Original Article

Informal And Formal Assessment Of Dysphagia Following Acute Stroke

Taniya Raj[1], Dr Turin Martina[2]*

[1]Senior Speech Language Pathologist, Dysphagia Specialist, PhD Research Scholar, Holy Cross College, Tiruchirappalli, India (Affiliated to Bharathidasan university, Thiruchirappalli, Tamil Nadu), Email: perumalataniya1985@yahoo.co.in
*[2]Associate Professor, Research Supervisor and HOD, Holy Cross College, Tiruchirappalli, India (Affiliated to Bharathidasan university, Thiruchirappalli, Tamil Nadu), Email: turinmartina@hcctrichy.ac.in

***Corresponding Author:** Dr Turin Martina

*[2]Associate Professor, Research Supervisor and HOD, Holy Cross College, Tiruchirappalli, India (Affiliated to Bharathidasan university, Thiruchirappalli, Tamil Nadu), Email: turinmartina@hcctrichy.ac.in
Doi : 10.47750/pnr.2022.13. S05.169

Abstract

Background: Swallowing are complex behaviours in which food passes from the mouth to stomach and during swallow airway protection happens minimizing food entering into lungs. In acute stage of stroke, dysphagia is found in up to 76% of patients and an increased mortality rate following aspiration is observed (Daniels & Brailey, 2009).

Method: The main objectives of the study were to identify specific signs and symptoms specific to type and site of brain infarcts with stroke. This is a prospective study done in an acute hospital. This study has a sample size of 222 patients, with age range 20 - 75 years. The methodology included direct bedside swallow assessment, use of The Mann Assessment of Swallowing Ability (MASA) and kinematic analysis of Video fluoroscopic Evaluation of Swallowing.

Results: The study showed that 55.9% of patients belonged to 51 to 70 years followed by 25.2% of patients belonging to 31-50 years.76.5% of patients had hemorrhagic stroke and 12.1% had ischemic strokes. On analyzing the symptoms exhibited by 222 patients following stroke 94.5% were dysarthria/slurred speech, 39.1% had aphasia, 58.1% had Right sided facial weakness, 26.5% had Left sided facial weakness. On administering Mann Assessment of Swallowing Ability (MASA) 31.9% of study patients had no dysphagia. 25.2% of patients had Mild dysphagia with mild aspiration risk. 2.2% of patients had Moderate dysphagia with mild aspiration risk. PAS score parameters were significantly (0.040) associated MASA score parameters. The VFSS parameters mainly tongue control (p=0.044; phi=0.494), laryngeal closure (p=0.050; phi=0.424), Initiation of Pharyngeal Swallow (p=0.095; phi=0.296), laryngeal elevation (p=0.027; phi=0.197), Epigiottic Movement (p=0.093; phi=0.339), Tongue Bolus Retraction (p=0.045; phi=0.295), and pharyngeal residue (p=0.055; phi-0.239) were significantly associated with site of infarct in addition to mild intensity of association.

Conclusion: In conclusion, identification of patients at risk of aspiration or having oropharyngeal dysphagia is crucial in the acute stroke management, early rehabilitation can improve the outcome.

INTRODUCTION:

Swallowing or deglutition is a complicated neuromuscular activity whereby food is transferred from the mouth to the stomach. The act of swallowing requires the coordination of cranial nerves, the brain stem, cerebral cortex and 26 muscles of the mouth, pharynx and esophagus. The main cranial nerves that help in swallowing include the trigeminal, facial, glosso-pharyngeal, vagus and hypoglossal nerves. Neural networks that are responsible for this automatic swallowing are coordinated in the Medulla oblongata. Swallowing are complex behaviors which includes two crucial features: passage of food from the mouth to the stomach and protecting airway during swallow trigger.

A stroke is a condition in which patient rapidly losses brain function due to interruption in the blood supply to the brain structures (Donnan, 2008).Following stroke patients have abnormal swallowing affecting their oral and pharyngeal phase of swallowing which is dependent on the type and site of brain infarct. In light to this its number of available studies on bedside swallow assessments and on instrumental swallow studies to identify specific swallowing difficulties following different types and different site of brain infarct is limited thereby urge its importance in the research field.

NEED OF THE STUDY

Identifying patient's swallowing impairment is essential for Speech Language Pathologist to plan dysphagia treatment as the rehabilitation strategies used for dysphagia targets the physiology of the swallow (Daniels et al., 2019; Logemann, 1998; MartinHarris et al., 2000).

