

Incidence of Dysphagia after Acute Stroke

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ABSTRACT

Background: It has been reported that dysphagia is a commonly documented morbidity after stroke, but its reported frequencies are widely discrepant. There is emerging evidence that early detection of dysphagia in patients with acute stroke reduces not only these complications but also reduces length of hospital stay and overall healthcare expenditures.

Aim: To determine the incidence of dysphagia after acute stroke.

Methods: This is descriptive observational study was conducted between October 2013 to January 2014 at CMH Lahore. A total of 40 patients with stroke were included in this study. Incidence of dysphagia after acute stroke was determined by collecting data from the patients with stroke by using a questionnaire. The questionnaire constituted the questions regarding dysphagic issues.

Results: Result indicated that out of 40 subjects 32(80%) were male and 8(20%) were female and the mean age of patients was 30.0± 88 years. The data on clinical findings of the patients with stroke showed that almost 27(67.5%) had swallowing problem and 13(32.5%) didn't have swallowing problem. The evaluation of these patients with dysphagia showed that 3(7.5%) were diagnosed with swallowing problem at oral stage, 20(50%) at pharyngeal stage and 4(10%) at esophageal stage and level of their swallowing difficulty was 6(15%) mild, 10(25%) moderate and 11(27.5%) severe. Further investigation revealed that 10(25%) had coughing, 10(25%) choking and 7(17.5%) difficulty in swallowing and difficulty in swallowing reported by the patients was 14(35%) in liquids, 2(5%) in semi-solids and 11(27.5%) having problem in swallowing solids.

Conclusion: It is concluded from the above study that incidence of dysphagia depends upon the severity of stroke and type of stroke.

Keywords: Stroke, Dysphagia, Odonophagia.

INTRODUCTION

Swallowing is dependent on both sensory and motor control, or on input from both afferent and efferent systems. Both sensory and motor information are required for the onset of the swallow reflex. When swallowing, sensory feedback is more crucial than when speaking. The trigeminal, facial, and glossopharyngeal nerves all provide sensory information to the beginning of the swallow. The tongue's muscle spindles provide information about motor movement to the hypoglossal nerve¹.

The swallowing centre, thought to be situated in the medulla, within the nuclei of the reticular formation, notably the nucleus ambiguus, receives sensory and motor input from these sources. This centre allows signals to be transmitted to the glossopharyngeal, vagus and hypoglossal nerves when the swallow reflex is triggered. The primary nerve for the swallowing center is thought to be the glossopharyngeal. The innervations for swallowing come from six of the cranial nerve².

The oral preparation phase, oral phase, pharyngeal phase, and oesophageal phase are the four separate phases of swallowing. The volume and nature of the meal, as well as the deliberate control over the ingested bolus, have a significant impact on the duration and features of these phases. Additionally, it's probable that not all swallowing processes involve all stages. For instance, swallowing saliva in the pharynx does entail both the oral preparation and oral phases of swallowing³.

This process includes handling the food and, if required, masticating it to make it easier to swallow. The subject's swallowing tendencies and the viscosity of the substance to be ingested influence the movement patterns during the oral preparation phase. The amount of the bolus that has to be swallowed varies depending on how viscous the meal is; the more viscous the food, the smaller the bolus that needs to be swallowed. If the mouth contains bigger amounts of food, the tongue splits it after chewing to create the necessary amount to be swallowed and secludes the remaining food on the side of the mouth for a later

swallow. The airway is open, the larynx and pharynx are at rest, and nasal breathing is still occurring during the oral preparation phase. A portion of the meal may thus reach the airways if it penetrates the pharynx⁴.

Respiration stops (apnea periods) while swallowing is in the pharyngeal phase since the two functions are reciprocal. The airway is completely open during the oral preparatory, oral, and oesophageal stages. For a regular swallow, breathing and swallowing must be coordinated; any mismatch leads to aspiration. In the most common pattern of coordination, swallowing pauses exhalation and is followed by the subject's return to exhalation. The exhale at the conclusion of the swallow clears the larynx and throat, forming minor residues of materials that keep them from entering the airways, making this coordination recognised to be safer. Dysphagia patients were observed to swallow more often, which may increase the risk of aspiration⁵.

The medical word for the symptom of swallowing trouble or improper swallowing, which can be brought on by a wide range of illnesses and conditions, is dysphagia. Due to the possibility of aspiration pneumonia, starvation, dehydration, weight loss, and airway blockage, dysphagia can pose a major threat to one's health. In populations with neurologic and non-neurologic diseases, dysphagia has a variety of aetiologies⁶.

Dysphagia is a common post-stroke illness that has been observed, however reports of its reported frequency vary greatly, from 19 to 81%. According to growing research, individuals with acute stroke who have dysphagia are more likely to have fewer problems, shorter hospital stays, and lower total healthcare costs⁷.

