

Bedside Assessment of Dysphagia: A Retrospective Study at a Tertiary Care Hospital in Nepal

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Abstract

The bedside assessment of dysphagia is a crucial method for gaining essential insights into a patient's ability to swallow. This evaluation involves a thorough examination of the patient's medical and swallowing history, a detailed assessment of the anatomy of the mouth, throat, and voice box, and an evaluation of sensory and motor functions, behavior, cognitive abilities, and language skills, along with trying different foods and fluids. Despite being in the early stages of development in Nepal, addressing and treating swallowing disorders are vital efforts. The aim of this study is to document the data obtained from the bedside assessment of dysphagia, using a protocol developed at TUTH. Conducted retrospectively at a tertiary care facility, the evaluation included comprehensive history-taking and trials with food and fluids, along with the use of standardized outcome measures such as the FOIS and RBHOMRS. The results show that 114 out of 121 patients had varying degrees of dysphagia. Therefore, the bedside assessment protocol emerges as a reliable tool for evaluating dysphagia, especially in regions like Nepal where instrumental assessments for swallowing are not yet widely available.

Keywords: Dysphagia, Bedside evaluation, Swallowing, Deglutition, Speech-Language Pathologist

Introduction

Dysphagia, characterized by difficulty in swallowing, often stems from either structural or neuromuscular issues affecting the oro-pharynx or esophagus. Following a stroke, dysphagia is a prevalent concern, with estimates ranging from 22% to 78% depending on various factors such as the underlying cause and timing post-stroke(O'Horo et al., 2015; Sk et al., 2000). This condition significantly contributes to complications like aspiration pneumonia, malnutrition, dehydration, heightened mortality rates, and prolonged hospital stays. Identifying and addressing dysphagia early on is crucial to mitigate the risk of pneumonia, reduce hospitalization duration, and enhance cost-effectiveness by minimizing the need for prolonged medical care.

Nepal, a small and developing country in South Asia, is still in the early stages of understanding swallowing disorders and dysphagia. A survey on the awareness of role of Speech-Language Pathologists (SLPs) for managing dysphagia among medical professionals in Nepal revealed a significant lack of awareness. Approximately 78.4% of professionals admitted to rarely referring patients with dysphagia to SLPs (Dawadee et al., 2017). Similarly, nurses working in tertiary care hospitals in Nepal displayed only a moderate level (62.39%) of knowledge about dysphagia(Nepal & Sherpa, 2019) . The lack of research on the incidence and prevalence of dysphagia in Nepal may be attributed to a shortage of professionals interested in dysphagia field or the aforementioned lack of awareness. However, globally, the community prevalence of dysphagia ranges from 2% to 20%(Adkins et al., 2020)

In Nepal, between 2013 and 2015, lip and oral cavity cancer ranked sixth among the most common types of cancer, while larynx cancer ranked eighth. Interestingly, for males, lip and oral cavity cancer ranked second (Shrestha et al., 2020). A health services annual report from 2018 revealed that there were 866 patients diagnosed with head and neck cancer between 2016 and 2017. Although there is no specific data available on the prevalence of swallowing difficulties among head and neck cancer patients in Nepal, numerous global studies have been conducted. Approximately 50.6% of head and neck cancer patients experience oropharyngeal dysphagia. Among patients who undergo glossectomy, 72.4% encounter problems with solid food, and those who undergo chemotherapy exhibit the highest rate of dysphagia (García-Peris et al., 2007).

Following chemo-radiation treatment for head and neck cancer, the incidence of aspiration can be as high as 68% (Eisbruch et al., 2002). However, not all patients who aspirate develop pneumonia; the reported incidence of aspirated pneumonia is around 14.54% (Nguyen et al., 2004). It was also found that 25.4% of head and neck cancer patients developed pneumonia after chemo-radiation, which adversely affected their treatment responses and survival rates (Shirasu et al., 2020). Between 2014 and 2015, a study conducted in a tertiary care center of Nepal highlighted cerebrovascular diseases as the most prevalent issue faced by neurologists, accounting for 43.40% of cases. Following closely were seizures, infections, and degenerative conditions (Pokharel & Amatya, 2019).

Stroke emerged as a significant cause of mortality in Nepal, ranking among the top five according to disability-adjusted life years (Shaik et al., 2012). Dysphagia, affecting 27% of self-sufficient elderly individuals and 47.4% of those in intensive care units requiring assistance, poses a considerable challenge. Moreover, dysphagia's prevalence varies across different conditions: it ranges from 13% to 15% among inpatients with dementia, 19% to 80% among those with Parkinson's disease, and 44% to 60% among individuals with neurodegenerative diseases (Ershov, 2021). Among stroke patients, dysphagia occurs in approximately 25% to 65% of cases, with a mortality rate of 20% to 24% among tube-fed patients (Jones et al., 2020).