Site of brain infarct from acute are determinants of swallowing recovery as well as predicts prognosis to different treatment approaches (Kim et al., 2019; Suntrup-Krueger et al., 2018). However, evidence is scarce, and further investigations of the relationship between lesion locations and swallowing recovery are needed to support translation into clinical practice.

This highlights the need of current study to identify dysphagia characteristics in acute stroke patients specific to type and site of infarcts. In acute stage of stroke, dysphagia is found in up to 76% of patients and an increased mortality rate following aspiration is observed (Daniels & Brailey,2009).However there are very limited studies available to date to identify characteristics of swallowing dysfunction with respective to type, site of acute cerebral infarction as well as based on vascular territory.

OBJECTIVES OF THE STUDY

The objectives of the study are mentioned below

- To identify specific signs and symptoms following acute stroke in bedside swallow evaluation specific to type and site of infarcts.
- To determine dysphagia severity in patients with acute stroke using the Mann assessment of swallowing ability (MASA) specific to type and site of infarcts in stroke patients exhibiting moderate-severe dysphagia.
- To determine the dysphagia characteristics with respect to type, site of acute cerebral infarction as well as based on vascular territory (Oxfordshire classification) using clinical bedside evaluation of swallowing and Mann Assessment of swallowing Ability
- To identify deviations in oral-pharyngeal phase of swallowing while doing VFSS.
- To identify deviations in the kinematic parameters of Video-fluoroscopic evaluation of swallowing for different modified diet textures specific to type and site of brain infarcts with acute stroke.
- To suggest intervention and management strategies for the rehabilitation of the selected sample population of Dysphagia.

METHODOLOGY

This is a prospective study with descriptive diagnostic research design which was conducted in an acute hospital in Abu Dhabi.

Data obtained in this study were entered in the excel spread sheet and descriptive statistics of the explanatory and outcome variables were calculated by frequency and proportions for qualitative variables. Inferential statistics chi square test and Pearson partial correlation tests were used to test the statistical association for qualitative and quantitative variables respectively. $P<0.05$ was considered statistically significant. SPSS (Statistical Package for Social Sciences) version 20 was used to perform the statistical analysis.

The sample size of the study was 112 patients following acute stroke. The age range of the patients were 20 - 75 years. A total of 156 patients were analysed in the study from which following exclusion criteria 112 patients were included in the study. Patients referred to Speech Language Pathology service following admission to the acute government hospital with acute stroke onset from day 0 to day 5 were considered for the study from July 2017 till Dec 2018.Dysphagic assessment will be done within 48 hrs of admission to the stroke unit.

Patients with GCS (Glasgow Coma Scale) less than 12 and patients with previous stroke/previous history of swallowing impairment/with coexisting neurological disease that can account for dysphagia were excluded from the study.
Brain infarcts of each sample were determined on diffusion weighted MRI scans. The methodology included direct bedside swallow assessment with modified diet textures. The Bedside swallow assessment would include the following

a) Medical history
b) Clinical observation
c) Clinical Bedside swallow assessment would include:

- Assessment of oro-pharyngeal secretion management
- Assessment of oro-pharyngeal symptoms using different modified liquid and solid diet textures. Different

oropharyngeal symptoms analyzed include presence of disorganized tongue, anterior spillage, oral holding, nasal regurgitation, gurgly voice, pharyngeal residue, cough during swallow, cough post swallow, multiple swallows for intake of small bolus, piecemeal deglutition and respiratory effort with oral feeds. These symptoms are analyzed when each modified liquid is given to the patient which include thin fluids, nectar thick fluids, honey thick fluids and pudding thick liquids. In addition, if patient tolerates modified solids symptoms such as prolonged mastication, incomplete mastication, oral residue post swallow, presence of throat clearing. need of sequential swallows of fluids for pharyngeal clearance post intake of modified solids, sensation of solid bolus remaining in throat, piecemeal deglutition, multiple swallows, coughing during swallow, coughing post swallow, vomiting with solid intake,

- Assessment using standardized tools: The Mann Assessment of Swallowing Ability

RESULTS AND DISCUSSION

Age range of stroke patients

Among the 112 patients taken in the study 55.9% of patients belonged to 51 to 70 years followed by 25.2% of patients belonging to 31-50 years. Only 3.6% had stroke above 20 years and below 30 years.

