

Frequency of post-stroke dysphagia in Pakistan: a hospital based study

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Abstract

Objective: Purpose of the study is to determine the frequency of dysphagia after stroke and to see the factors associated with it.

Methods: Cross Sectional study design was used by including individuals pre-diagnosed as stroke on the basis of CT scan or MRI findings. Study was conducted in three hospitals of Lahore within six months. Sample size of 150 patients of any age and both gender was taken by using convenient sampling technique. To assess the conscious level, Glasgow coma scale was administered and those who scored mild or moderate on GCS were included in the study. Modified Massey Bedside Swallow Screener was used to screen out the patients for dysphagia. SPSS-19 was used for the statistical analysis.

Results: In the sample of 150 individuals with stroke 53% of patients had dysphagia. Females were 38% while males were 62%. Individuals who were older were more likely to have dysphagia. Among dysphagic individuals 65% had ischemic stroke while 35% were with haemorrhagic. There were 87% of dysphagic individuals who presented with history of smoking and 13% were without any. These factors demonstrate significant relationship by showing p-value <0.05. While no significant difference was seen between levels of alertness and risk of dysphagia by showing p-value 0.2.

Conclusion: Dysphagia after stroke occurs frequently that should be actively assessed and factors like type of stroke and history of smoking are significantly related to this condition.

Keywords: Stroke, Deglutition Disorders, Epidemiology, Complications. (JPMA 66: 1281; 2016)

Introduction

The interruption of blood supply to the brain is defined as stroke that eventually cuts off the supply of oxygen and nutrients, causing damage to the brain tissue.¹ Stroke has been considered the second most common cause of death worldwide. Variety of neurological problems produced by this common problem of stroke that ultimately affects swallowing and specific concern is dysphagia because of having harmful effects that contribute to morbidity and mortality in these patients.²

Swallowing is a complicated procedure that requires voluntary and involuntary coordination of more than 40 pairs of muscles and several cranial nerves. Normal swallowing consists of three phases, the oral phase, pharyngeal phase and esophageal phase. These physiological phases of swallowing can present symptoms of dysphagia. During stroke each of these phases can be affected.³

Dysphagia is a derivative of Greek word "Dys" means "with difficulty or dysfunction" and "Phagia" means "to

eat". Thus, it is defined as difficulty in swallowing or processing food from mouth to the stomach.⁴ A severe consequence of stroke is dysphagia because of many risks like aspiration, airway obstruction, pneumonia, weight loss, dehydration and eventually death. Swallowing musculature is inequitably characterized in both motor cortices. When stroke affect the hemisphere dominant in swallowing prognostication it results in dysphagia. After which unaffected non-dominated hemisphere is then associated with compensatory modifications for clinical recovery. This phenomenon describes why up to half of stroke patients suffer from dysphagia and why several of them recover innocuous swallow after a relatively short period. In spite of this proclivity for recovery, dysphagia carries sevenfold increased risk of aspiration pneumonia and an independent forecaster of mortality.⁵

Individuals who had stroke are susceptible to multiple complications. Among them most recover within first week but dysphagia may also persist. An interdisciplinary approach to swallowing problems after stroke reported that surveys showed large number of patients suffer from swallowing difficulties following stroke which are either not referred or poorly managed during the precarious early phase.⁶

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An important part of acute stroke management is detection of dysphagia. Literature suggested that swallowing difficulties can affect 22-65% of patients that depends on the assessment procedure used. Dysphagia after stroke is an indicator of persistent disability, increased risk of chest infection, prolonged hospital stay, malnutrition, poor prognosis and mortality.⁷ It has been mentioned by previous studies that dysphagia is common in stroke patients and its incidence varies in different studies which is because of different screening methods.⁸ In a research by Hamidon et al. it was depicted that that a vast number of neurological impairments occur after stroke which includes major tasks like eating. However the exact prevalence of dysphagia varies in different studies that depend upon the assessment timing after stroke, selection benchmarks and methodology. Out of 134 total patients in their study, 41% had dysphagia.⁹ It has been described in literature that early screening and identification of dysphagia among people who survived after a stroke is very expedient in reducing rate of mortality and morbidity.¹⁰⁻¹²

Currently a variety of procedures are being used for the evaluation of swallowing disorders. And most common contradiction is between instrumental and non-instrumental or clinical examinations. Though, the mainstay in management of dysphagia is clinical bedside assessment because it frequently explains the method and basics of tasks as being the first line assessment.¹³ Risks to dysphagic patient's health after stroke are physical as well as cognitive functions impairment which further influence normal eating manner. Individuals after stroke are unable to consume food and drink because of many other factors that include fatigue, alertness level, incapability to maintain head and trunk alignment, curtailed postural stability and tone, cognitive and communication problems, visual perceptual difficulties as well as lack of insight and depression. Swallowing mechanism coordination not solely impacts one's nutrition level and hydration, but it is also an indicator of their rehabilitative potential. Therefore, the current study was planned to find the frequency of dysphagia in individuals who had stroke and to see the factors associated with it.

