

Managing dysphagia in intensive critical units. Review

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Abstract:

In a prospective observational study, we evaluated swallowing disorders in the ICU, causes, highlighted the diagnosis and management methods. Electronic databases; MEDLINE, EMBASE and The Cochrane Library databases were searched up to December, 2017 to identify relevant studies discussing the dysphagia in intensive critical units, using following Mesh terms: "dysphagia" OR "ICU" Combined with "management" OR "treatment". Dysphagia is frequent among patients with critical illness polyneuropathy treated in the ICU. Old age, chronic obstructive pulmonary illness, the setting of mechanical ventilation, the prevalence of tracheal tubes, and behavioral "learned nonuse" could all be contributing factors for the advancement of dysphagia in critical disease polyneuropathy. Total healing takes place in a high percent of affected people within 4 weeks. Who should be screened for dysphagia after extubation? What is the ideal screening test? How can we limit the development of dysphagia? How do we treat it? Given the vast variety of patients who need intensive care, and an enhancing ICU mortality, determining the appropriate answers to these questions is essential. Additionally, swallowing

problems include multiple organ systems and affect elements of both acute and chronic care. As a result, advancements in our understanding of these problems will certainly need effective collaboration in between nurses, speech pathologists, neurologists, otolaryngologists, gastroenterologists, intensivists, and primary care doctors.

Introduction:

Dysphagia is a severe medical problem that could lead to aspiration pneumonia, malnutrition, and dehydration [1]. Dysphagia is the outcome of a variety of medical etiologies, including stroke, traumatic brain injury, modern neurologic conditions, head and neck cancers, and general deconditioning. Prevalence estimates for dysphagia differ depending upon the etiology and patient age, yet estimates as high as 38% for lifetime frequency have been reported in those over age 65 [2].

Swallowing disorder is a regular finding in critically sick patients dealt with in intensive care units (ICUs) [3], and persistent dysphagia after extubation is associated with a boosted risk for hospital-associated pneumonia, reintubation, and fatality in this population. However, the duty of long-lasting dysphagia in survivors of crucial illness is not well explored [4]. ICU survivors report a large range of physical, cognitive and mental impairments, which had been summarized as PICS (Post-Intensive Care Syndrome) by a recent stakeholders' seminar [4]. Swallowing disorder in acute and protracted vital illness has been determined as an essential study location as a result of its unfavorable impact on patient result [5].

The incidence of serious sepsis as a major reason for crucial disease continuously boost [6], and lowering fatality rates result in higher rates of survivors connected with lasting morbidity and

mortality [6].The definition of acute and long-term dysphagia and its payment to the disease worry of crucial health problem have not yet been explored. Furthermore, it is unknown if extreme blood poisoning itself has an intrinsic impact on the swallowing function.

In a prospective observational study, we evaluated swallowing disorders in the ICU, causes, highlighted the diagnosis and management methods.

Methodology:

Electronic databases; MEDLINE, EMBASE and The Cochrane Library databases were searched up to December, 2017 to identify relevant studies discussing the dysphagia in intensive critical units, using following Mesh terms: “dysphagia” OR “ICU” Combined with “management” OR “treatment”. In addition, the reference lists of identified articles were searched for more relevant studies to be involve in our review. Restriction language was applied to English published articles with human subject.

Discussion:

- **SWALLOWING DISORDERS IN THE ICU**

Definitions

Disordered swallowing typically refers to several pathophysiologic processes: dysphagia, gastroesophageal reflux, and aspiration. "Dysphagia" denotes any condition swallowing taking place from the mouth en route to the tummy. On the other hand, "gastroesophageal reflux" generally refers to the retrograde passage of any type of gastric components to the level of the

throat. Both dysphagia and gastroesophageal reflux can cause "aspiration," specified as the passage of food, liquids, or pills via the vocal cables into the trachea. Generally, signs and symptoms of disordered swallowing in patients with intact sensory input consist of pain or coughing while swallowing, the experience of food getting embeded the throat, a hoarse or wet voice after consuming, or the sensation of regurgitation. Relying on the underlying disease process and the phase of swallowing influenced, patients in the ICU that create ingesting conditions might or might absent with regular signs or symptoms. Imaging methods often expose obvious aspiration in hospitalized patients who lack any one of these presenting clues. This sort of desire is commonly described as "silent" and is estimated to take place in over 50% of all patients with documented aspiration [7], [8], [9].

