eating. Among the eating and drinking problems seen in dementia are: Food refusal, distractibility, visual agnosia, swallowing and feeding apraxia, pocketing food, spitting food, excessive swallows, rapid eating, absent chewing, and delayed or impaired pharyngeal swallow.

Dysphagia can occur early in the dementia process (10) with swallowing problems becoming more pronounced as the disease progresses. Dysphagia is often not recognized in persons with dementia. The signs and symptoms of dysphagia in a patient with dementia are outlined in Table I. Dysphagia can predispose these patients in many serious health consequences such as weight loss, dehydration, malnutrition, and aspiration pneumonia (11, 12).

Eating and swallowing requires cognitive awareness, visual recognition of food, physiologic response, motor planning and execution and patterned sensorimotor responses (13). Thus, as patients experience deficits in attention, initiation, orientation, recognition, executive function, decision-making and apraxia, the process of eating and swallowing is affected. Changes to swallowing physiology vary by the type and severity of dementia (14). Patients with Alzheimer's present with increased oral transit duration, which may be related to sensory awareness of the bolus (15, 16). Persons with Alzheimer's dementia tend to have an increased number of swallows for any given amount in their mouth, a longer duration of the swallow and a longer period of apnea (17). As the disease progresses, these patients develop reduced pharyngeal clearance, reduced upper esophageal opening, and penetration and/or aspiration (18). Patients with dementia also have a decreased sympathetic skin response during swallowing (19). Persons with Lewy-body dementia (20) tend to be more likely to have swallowing dysfunction (90%) compared to Alzheimer's disease (21). They have high levels of pharyngeal dysfunction and aspirate around 45% of the time. In persons with frontotemporal dementia about 60% have dysphagia, but this is only recognized by the caregiver in a third of patients (22). These patients tend to eat rapidly and compulsively and take large bolus sizes (22). There is more frequent early leakage into the pharynx and incomplete pharyngeal clearance. Persons given atypical antipsychotics for behavioral disturbances have markedly increased pneumonia associated with an increased risk of having dysphagia (23-25).

Swallowing evaluation in the individual with dementia begins at the bedside, with a clinical swallow evaluation. This allows the speech pathologist to assess for signs and symptoms of dysphagia but also evaluate functional aspects of swallowing, such as feeding and eating behaviors. A clinical swallow evaluation is not adequate to rule out aspiration, as it underestimates the aspiration risk in individuals who aspirate (14). Thus, an instrumental evaluation of swallowing is recommended to identify the impairment and determine further management of dysphagia.

Dysphagia management may include compensatory and behavioral strategies, diet and environmental modifications. Compensatory and postural changes can be used to alter the swallow in order to compensate for deficits found in an instrumental evaluation of swallowing. Compensatory strategies may include swallow maneuvers or modifications to eating behaviors. Swallow maneuvers can be utilized to modify different physiologic swallowing deficits, such as utilizing a supraglottic swallow maneuver which employs a voluntary breath hold to facilitate early laryngeal closure and protect the airway during the swallow (26). Postural changes, such as a chin tuck or a head tilt, are used to alter the speed and flow direction of a food or liquid, with the intent of protecting the airway to improve safety of the swallow (27). Unfortunately, compensatory and postural changes may not be appropriate for patients with dementia because they require the patient to utilize these strategies with each swallow.

Diet modifications to food textures and liquid viscosity are commonly utilized in management of dysphagia in individuals with dysphagia. Wang et al (28) found that thickened liquids had no statistical decreases in pneumonia and this was true for both nectar-thickened and honey-thickened groups. However, the thickened liquid groups were more likely to be dehydrated,

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have a fever and develop a urinary tract infection. Recent innovations have shown that modified food such as foams, molds, finger food, soaking foods or thickened ice cream can greatly enhance the meal with little increase in aspiration. Changing taste, temperature, volume or viscosity of food may also be used to increase sensory awareness (13).

Interventions to modify the environments such as reducing distractions, limiting background noise, and creating mealtime routines are also commonly utilized to promote successful eating (27). Specialized feeding techniques such as the Spaced Retrieval Technique (29) or Backward Chaining (30) may enhance the ability of patients with dementia to self-feed and enjoy their meal. Hand feeding may become necessary with progression of the disease, should other techniques no longer provide benefit. However, dependency for feeding elevates the risk of aspiration and aspiration pneumonia in patients with dysphagia (22). Furthermore, hand feeding is labor intensive and takes between 45 to 90 minutes a day to feed patients with dementia (31). Most staff spend less time feeding the patient than do family members or volunteers (32, 33). This may increase the patient's risk of aspiration. Caregivers and nursing staff are essential in promoting successful mealtimes for individuals with dementia. Training for staff in nutritional care and assistance with eating is of great importance in maintaining nutritional status.

