Nutrition Assessment and Intervention in the Patient with Dysphagia: Challenges for Quality Improvement

Juan B. Ochoa
Nestlé HealthCare Nutrition, Nestlé Health Science, Florham Park, NJ, USA

Abstract
Dysphagia, a symptom characterized by difficulty swallowing, is an independent predictor of poor outcome, worsening morbidity, increasing the risk for hospital readmissions, health care costs and mortality. Dysphagia is a result of a number of illnesses including neurological diseases, after surgery for head and neck pathology, observed in the intensive care unit after prolonged endotracheal intubation among others, and is particularly frequent in the elderly. Dysphagia increases the incidence of malnutrition, which in turn delays patient recovery. Treatment of dysphagia can be successful, but requires the use of multidisciplinary teams. A focus on the management of malnutrition including prevention and treatment is essential. Perhaps the biggest challenge is the lack of awareness of the presence of dysphagia and malnutrition, so that only a minority of patients are identified and successfully treated. We propose that better identification and treatment of dysphagia could occur with the systematic implementation of clinical practice improvement processes with a consequent decrease in morbidity, mortality and cost.

Introduction
Dysphagia is a prominent symptom associated with multiple illnesses. Neurological conditions, including stroke, account for a large number of cases. However, multiple illnesses including head and neck cancer and prolonged intubation in the intensive care unit also add up significant numbers of patients. Dysphagia can occur at all ages, though in our hospitals and institutions, it is a prominent symptom in the elderly.

The symptom of dysphagia is an independent predictor of poor prognosis. As described by Altman [this volume, pp. 119–126], patients with dysphagia
exhibit increased length of stay in the hospitals, increased complication rates and utilization of resources, and more frequently require institutionalized care.

The utilization of health care resources including nursing homes and rehabilitation facilities is significantly increased in patients with dysphagia. There is a consequent increase in cost, which is difficult to define but may constitute hundreds of millions of dollars in the USA alone [1].

Although dysphagia is only a symptom, the biological consequences that arise from this are significant. Dysphagia is associated with aspiration and the development of pneumonia, an illness that may require hospitalization and be the cause of death in these patients. Patients with dysphagia become socially isolated contributing to the emergence of symptoms of depression [2].

**Malnutrition and Dysphagia**

The lack of adequate nutrition is prominent in patients with dysphagia. An evaluation of 8 different trials reported by Foley et al. [3] in stroke patients for example, demonstrated that patients with dysphagia were 2.4 times more likely to develop malnutrition, which became clinically prominent during rehabilitation and recovery. These data suggest that patients with onset of dysphagia are at significant risk of progressing towards malnutrition.

Malnutrition contributes to worsening prognosis in all illnesses, and patients with dysphagia are no exception. Malnutrition worsens the immune system's capacity to heal, negatively affects muscle function (particularly respiratory efforts) and delays or prevents adequate recovery [4]. Pneumonia is a complication of dysphagia and significantly worsened in patients with malnutrition.

Malnutrition in patients with dysphagia possibly occurs as a result of several mechanisms. Traditional belief dictates that malnutrition occurs as a result of poor oral intake and is the result of prolonged starvation. This, starvation-related malnutrition is traditionally observed in the third world due to lack of availability of nutrients and caused by natural disasters or political strife. In developed countries, starvation-related malnutrition is not frequently acknowledged, and thus may not be adequately diagnosed. Starvation-related malnutrition occurs in patients with dysphagia who will be incapable of eating as a result of impairment in maintaining activities of daily living such as that seen in patients with neurological diseases. It can also be the result of progressive aversion to eating as the result of choking and pulmonary impairment.

Starvation-related malnutrition is treated with adequate food replacement. Every effort should be done at adequate prevention. Physicians appropriately focus on patient stabilization and treatment of the acute illness (after a stroke for example). As a result, the provision of adequate nutrition is of secondary importance. Common clinical practices suppress oral intake maintaining the patient nil per os for days or sometimes even longer. As a result, a caloric deficit rapidly
accumulates. Work performed by Villet, and observations by other investigators demonstrate that accumulation of a caloric deficit portends poor prognosis. In addition, policies aimed at providing early oral or enteral nutrient intake are associated with improved outcomes including decreased mortality and cost. Ideally, a plan for provision of adequate nutrition should be instituted within the first 12 h of arrival of the patient to the hospital, through execution of protocols and dedicated personnel [5].

For many years, it has been clear that inflammation (either acute or chronic) is a significant cause of malnutrition. Disease-related malnutrition is observed in multiple illnesses, and is the result of immune activation, changes in the hormonal milieu and alterations of the central and autonomic nervous systems. These acute responses have only been partially studied, but are characterized by hyperglycemia and insulin resistance, increased metabolic activity and an increase in muscle destruction and utilization of amino acids to generate glucose (gluconeogenesis). Inflammatory responses hasten the progression towards malnutrition [6].

Attempts at curtailing inflammation-related malnutrition were initially focused on providing larger amounts of energy beyond normal required caloric goals, mostly in the form of glucose and lipids. To support these attempts, nutrition intervention strategies included the use of ‘hyperalimentation’ through both parenteral and enteral routes. There is no evidence however, that strategies aimed at provision of large amounts of energy above normal needs curtails the catabolic response, or is of any physiological benefit. On the contrary, with few exceptions (such as seen in burns) the practice of providing large amounts of energy is associated with worsening of outcomes and should be abandoned.

The best treatment available at preventing inflammation-related malnutrition is that of controlling the inflammatory response. This is best done by adequately managing the disease and the prevention of subsequent complications such as infections. Limiting the amount of tissue damage during surgery, resecting necrotic tissues, draining abscesses and adequate pain control with the use of multimodality therapy are central to the prevention of disease-related malnutrition. Attempts at controlling the neurohormonal responses are difficult, but have met with some limited success under strict circumstances. Such is the case of the use of beta adrenergic blockade in burn patients.