Subject and Methods

The cross sectional study was conducted from October 2014 to March 2015 comprising individuals of both gender and any age with the validation of stroke by neuroimaging studies. Data was collected by using convenient sampling technique from the individuals

admitted in neurology ward in three hospitals of Lahore (Combined Military Hospital, Mayo Hospital and Fatima Memorial Hospital). Sample size was calculated through online sample size calculator by using 90% Confidence Level and 5% margin of error.¹⁴ An estimated sample size of 267 participants was calculated while one hundred and fifty were recruited because they had good alertness level and ability to process further for swallowing evaluation. While those having any trauma or TBI, progressive neurological disease, tubal intubation and pre-existing conditions that contribute to dysphagia were excluded.

Data Collection Procedure

A proforma was used for record keeping purpose that included the bio data, medical history of the individuals and information about various associated conditions like history of smoking, level of alertness and type of stroke. Informed consent was obtained from respondent and approval of ethical committee was taken. To assess the conscious level, Glasgow coma scale (GCS) was administered. It classifies the alertness level into three categories mild, moderate and severe. To assess the ability to swallow safely a standardized screener that is Modified Massey Bedside Swallow Screen (MBSS) was used that was applied by a speech and language pathologist. MBSS was used for the screening of dysphagia in this study because it is very easy and quick screener. Moreover, there are many other causes of dysphagia such as Parkinson's disease, amyotrophic lateral sclerosis or multiple sclerosis but MBSS was mainly developed for assessing swallowing functions of patients with stroke. It has also been mentioned by Massey et al. that MBSS is a valid tool having high inter-rater reliability with 100% sensitivity and specificity.¹⁵ The data collection procedure included observing the patients for having good alertness level. Those who scored mild or moderate on GCS scale were investigated further. After that patient was given 3ml of plain water with a teaspoon to swallow it and then we looked for the indicators of dysphagia. The swallow was adjudged unsafe if the patient coughed involuntarily, choked during swallowing or within the first 2 minutes, lack of laryngeal elevation, change of voice like gurgly or wet sound quality and water dribbling out of the patient's mouth. If the patient did not show any above mentioned signs on 3ml of water then we gave 60ml of water and observed the indicators. Failure at any stage was taken as a failed swallow test considering patient as having dysphagia.

Data Analysis Procedure

The collected data was analyzed by using Statistical

Package of Social Sciences (SPSS 19). Frequency, percentages and level of significance were found with the help of p-value. To see reliability of scales used in the study Cronbach's Alpha was applied that requires value to be significant if >0.06 . The differences in mean were evaluated with Mann Whitney U test. Differences among groups were taken as significant if $p=0.05$ or <0.05 .

Results

Descriptive statistics showed that in sample 33% were females and 67% were males. Among them 53% participants had dysphagia while 47% were not dysphagic. Results also depicted that mean value of chronological age of the patients was 62 years. While minimum age was 38 years and maximum was 83 years. The Cronbach's alpha for the Glasgow coma scale and Massey Bedside swallow screener scale was 0.7 and 0.84 respectively which reflects a good internal consistency of the scale. No significant difference was seen in gender of individuals who had dysphagia showing p-value >0.05 . While the value of the mean rankings indicates that the female group had significantly higher risk of dysphagia than the male group. However, significant difference was found between ischaemic and haemorrhagic type of stroke as p-value is <0.05 . While the value of the mean rankings indicates that the group of individuals with ischaemic stroke had more chances of having dysphagia than the group of individuals who had haemorrhagic stroke. Level of significance was also found in smokers who were at risk of dysphagia by showing p-value <0.05 . Similarly, the value of the mean rankings indicates that the group of individuals with history of smoking had significantly higher risk of dysphagia than the group with no previous history of smoking. No significant difference was seen between individuals with mild or moderate level of alertness, showing p-value >0.05 . While the value of the mean rankings indicates that the individuals with moderate level of alertness had more chances of having dysphagia than those with mild level (Table).

Table: Factors associated with dysphagia.