Dysphagia that happens in ICU patients following extubation, typically described "postextubation dysphagia" (or PED), usually is an ICU-acquired problem. Nevertheless, due to the fact that swallowing illness in the general population could offer insidiously, and have differed diagnostic standards, it is likewise possible for vital disease to unmask a previously undiagnosed swallowing disease. It is likewise possible that the primary reason for a patient's admission is a recognized cause of irregular ingesting, irrespective of the existence of an endotracheal tube or systemic disease (such as an acute hemispheric cerebrovascular accident or a huge laryngeal abscess). While essential care medical professionals clearly should make feeding choices for these patients, this evaluation concentrates mainly on the downstream swallowing problems suffered by patients who either got an endotracheal tube, mechanical ventilation, or came to be afflicted by a systemic important disease.

The occurrence of swallowing problems in a populace of extubated acute respiratory system failure survivors is unidentified, mainly since existing epidemiologic research studies have innate

prejudices, have used variable testing and analysis standards, and have examined heterogenous patient populaces. Relying on the populace studied and the diagnostic standards utilized, the estimated frequency of dysphagia arrays in between 3% and 62% for patients recouping from essential health problems [10], [11]. Further well-controlled prospective research studies making use of standardized diagnostic criteria will certainly be essential to figure out the true prevalence of dysphagia in vital illness survivors.

Dysphagia can be classified into 4 groups, based on the area of the swallowing disability: oropharyngeal, esophageal, esophagogastric, and paraesophageal.

Table 1. Causes of Dysphagia [12].

| | Motor | Physical obstruction |
|-----------------|--|---|
| Oropharyngeal | Upper esophageal sphincter dysfunction Cerebrovascular disease Parkinson's disease Peripheral neuropathy Myasthenia gravis Myopathy | Oropharyngeal carcinoma Congenital web Zenker's diverticulum |
| Esophageal | Diffuse esophageal spasm Achalasia Vigorous achalasia Scleroderma Diabetes mellitus | Esophageal carcinoma Reflux esophagitis Peptic stricture Schatski ring |
| Esophagogastric | Achalasia | Gastric carcinoma Stricture |
| Paraesophageal | | Thyromegaly Cervical spine disease Left atrial enlargement Postsurgical scarring Lymphadenopathy (mediastinal or cervical) |

- **Mechanisms**

Patients in the ICU can develop inefficient ingesting through six possible systems. First, endotracheal and tracheostomy tubes themselves could cause straight injury to typical structural structures that make it possible for effective swallowing and protect against aspiration. Most significantly, focal ulcer and/ or inflammation could harm the vocal cables, the epiglottis, the arytenoids, and/or the base of the tongue, making these structures less with the ability of safeguarding the airway. This inflammation can either result in granulation tissue or perhaps the scarring with each other of the singing cords, known as "synechiae" [13]. This granulation tissue and scarring could cause dysphagia, desire, a modified voice, or in rarer celebrations an endangered airway calling for emerging medical improvement. In addition, arytenoid dislocation and subluxation can lead to damaged glottic closure throughout ingesting [14]. Furthermore, the reoccurring laryngeal nerve can be compressed (normally by the endotracheal tube cuff) resulting in singing cord paresis and paralysis. Lip and dental injuries received throughout the duration of intubation have the prospective to influence a patient's ability to hold food in the mouth and/or eat properly, which could influence bolus size, and ingest timing, resulting in desire. Similarly, tongue swelling, or macroglossia, could take place following malpositioned bite blocks. Lingual nerve compression and loss of tongue experience have been reported after powerful laryngoscopy or a poorly placed laryngeal mask apparatus. Finally, other by mouth inserted international bodies, such as larger bore orogastric tubes, transesophageal echocardiogram probes, and suction devices, might also create direct oral, pharyngeal, laryngeal, or esophageal injury that could hinder succeeding swallowing [15].