Complications of dysphagia extend beyond mortality, with up to one-third of stroke patients experiencing pneumonia, and a 700% increased risk of aspiration pneumonia due to dysphagia (Altman et al., 2013; Sellars et al., 2007). Malnutrition affects 16.2% of dysphagia patients, while 49.7% experience dehydration (Mozzanica et al., 2018). Notably, mortality rates are higher in the dysphagia group compared to the non-dysphagia group (Feng et al., 2019). For children, data on the incidence and prevalence of swallowing issues are lacking, although malnutrition and pneumonia have been reported without clear etiology. Pneumonia ranks among the major illnesses affecting children aged 2 to 59 months (DoHs, 2015/2016).

Various swallowing evaluation protocols are practiced globally, categorized into instrumental and non-instrumental methods. Clinical bedside evaluation, a non-instrumental approach, encompasses medical and swallowing history, anatomical evaluation, sensory and motor function assessment, cognitive and language abilities evaluation, and trial feeding with various food consistencies. This method, with 42%-92% sensitivity and 59%-91% specificity, is

considered safe and easily repeatable (Mari et al., 1997; Ramsey et al., 2003). Adding on some of the patient reported outcome measures and clinician reported outcomes measures provides us more information on swallowing status of the patients. However, instrumental evaluations like Fiberoptic Endoscopic Evaluation of Swallowing (FEES) and Video Fluoroscopic Swallow Study (VFSS) offer comprehensive insights into anatomical and physiological aspects of swallowing and are considered as gold standard for swallowing assessment.

One of the major roles of speech language pathologists is identifying patients with swallowing problems and providing intervention. They perform various types of assessments including bedside evaluation, clinical evaluation, screening and instrumental evaluation to determine the dysphagia. In Nepal, while some speech-language pathologists practice dysphagia assessment and management, standardized protocols and guidelines are lacking, underscoring the need for their development and implementation, also it has been very difficult to note instrumental practice. Despite the high risk of aspiration-related complications, there is a dearth of literature emphasizing the necessity of professional assessment and management of dysphagia in both adults and children. So, this is the one of the primitive studies documenting the bedside evaluation of dysphagia (non-instrumental) and highlighting the importance of standard protocol for dysphagia service in context of Nepal.

Methods

This retrospective descriptive study examines 121 dysphagia patients admitted to both the Ear, Nose, and Throat (ENT) department and Neurology department at Tribhuvan University Teaching Hospital (TUTH). These patients were referred to Speech-Language Pathologists by nurses, doctors, and residents, following a protocol established during in-house training. The professionals were trained to identify the difficulty of swallowing based on symptoms exhibited by the patient and a referral system was built. The protocol entails a comprehensive assessment, including demographic information, medical history, speech and communication status, Cranial nerve examination, current condition and food/fluid intake status.

Each patient underwent a trial to determine suitability for food/fluid trials during bedside evaluations. Subsequently, various consistencies were introduced in a hierarchical manner, conforming to levels 4, 5, 6, and 7 for solids and level 0 for liquids, adhering to the classification of the International Dysphagia Diet Standardization Initiative (IDDSI), given the unavailability of thickeners in Nepal.

Upon completion of the fluid/food trial, the severity of dysphagia was perceptually graded by clinicians based on their expertise and knowledge. The Parramatta Hospital's Assessment of Dysphagia (Warms et al., 1991) served as a reference for classification. Furthermore, the status of swallowing was assessed using various clinician-based outcome measures such as the Royal Brisbane Hospital Outcome Measures Rating Scale for Swallowing (RBHOMRS)(Ward & Conroy, 1999) and the Functional Oral Intake Scale (FOIS) (Crary et al., 2005). In-patient case history form was developed to document the patient related history and week chart was maintained for better follow up. The collected information/data underwent thorough scrutiny and were subjected to descriptive analysis employing SPSS 23.