It is important to establish the person and their family's attitude towards a feeding tube early when they have dysphagia. Too often decisions are made for the first time during a crisis situation when the person has been admitted to hospital. Two-thirds of feeding tubes are placed during an acute hospital stay (34). Although a feeding tube is thought to reduce the risk of aspiration pneumonia, this has not proven to be true (35). Furthermore, there appears to be little difference in survival between persons who are fed by hand and then fed through a gastrostomy tube (36-38). A Cochrane systematic review found that there is "Insufficient evidence to suggest that enteral tube feeding is beneficial in persons with advanced dementia" (39) though there may be limited adverse effects of the intervention (40). McCann et al (41) found that food and fluid administration beyond that requested by the patient does not appear to improve the comfort of terminally ill patients.

Dysphagia is a common cause of protein energy undernutrition in the persons with dementia. Persons with dementia should be regularly screened for anorexia with tools such as the Simplified Nutrition Appetite Questionnaire (SNAQ) (42, 43) and for poor nutrition with the MiniNutrition Assessment (MNA) or its short form (44-46). The dietitian or speech therapist should observe the person eating and the interprofessional team should develop innovative strategies to prevent dysphagia and weight loss early in the disease.

The Frailty Phenotype and Dysphagia

Frailty is the condition when the person is stressed she has diminished ability to carry out important practiced activities of daily living (47). It should be distinguished from disability. Fried et al (48) developed a physical phenotype of frailty consisting of weight loss, exhaustion, weakness (low grip strength), slow walking speed and low physical activity. This physical phenotype is highly predictive of falls, declining mobility and activities of daily living, hospitalizations and death (49). The FRAIL is a rapid screen for frailty that has been validated as a predictor of poor outcomes in over 25 studies (50, 51). It consists of fatigue, resistance (climb a flight of stairs), aerobic (walk one block), illnesses (more than 5) and loss of weight (5% in 6 months) (52). Guidelines for the management of frailty have been published (53). They recommend identification of frailty with a validated tool and, in persons who are frail, a progressive resistance exercise program and management of polypharmacy.

Frailty is associated with an increased prevalence of dysphagia (54-57). The major components of frailty leading to increased dysphagia are sarcopenia, functional impairment, and drugs affecting swallowing (58). Frailty is often associated with increased inflammation (59).

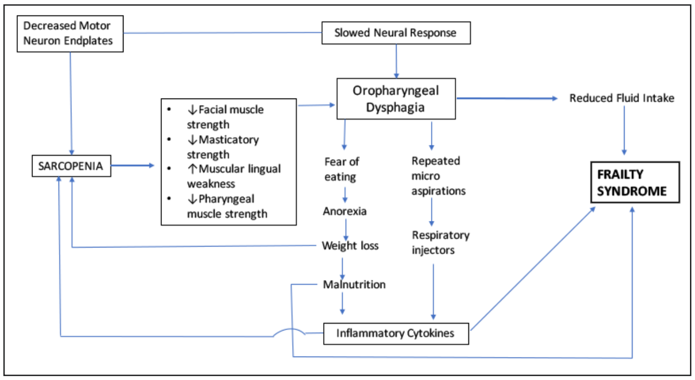
Sarcopenia is defined as a loss of muscle mass that leads to a loss of function (60, 61). Grip strength and walking speed are associated with tongue pressure and to a lesser extent jaw opening force in men (62-68). Similarly, head lifting strength is associated with dysphagia and malnutrition in older persons (69). Importantly, lingual exercises and head extension swallowing exercises improved swallowing in older adults (70-73). For these reasons, it is reasonable that the EAT-10 should be carried out in all frail and sarcopenic patients to assist in identification of individuals with dysphagia (74).

The interrelationship between oropharyngeal dysphagia, sarcopenia and frailty is shown in Figure 1. The approach to the management of oropharyngeal dysphagia requires the utilization of Patient Centered (P4) Medicine with an interprofessional team (75, 76). While the P1 – Predictive component of dysphagia is still in its infancy, there is some evidence that neurostimulation may work better in association with some markers such as brain derived neurotrophic factor (77) and there is the possibility that high circulating myostatin levels may be ideal for treatment with myostatin peptobodies (78, 79) at the P-2 level (Preventive) screening with the EAT-10 in all FRAIL and SARC-F positive patients makes sense. At the P-3 (Personalized) level there are a variety of early therapies that can be custom fitted to the patient's need. Finally, at the P-4 level (Participation) patient with dysphagia need ongoing support to assure compliance.

Table 1
Symptoms of Dysphagia in a Patient with Dementia

1. Weight loss
2. Refusal to eat
3. Refuses to open mouth
4. Leaves food on plate
5. Spits out food
6. Coughs while eating
7. Does not swallow
8. Touches throat or chest while swallowing
9. Drooling
10. A wet or "gurgly" voice
11. Chews without swallowing
12. Recurrent urinary tract infections due to dehydration

Figure 1
Mechanisms of Dysphagia



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