The second mechanism for dysphagia in critically unwell patients is neuromyopathy leading to muscle weak point. Several muscle teams called for from typical ingesting could be impacted. For example, infrequent swallowing can result in a disuse atrophy of the muscular tissues of the

tongue, pharynx, and larynx in patients getting long term endotracheal intubation or paralytics [16]. In addition, vital ailment polyneuromyopathy is a common peripheral muscular problem and could cause diminished total coughing toughness and restricted glottic clearance [17].

The 3rd device for dysphagia is the growth of inefficient oropharyngeal and laryngeal experience. Sensation abnormalities could result from either essential illness polyneuropathy or regional edema. While laryngeal sensation assessment techniques are presently being maximized to evaluate patients, the appropriate timing and stamina of the laryngeal closure response relies on proper afferent input and most likely plays a role in the pathophysiology of swallowing dysfunction [18].

The 4th mechanism for swallowing dysfunction in critical disease survivors is impaired sensorium, either related to ICU-acquired ecstasy, underlying crucial disease, or the results of sedating drugs. Leder et alia [19] have recently reported that in a blended patient populace, the chances of liquid aspiration were 31% better for patients not oriented to person, place, and time. Reduced level of consciousness additionally limits a patient's capability to take part totally in therapeutic exercises offered by speech-language pathologists. Additional controlled researches are necessary to identify the period and magnitude of the effect of a transformed sensorium on ingesting function in critically sick patients.

The 5th mechanism for disordered swallowing in seriously ill patients is gastroesophageal reflux. Supine positioning, higher levels of sedation, and making use of paralytics are all reported danger factors for gastroesophageal reflux and subsequent aspiration in intubated ICU patients. Although not straight investigated, a few of these pathophysiologic procedures that are responsible for gastroesophageal reflux most likely proceed in the instant postextubation period. Damaged gastric mobility and tube-based enteral feeding additionally raise the danger for gastroesophageal

reflux. Despite debate surrounding optimal volume thresholds, gastric residual quantity is frequently used in tube-fed patients to monitor for damaged gastric mobility and the danger of succeeding reflux and aspiration [20].

The sixth mechanism for swallowing disorder is dyssynchronous breathing and swallowing in patients with underlying respiratory problems and tachypnea. Prevention of aspiration during swallowing is dependent on specific coordination in between laryngeal closure, apnea, and the opening of the upper esophageal sphincter [21]. As the respiratory rate boosts, the periswallowing apneic duration reduces, and laryngeal opening could occur prior to flow of the food bolus into the esophagus. Patients with hypoxemia and tachypnea aspirate extra often. Additionally, these patients have much less physiologic book to suit aspiration-associated gas exchange problems, which better enhance the deleterious impacts of their aspiration.

- **Screening**

Although screening for dysphagia in all stroke patients is a component of the present national standards and efficiency measures, no comparable criteria exist for the examination of seriously unwell patients complying with extubation [22]. A current nationwide study of inpatient speech-language pathologists that concentrate on the assessment and management of swallowing conditions disclosed that just 41% of health centers regularly evaluate extubated patients for dysphagia [23]. Almost all screening methods include the tried swallowing of an amount of water varying between 3mL and 90mL, adhered to by the observation by either a registered nurse, speech-language pathologist, or doctor for clinical signs of aspiration. The integrity and validity of these testing methods have been debated in stroke patients, greatly as a result of suspicious sensitivity for aspiration. Nevertheless, in a recent, large research of a combined group of hospitalized patients, Suiter and Leder [24] showed that a 3-ounce Water Swallow Test was

96.5% delicate and 48.7% certain for desire as discovered by a bedside endoscopy executed promptly later. Although these outcomes suggest a possible method to screen patients following extubation, the validity of this and various other water-based screening methods in just recently extubated patients is unknown.

- **Diagnosis**

Currently, the most common diagnostic examination to examine for PED is a bedside swallow analysis performed by a speechlanguage pathologist. Although the parts of this exam are not standardized and could differ by practitioner [23], patients normally undertake a meeting, an architectural and practical examination of their mouth and their cough action, and an evaluation of swallowing function with different food appearances and fluid thicknesses. The bedside swallow evaluation has been criticized for inadequate sensitivity in addition to poor inter- and intrajudge integrity. Although it has not been verified versus gold common examinations, a seven-point range that integrates the regarded goal danger and subsequent dietary suggestions is frequently utilized to quality the seriousness of dysphagia [25].