Result

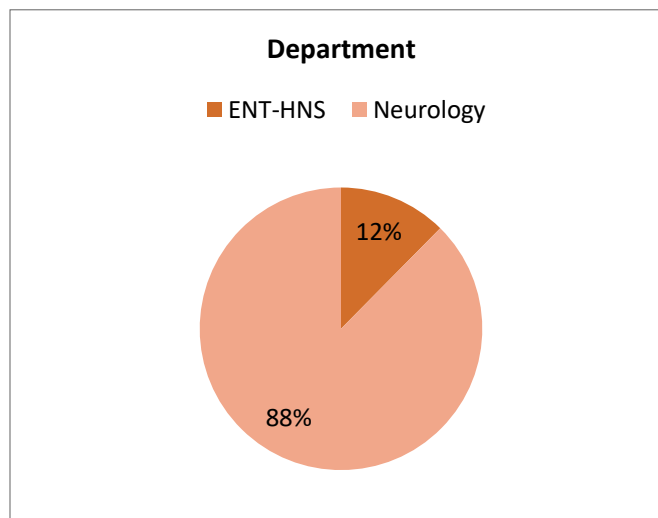
A total of 121 patients, 54 of whom were female and 67 of whom were male, were included in this investigation. The cohort was categorized into six age groups. The predominant age bracket was 40-60 years, comprising 40 individuals, followed by those above 70 years and 60-75 years, with 28 and 27 patients respectively. Conversely, the age group 15-30 exhibited the fewest patients, numbering only 9. The highest incidence of dysphagia among males occurred in the 45-60 age range, while for females it was observed in those above 75, closely followed by the 45-60 age group.

| | Gender | | Total | |
|-----|--------|--------|-------|----|
| | Male | Female | | |
| Age | | | | |
| | 15-30 | 6 | 3 | 9 |
| | 30-45 | 9 | 8 | 17 |
| | 45-60 | 25 | 15 | 40 |
| | 60-75 | 15 | 12 | 27 |

| | | | |
|----------|----|----|-----|
| above 75 | 12 | 16 | 28 |
| Total | 67 | 54 | 121 |

Table 1. Gender distribution among various age groups

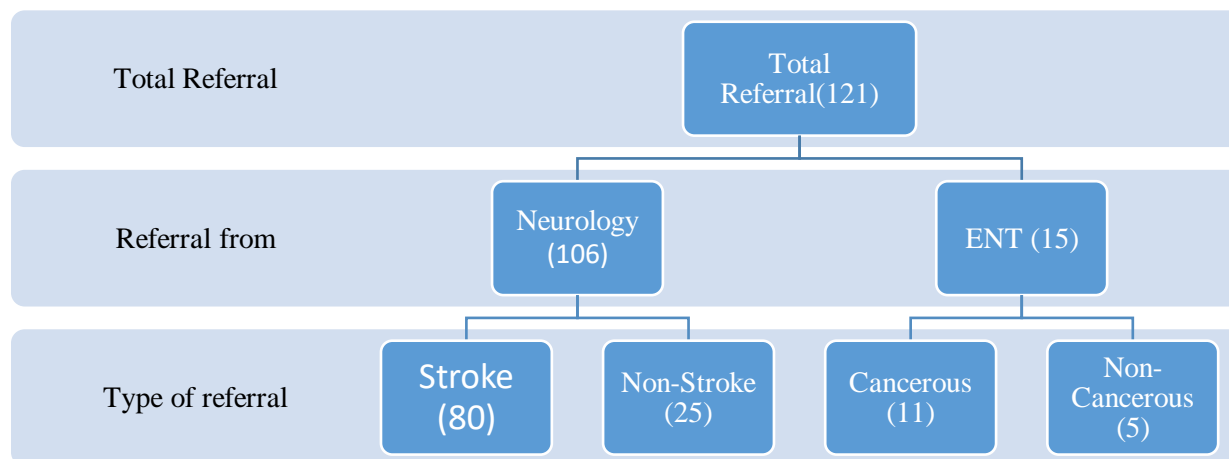
The majority of patients were referred from the Neurology Department, with a smaller proportion coming from the ENT-HNS Department. Specifically, 87.6% (n=106) of patients originated from the Neurology Department, while 12.4% (n=15) were referred from the ENT-HNS Department.



Graph 1. Percentage of patient referred from different department

The neurology department received referrals encompassing a spectrum of disorders, including cortical and subcortical strokes, brainstem involvement, Guillain-Barré Syndrome (GBS), meningitis, encephalitis, Parkinson’s disease, dementia, osmotic demyelination syndrome, amyotrophic lateral sclerosis (ALS), and hypoxic brain injury. These were classified into stroke-related and non-stroke-related cases. Notably, 20.7% (n=25) of the referrals pertained to non-stroke patients. Among the stroke cases, of the total 80 incidents, 72.5% were diagnosed as ischemic strokes while 27.5% were identified as hemorrhagic strokes.