Advances in nutritional sciences have led to the identification that certain nutrients exhibit ‘pharmacologic’ properties and modulate immune responses. Immunonutrition, as this specialized area of nutrition intervention is called, offers exciting and important possibilities. Some nutrients that are currently being utilized include amino acids such as arginine and glutamine, certain lipids such as omega-3 fatty acids, micronutrients such as vitamin C and nucleotides. The use of these different nutrients is beyond the scope of this article and the reader is urged to consult other texts [7].
The application of the scientific method in medicine has used two traditional approaches to successfully develop new treatments. The first uses basic sciences aimed at testing mechanistic hypotheses (i.e. how it works); the second uses clinical research aimed at determining the effectiveness of a specific treatment (i.e. whether it works). Clinical research generates the evidence of clinically relevant benefit through the performance of randomized trials, which are often summarized through meta-analyses. The use of these ‘evidence-based’ treatments is in turn encouraged through the creation of guidelines protocols and recommendations, many of them supported by professional organizations [8].

The fact that a specific treatment generates clinical benefit, however, does not guarantee widespread adoption by clinicians. In fact, a highly significant concern for all is the realization that adoption of new high-quality knowledge into daily clinical practice may be frustratingly slow. As a result, the benefits of modern medicine may fail to reach many patients. Examples of this abound. Hand washing is only routinely used by a proportion of physicians despite the fact that it evidently decreases nosocomial infections. Elevating the head of the bed in critically ill patients improves outcomes, though again and again practices and institutions fail to adopt these practices. In addition to the obvious negative effects on outcome, failing to improve the quality of care through adoption of scientifically proven effective therapies imposes dramatic increases in cost, which are intolerable in an already taxed health care system [9].

Quality practice improvement is the name given to the discipline aimed at hastening the adoption of effective therapies into daily clinical use. Quality practice improvement draws knowledge from many areas including engineering, social sciences, psychology and others. Industry has for many years understood the importance of quality control and the adoption of careful monitoring of assembly processes. The airline industry has established rigorous quality processes to create a safe mode of transportation. Recently, the government, third party payers and professional organizations have embraced quality practice improvement as a method to reduce medical errors, improve outcomes and decrease cost (http://www.ahrq.gov/).

The management of dysphagia requires careful coordination of multidisciplinary teams, rigorous adherence to protocols and support by institutions, and recognition of their cost-effectiveness by third party payers and government. Adequate nutrition intervention is essential for outcome improvement; as explained above, however, it is difficult for a primary health care team to provide for this care. Quality practice improvement in nutrition could help solve the complexity of nutrition delivery to the bedside in patients with dysphagia.

Nutrition intervention in dysphagia requires a long-term continuum of care. Multiple nutrition-related decisions have to be made during the hospitalization
and recovery of the patient and eventual return to an independent living. Take the stroke patient, for example. Acute interventions demand airway protection, endotracheal intubation and ventilation if necessary, hemodynamic stabilization, and complex procedures such as angiograms and placement of intravascular stents. During traditional patient care, nutrition intervention is discussed and adopted by the primary team. A decision to allow oral nutrition intake or place a feeding tube has to be made by the primary team [10]. Consultation
to a speech pathologist who is not part of the primary team may be required and a decision to initiate nutrition intervention is often delayed until the capacity to swallow is assessed by the consulting service. Nutrition intervention is then started and monitored by the intensive care service. A new primary team receives the patient to a regular floor once he/she leaves the intensive care unit. Nutrition requirements will change for this patient, and decisions of route of intake (oral, enteral, parenteral) will be required. Interventions such as the need for placement of gastrostomies for the provision of long-term enteral nutrition need to be made. The next step in this theoretical patient’s journey may require the admission to a skilled nursing facility or to a rehabilitation service where once again, a different nutrition intervention plan will need to be designed and instituted. Finally, the patient will hopefully be able to return home. At home, adequate provision of nutrition will be expected from the patient or his/her family. For example, will the patient require modification of the consistency of liquids and meals? Who and how is hydration going to be monitored? Is the patient taking in enough calories?

The exercise above demonstrates the complexity of providing adequate nutrition assessment and intervention in a patient with dysphagia is quite complex with multiple ‘intervention points’ and a complex ‘flow’ of information. Multiple delays and errors in intervention can occur. Quality improvement can significantly improve the quality of intervention and avoid errors. Quality improvement would dictate that a nutrition intervention team would be in charge of all the nutrition-related care of the patient once notified by the primary team upon arrival of the patient. The use of a nutrition team allows for measuring compliance with early nutrition assessments and intervention, seamless transitions through hospitalization, rehabilitation and return to home, detection of any nutrition-related complications and monitoring the cost of nutrition-related health care.

Quality practice improvement has shown significant benefits for the patients and decreased cost for the health care system. Infection rates have significantly decreased in intensive care units that systematically use sterile procedures and careful antibiotic management under the supervision of an infection prevention team. Improved outcomes are observed in surgical practices, showing decreased needs for reintervention and readmissions. Quality practice improvement in nutrition should lead to further improvement in the care of the dysphagia patient [10].

**Conclusions**

Dysphagia is a poorly recognized symptom that affects multiple patient populations and increases health care costs. Among the negative consequences of dysphagia is the progression towards malnutrition, which in turn
worsens prognosis. Nutrition assessment and intervention should be started early and continued throughout the care of the patient and his/her progression towards independence. Early identification of dysphagia should lead to the design of the most appropriate nutrition intervention regimens for the patient and the prevention of progression towards malnutrition increasing the patient’s chances for an uneventful recovery and decreasing health care costs.

References