Onset Of Stroke

Among the total of 112 patients 37.4% had hospital admission on day 3 of stroke onset. Around 27.5% of patients had hospital admission on day 2 of stroke onset. However, on 24 hours of stroke onset only 10.8% patients were admitted to hospital.

Based on Etiology of stroke

Among 112 patients involved in study design 76.5% of patients had hemorrhagic stroke and 12.1% had ischemic strokes.

Based on Symptoms exhibited post stroke

On analyzing the symptoms exhibited by 112 patients following stroke 94.5% were dysarthria/slurred speech,39.1% had aphasia, 58.1% had Right sided facial weakness, 26.5% had Left sided facial weakness.16.2 % patients were admitted to acute hospital following stroke with altered mental status and confusion.4.5% patients were agitated and restless on admission and 5.4% had low GCS requiring ICU admission for ventilation.

Based on Site of infarct following stroke

Among 222 stroke patients taken in the study, 35.1% had bilateral infarct, 34,2% had Left sided infarct and 30.6% had Right sided infarct.

Presence of NG tube following stroke

Among 112 patients admitted to hospital following stroke 25.7% had Naso-gastric tube due to presence of unsafe swallows following stroke on bedside swallow assessment.
Among these patients 40.3% were weaned to oral feeding with dysphagia rehabilitation.

Need of suctioning post stroke

On clinical observation of study samples of 112 patients following acute stroke 23.9% of patients needed suctioning following acute stroke for at least 2 weeks for oropharyngeal secretion management due to impaired reflexive salivary swallows from underlieing dysphagia with stroke.

Presence of Tracheostomy tube following stroke

6.8% patients with acute stroke among 112 had tracheostomy tube for respiratory and oropharyngeal secretion management during their ICU stay. Among these patients 53.3% of stroke patients were able to be successfully decannulated with rehabilitation by SLP within 2 months of stroke onset.

Severity of Dysphagia using MASA following acute stroke

On administering Mann Assessment of Swallowing Ability (MASA) 31.9% of study patients had no dysphagia. 25.2% of patients had Mild dysphagia with mild aspiration risk.18.9% of patients had mild aspiration with no aspiration risk.11.2% of patients had moderate dysphagia with moderate aspiration risk.9.4% of patients had severe dysphagia with severe aspiration risk.2.2% of patients had Moderate dysphagia with mild aspiration risk.

CONCLUSION

In conclusion, identification of patients at risk of aspiration or having oropharyngeal dysphagia is crucial in the acute stroke management, early rehabilitation can improve the outcome. The recognition of a brain lesion pattern associated with oropharyngeal dysphagia could help to distinguish those patients in need of more in-depth valuation and the subsequent adoption of preventive measures.

REFERENCES

1. Arnold M., Liesirova K., Broeg-Morvay A., Meisterernst J., Schlager M., Mono M.L., El-Koussy M., Kagi G., Jung S., Sarikaya H. Dysphagia in acute stroke: incidence, burden and impact on clinical outcome. PLoS One. 2016;11 [PubMed] [Google Scholar]
2. Ben-Shabat E., Matyas T.A., Pell G.S., Brodtmann A., Carey L.M. The right supramarginal gyrus is important for proprioception in healthy and stroke-affected participants: a functional MRI study. Front. Neurol. 2015;6 [PubMed] [Google Scholar]
3. Cola M.G., Daniels S.K., Corey D.M., Lemen L.C., Romero M., Foundas A.L. Relevance of subcortical stroke in dysphagia. Stroke. 2010; 41:482–486. [PubMed] [Google Scholar]
4. Crary M.A., Humphrey J.L., Carnaby-Mann G., Sambandam R., Miller L., Silliman S. Dysphagia, nutrition, and hydration in ischemic stroke patients at admission and discharge from acute care. Dysphagia. 2013; 28:69–76. [PubMed] [Google Scholar]
5. Dziewas R. Neuroimaging evidence for cortical involvement in the preparation and in the act of swallowing. NeuroImage. 2003;20(1):135–144. [PubMed] [Google Scholar]
6. Ekberg O., Hamdy S., Woisard V., Wuttge-Hannig A., Ortega P. Social and psychological burden of dysphagia: its impact on diagnosis and treatment. Dysphagia. 2002; 17:139–146. [PubMed] [Google Scholar]