Similarly, the Ear, Nose, and Throat-Head and Neck Surgery (ENT-HNS) department received referrals primarily concerning carcinoma of various head and neck regions (pharynx, oral cavity, epiglottis, larynx, and nasal cavity), suicidal lacerations to the throat, and necrotizing fasciitis. These referrals were distinguished between cancerous and non-cancerous conditions. Of these, 9.1% (n=11) were related to cancerous cases, while 4.1% (n=5) were associated with non-cancerous conditions.



Flowchart 1. Demonstrating referral

During the course of the trial, it was noted that among the total patient cohort, 7 individuals declined participation in the fluid/food trial, while 16 patients were deemed appropriate candidates for NPO (nil per os) recommendation. Additionally, 7 patients exhibited completely normal swallowing functions. Upon further examination, it was found that 8 patients presented with mild oro-pharyngeal dysphagia, while 4 patients exhibited mild oral dysphagia, and an equal number displayed mild pharyngeal dysphagia. Furthermore, 2 patients demonstrated mild-moderate oral dysphagia, whereas 12 individuals showcased mild-moderate oro-pharyngeal dysphagia, and 1 patient manifested mild-moderate pharyngeal dysphagia.

Diagnostic categorization revealed that 17 patients were diagnosed with moderate oro-pharyngeal dysphagia, while 3 patients were diagnosed with moderate oral dysphagia, and only 2 patients were diagnosed with moderate pharyngeal dysphagia. In the moderate-severe category, 15 patients exhibited oro-pharyngeal dysphagia, 2 patients displayed oral dysphagia, and 1 patient

was presented with pharyngeal dysphagia. Furthermore, a subset of patients fell into the severe category, with 18 individuals diagnosed with severe oro-pharyngeal dysphagia and 2 patients exhibiting severe pharyngeal dysphagia.

In summary, the prevalence rates indicate that 58.7% of patients experienced oro-pharyngeal dysphagia, while 13.2% and 7.4% of patients suffered from oral and pharyngeal dysphagia, respectively. Notably, no instances of esophageal dysphagia were identified or suspected during the assessment process.

| | Frequency | Percent |
|--|-----------|---------|
| Patient refused | 7 | 5.8 |
| Mild oro-pharyngeal Dysphagia | 8 | 6.6 |
| Mild Oral Dysphagia | 4 | 3.3 |
| Mild pharyngeal Dysphagia | 4 | 3.3 |
| Mild-Moderate oropharyngeal Dysphagia | 12 | 9.9 |
| Mild-Moderate Oral dysphagia | 2 | 1.7 |
| Mild-Moderate Pharyngeal Dysphagia | | |
| Moderate oro-pharyngeal dysphagia | 17 | 14.0 |
| Moderate Oral Dysphagia | 3 | 2.5 |
| Moderate Pharyngeal Dysphagia | 2 | 1.7 |
| Moderate-Severe oro-pharyngeal dysphagia | 15 | 12.4 |
| Moderate-Severe oral Dysphagia | 2 | 1.7 |
| Moderate-Severe pharyngeal Dysphagia | 1 | .8 |
| Severe Oro-pharyngeal Dysphagia | 18 | 14.9 |
| Severe Pharyngeal Dysphagia | 2 | 1.7 |
| Mild-Moderate Pharyngeal Dysphagia | 1 | .8 |
| NPO | 16 | 13.2 |
| Normal | 7 | 5.8 |
| Total | 121 | 100.0 |

Table 2. Number of patients with various degree of dysphagia

The study utilized outcome measures to quantify swallowing function among dysphagia patients, employing the Royal Brisbane Hospital Outcome Measure for Swallowing (RBHOMRS), a 10-point scale administered by clinicians. Notably, the majority of patients, comprising 33 individuals, were classified at level 4, indicating that they had initiated oral intake and could manage small quantities of both thickened and thin fluids, albeit with the assistance of

supplementation and nasogastric (NG) tube feeding for hydration and nutrition support. Moreover, 26 patients were categorized at level 5, signifying the introduction of modified dietary regimens or the continuation of previously tolerated consistencies, necessitating additional supplementation. Furthermore, 13 patients were situated at level 9, demonstrating their ability to maintain oral intake at pre-morbid levels.

| | | Frequency | Percent |
|---------|--|------------------|----------------|
| | Patient aspirates secretion | 2 | 1.7 |
| | Difficulty managing Secretions but protecting airway | 4 | 3.3 |
| | Coping with secretion | 10 | 8.3 |
| | Tolerates small amounts of thickened/ thin fluids only-needs supplementation | 33 | 27.3 |
| | Commencing/continuing Modified diet-needs supplementation | 26 | 21.5 |
| | Commencing/Continuing modified diet-without supplementation | 4 | 3.3 |
| | upgrading modified diet | 1 | .8 |
| | maintaining adequate oral intake at patients optimal level | 5 | 4.1 |
| | Maintaining adequate oral intake at premorbid/preadmission level | 13 | 10.7 |
| | Total | 98 | 81.0 |
| Missing | System | 23 | 19.0 |
| Total | | 121 | 100.0 |