Variables	Subgroups	Mean Rank	p	U
Gender	Male	72	0.3	2169.5
	Female	82		
Stroke Type	Ischaemic	83.77	0.000*	643.50
	Haemorrhagic	37.83		
H/o Smoking	Smokers	85.9	0.00*	1302.0
	Non- Smokers	51.8		
Alertness Level	Mild	72.64	0.2	2241.0
	Moderate	81.06		

Discussion

The study aimed at determining the frequency of dysphagia after stroke and to see the factors like gender, type of stroke, history of smoking and alertness level of individuals associated with this condition. It was observed that 53% individuals experienced dysphagia following stroke. Factors like type of stroke and previous history of smoking were significantly associated with dysphagic individuals. However, there was no association in gender and alertness level of study participants who had dysphagia. It was also observed that the individuals who had dysphagia were considerably older than others.

A study conducted in Mumbai-India investigated that 21/50 (42%) patients had post-stroke dysphagia during their hospital course. Giselle Mann et al conducted a study to assess swallowing function after stroke on 128 stroke patients and 51% were identified as having dysphagia on the basis of clinical bedside examination. Other researchers stated the frequency of dysphagia 51 to 55% with the help of clinical testing.^{16,17} These findings are also in favour of the present study that exhibited 53% frequency of dysphagia following stroke. Another study by Caroline et al. about dysphagia in acute stroke revealed no significant difference between gender and dysphagia. Likewise, our study didn't find any association between these two variables.

The level of consciousness has been observed to effect swallowing. By considering GCS, a metric of consciousness, literature suggested that there is no significant association between frequency rate of swallowing and GCS score.¹⁸ Likewise in the present study the results of GCS exposed no significant difference between swallowing difficulty and alertness level showing p-value 0.8. Different studies on measuring swallowing frequency in dysphagia after stroke has revealed that age is not markedly associated with rate of swallow frequency. Conversely, another study by Shaker et al. concluded that age contributes to the lessening of the swallowing frequency and supported the fact that individuals who are more likely to have dysphagia after stroke were usually older.^{19,20} Our study supported this view. Moreover, no significant difference was found among factors except smoking that was more common in the group of patients who had dysphagia. The results of the current study are in line with these findings. Researchers reported that the individuals who had dysphagia were less likely to have haemorrhagic stroke but more likely to have infarction. The results of another study conducted by Jon et al. concluded that more improvement is seen in haemorrhagic stroke rather than ischaemic one. Similarly, our data was found to be similar

to above mentioned studies.

As a consequence of increasing the bedside screening of dysphagia in stroke patients, it will be beneficial for the better management, pneumonia rates will decrease, malnutrition will be eliminated and recovery will improve. Detection and management of dysphagia after stroke at early stages is very crucial. If this condition is left untreated it can lead to hazardous health related issues.^{21,22} The aim of early swallowing screening is not only to reduce risk of aspiration pneumonia and improve outcomes but also to assist the provision of adequate nutrition in a satisfactory and harmless way. Thus the patients, who got diagnosed early for dysphagia, have therapy sessions on swallowing management and dietary modification show favourable trends towards positive outcomes.²³

The use of nasogastric tubes is usually prescribed in stroke patients with dysphagia or unsafe oral intake to maintain their nutritional needs.²⁴ For the effective management of post stroke dysphagia, a multi disciplinary team is required consisting of various professionals. A speech and language pathologist assists stroke patients for the assurance of safe swallow by making an accurate diagnosis. The dieticians can advise on the nutritional value as well as texture of food that helps the patients to swallow safely. The physiotherapist can help in maintaining proper posture like upright position while eating or drinking. An occupational therapist helps by providing equipment aids such as special feeding cups, non slip mats and plates that are specially designed to keep food warm. Psychologist can counsel the stroke patients and their family members regarding the adaptation of disability and taking new roles in family and workplace. Nurses also play a vital role in this team work because of their 24 hours availability to the patient.²⁵

Unfortunately, due to lack of research no previous statistics of post stroke dysphagia was found from Pakistan. This is the first hospital based epidemiological study conducted in Pakistan to see the frequency of dysphagia after stroke. The study was conducted in a specific region not including the entire country so the sample size is a limitation of our study and the subject needs to be further studied on a large scale. It is also recommended that bedside or early assessment of swallowing is of use and for this purpose a reliable and quick method of assessment would be of benefit which may helpful for further comprehensive assessment and intervention. Thus, early screening of dysphagia in stroke patients can help in decreasing aspiration pneumonia, it will also ensure safe swallow, reduce poor nutritional level and decrease the rate of morbidity.

Conclusion

The study was conducted to find the frequency of dysphagia following stroke and to see the conditions associated with it. It was concluded that dysphagia occurs frequently after stroke and it should be actively assessed because swallowing impairments can persist in many individuals that may lead to frequent complications. Factors like type of stroke and history of smoking are significantly related to this condition while no significant difference was seen in gender group and alertness level.

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Conflict of Interest: No.

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