Although the bedside swallow analysis is the single evaluation carried out in 60% of situations nationwide [23], additional examinations might be ordered to assist in the diagnosis of PED. A videofluoroscopic swallow research (VFSS), frequently described as "a customized barium swallow," is readily available in over 97% of hospitals nationwide [23]. To do this examination, patients are delivered from the ICU to a fluoroscopy suite and instructed to swallow different consistencies of barium-containing foods and fluids in a sitting placement. The treatment is tape-recorded then reviewed by a radiologist. Despite questionable interobserver variability for abnormalities in various other phases of swallowing, this examination is extremely sensitive and particular for aspiration [28]. Numerous scoring systems exist to measure the level of aspiration as

well as the level of general swallowing impairment. Importantly, imagined aspiration on a VFSS has been related to considerably raised risk of establishing succeeding pneumonia in a mixed group of patients [26].

The other gold common instrumental procedure to examine for PED is a fiberoptic endoscopic swallow study (FEES). Throughout this examination, a small (generally 3.4- 3.6 mm) nasopharyngoscope is gone through one nostril into the pharynx, and the entire glottis is endoscopically imagined during swallowing. Patients often receive a small quantity of a local anesthetic to the nasal turbinates to optimize comfort. Both the interobserver irregularity and the level of sensitivity for discovery of aspiration are slightly better for the FEES than for a changed barium swallow [27]. A significant benefit of the FEES in ICU patients is the capability to perform the examination at the patient's bedside. Other advantages consist of the ability to imagine injury to laryngeal soft tissues, observe secretion management, and test laryngeal experience directly. In a population of acute stroke patients, FEES has been reported to predict both the advancement of pneumonia and the degree of reliant living at 3 months [29]. An across the country example of evaluated speech pathologists disclosed that FEES is much less often offered than a customized barium swallow or even when offered is utilized less frequently [23].

- **Treatment**

Treatments for all kinds of dysphagia have been fairly underexplored, specifically for patients recuperating from critical illnesses. Based on the proof mostly acquired in noncritically sick patients with chronic neuromuscular disease, the present state of therapy includes dietary structure adjustment, postural modification, therapeutic exercises, and/or enteral feeding tubes [30]. In uncommon instances, surgical strategy such as an upper esophageal sphincter myotomy has been executed, with variable results. The aim of the myotomy is to minimize the resistance of

a functionally obstructing top esophageal sphincter to promote the motion of the food bolus from the pharynx into the cervical esophagus. No controlled trials have shown solid benefits of any kind of methods defined above, and speech-language pathologists and surgeons vary in their use of, and regarded performance, various treatments [23]. Given the potentially reversible sensory and neuromotor devices for PED, unique therapeutic workout methods might be useful. For instance, surface electromyography biofeedback has just recently been integrated into a rehabilitation program with very early success [31]. This technology allows patients to visually check their very own muscle activity throughout the swallowing procedure. Additionally, packed exercise programs for both outpatients and acute stroke patients have revealed encouraging cause small trials and deserve further study in vital ailment survivors [32]. Preliminary proof likewise suggests a benefit in outpatients with other straight therapy techniques such as neuromuscular electric excitement or cricopharyngeal botulinum toxin injection [33].

Conclusion:

Dysphagia is frequent among patients with critical illness polyneuropathy treated in the ICU. Old age, chronic obstructive pulmonary illness, the setting of mechanical ventilation, the prevalence of tracheal tubes, and behavioral "learned nonuse" could all be contributing factors for the advancement of dysphagia in critical disease polyneuropathy. Total healing takes place in a high percent of affected people within 4 weeks. Who should be screened for dysphagia after extubation? What is the ideal screening test? How can we limit the development of dysphagia? How do we treat it? Given the vast variety of patients who need intensive care, and an enhancing ICU mortality, determining the appropriate answers to these questions is essential. Additionally, swallowing problems include multiple organ systems and affect elements of both acute and chronic care. As a result, advancements in our understanding of these problems will certainly

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