Table 3. RBHOMRS score in patient with dysphagia

In the context of Functional Oral Intake Scale (FOIS) assessment, the predominant patient distribution was observed in level 2, indicative of a reliance on tubes for sustenance with minimal

or irregular oral intake. Subsequently, a substantial proportion, encompassing 25 patients, progressed to level 3, characterized by a consistent oral intake supplemented by tubes. Notably, a subset of 10 individuals attained level 7, signifying comprehensive oral intake across all consistencies without any restrictions.

| | Frequency | Percent |
|---|-----------|---------|
| No oral intake | 13 | 10.7 |
| Tube dependent with Minimal/inconsistent oral intake | 37 | 30.6 |
| Tube supplements with consistent oral intake | 25 | 20.7 |
| Total oral intake of multiple consistencies requiring special preparation | 7 | 5.8 |
| Total oral intake with no special preparation, but must avoid Specific food or liquid items | 6 | 5.0 |
| Total oral intake with no restrictions | 10 | 8.3 |
| Total | 98 | 81.0 |
| Missing System | 23 | 19.0 |
| Total | 121 | 100.0 |

Table 4. FOIS score of patients with swallowing difficulty

During the initial assessment, a predominant reliance on nasogastric (NG) tube feeding was noted among patients referred to Speech-Language Pathologists (SLPs), with 114 cases, while 11 patients were on oral feeding and 2 had percutaneous endoscopic gastrostomy (PEG) tubes. During service provision, various oral hygiene issues such as halitosis, oral ulcers, dry mouth, and oral thrush were frequently observed, necessitating specialized counseling and demonstration by healthcare professionals. Most referrals to SLP occurred when patients were nearing discharge

from the medical team, with some opting to leave against medical advice (LAMA), often due to financial constraints or cultural factors (A. Thapa et al., 2018; L. Thapa et al., 2013)

On average, patients received 3 assessment and treatment sessions during their hospitalization. Analysis revealed that patients were typically referred to SLPs 15 days after admission, with the longest delay being 91 days and the shortest occurring within a day. Moreover, the mean difference between referral and SLP consultation dates was 2.5 days. Upon discharge, approximately 85% of patients continued with NG tube insertion, while only 10-12% returned for outpatient follow-up. The fate of those who did not return remained unknown, leaving the status of their swallowing function untracked.

After the implementation of a dysphagia management protocol in the hospital, 9 referred patients exhibited normal or adequate swallowing function, while 119 patients presented with mild to severe oropharyngeal dysphagia. Notably, esophageal dysphagia was not ruled out during initial assessment. Given the nascent stage of service delivery, instrumental assessments were not yet conducted for any patients.

Discussion

The data indicates that the protocol devised for bedside assessment of dysphagia effectively identifies and categorizes swallowing-related issues among patients with neurological conditions as well as those with Head and Neck pathologies. Out of 121 patients examined, 114 were diagnosed with some degree of dysphagia using this protocol. Consequently, this bedside evaluation method emerges as a primary investigative approach when dysphagia is suspected. Furthermore, the inclusion of clinician-reported outcomes such as FOIS and RBHOMRS aids in objectively quantifying the patients' swallowing function.

This protocol represents a significant advancement in the field, offering a preliminary framework for bedside assessment of dysphagia. However, it currently lacks the incorporation of patient-reported outcome measures (PROM). Integrating such measures would provide invaluable insight into patients' subjective experiences regarding their swallowing difficulties.

Conclusion

Swallowing transcends mere sustenance and hydration in cultures like Nepal, where communal dining is woven into the fabric of social interaction. Thus, any impediment to

swallowing or feeding poses a direct threat to overall quality of life, affecting emotional, physical, functional, and social well-being. In the context of Nepal, where dysphagia services are nascent, the absence of standardized bedside assessment protocols exacerbates this challenge.

A protocol developed for dysphagia assessment in a tertiary care hospital in Nepal holds promise for wider application, not only within the country but also in similar resource-constrained settings globally. Its relevance extends to other developing nations grappling with the establishment of swallowing services amidst a backdrop of limited technological infrastructure and evidence-based practices. The significance of this protocol cannot be overstated, particularly in regions like Nepal where facilities for instrumental evaluation are limited or unavailable. By leveraging bedside evaluation, healthcare practitioners can effectively screen for and manage dysphagia, thereby enhancing patient care and outcomes.

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