Swallowing physiology can be hampered by cerebral, cerebellar, or brain stem strokes. In the oral phase, cerebral abnormalities can prevent the voluntary regulation of mastication and bolus transfer. Precentral gyrus cortical lesions may result in contralateral compromise in pharyngeal peristalsis as well as contralateral impairment in face, lip, and tongue motor coordination. Swallowing control may be hampered by cerebral lesions that affect cognitive abilities like focus or selective attention. Despite being less frequent than cortical lesions, brain stem strokes cause the greatest swallowing impairment. The feeling of the mouth, tongue, and cheeks, timing of the pharyngeal

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swallow trigger, laryngeal elevation, glottic closure, and cricopharyngeal relaxation can all be impacted by brain stem injuries. Regardless of the lesion's location, normal aging-related swallowing might exacerbate stroke-related dysphagia since stroke is more frequent in the elderly. Age-related decreases in skeletal muscle strength that impair mastication or weaken lingual pressure may no longer be able to be made up for by the elderly post-stroke patient. Accordingly, depending on the kind of stroke and the patient's age, one or more components of swallowing may be compromised⁸.

Depending on the precise site of the stroke, different neurologic symptoms might occur. Symptoms of a supratentorial infarct might include ipsilesional hemiparesis, dysarthria, aphasia, and hemispatial neglect. Neurologic symptoms associated with a lateral medullary infarct may include ataxia, diminished ipsilesional limb pain and temperature feeling, diminished contralesional pain and sensation in the trunk and limbs, and diminished contralesional velar, pharyngeal, and laryngeal paralysis. Aspiration, diminished hyolaryngeal elevation, delayed oral transfer, delayed elicitation of a pharyngeal swallow, and oral lateral sulci retention are a few examples of the several swallowing problems that can occur in stroke patients⁹.

Dysphagia's major side effects include coughing and choking, which can result in pneumonia. The possibility of food, liquids, or saliva going down the "wrong way" increases if you have dysphagia. Your airway may get blocked, which makes it difficult to breathe and may cause you to cough or choke. You could get afraid of choking if you have dysphagia. However, it's crucial that you don't skip meals or drinks because doing so might cause malnutrition and dehydration. You may also be more likely to develop an illness known as aspiration pneumonia if you frequently choke on your food as a result of dysphagia pneumonia due to aspiration. If you accidentally breathe in anything, such a little particle of dust, you might get aspiration pneumonia, a chest infection¹⁰.

Aspiration pneumonia symptoms include: a cough, which might be dry or result in the production of yellow, green, brown, or blood-stained phlegm. a temperature of at least 38C (100.4F). chest pain Breathing problems: Even while you're resting, your breaths may be quick and shallow, and you may feel out of breath¹¹.

Neurogenic dysphagia is thought to affect 400,000 to 800,000 people annually worldwide. Variable patient selection (e.g., consecutive patients, case series) and evaluation methodologies play a role in the reported prevalence of dysphagia in particular neurologic illnesses (e.g., questionnaire, clinical evaluation, diagnostic evaluation). In accordance with VSSs, dysphagia affects 65% of acute stroke patients, and aspiration occurs in between 43 and 58% of cases. 40 to 70% of acute stroke patients who aspirate do so quietly. In other words, when material meets the real vocal folds or enters the trachea, there is no obvious symptom of aspiration, such as a cough or voice change¹².

13% to 94% of acute stroke victims experience dysphagia (difficulty eating and swallowing), with prevalence varying depending on the size and location of the lesion. Every year, 700,000 people in the United States and 2000 persons per million globally suffer from strokes. Haemorrhage only accounts for 20% of strokes, but internal carotid artery atherosclerosis or cardiac embolism causes 80% of secondary ischemia¹³.

With such a pronounced likelihood of recovery, several writers have attempted to assess the influence of dysphagia on a wide range of clinical outcomes. Clinical dysphagia and a higher chance of chest infections have been linked by several writers. Holas et al. and Kidd et al. showed a higher incidence of chest infection among the studies employing VFS to confirm aspiration. Katzan et al discovered a threefold greater risk of mortality among stroke patients if they acquired pneumonia in an analysis of over 14 000 individuals in the USA. This risk was computed after taking stroke severity into account. Therefore, the mortality rate for people who have had a dysphagia stroke ranges from 27 to 37%.

Unpublished data from our department indicate that patients who aspirate while on VFS have a worse prognosis than individuals who have shown safe swallowing. Perhaps not unexpectedly, the difference in mortality is only shown in the first three to six months¹⁴.

As many other variables, including age, immunological condition, posture, dentition, mental state, and respiratory comorbidity, may also be at play, an exact association between aspiration and chest infection is not always unavoidable. Most stroke patients will get a chest infection while they are being treated in a hospital, with the percentage ranging from 12 to 30 %. Undoubtedly, a link exists between poor nutritional status and a higher death rate following acute stroke hospitalization. In spite of the fact that this reflects pre-stroke status rather than post-stroke dysphagia, one may anticipate that persistent nutritional status decrease may still be significant in this group of patients. As a result, dysphagia does have prognostic consequences and has to be evaluated in all patients who arrive with stroke symptoms¹⁵.

METHOD

A total of 40 patients with stroke were included in this study. Incidence of dysphagia after acute stroke was determined by collecting data from the patients with stroke by using a questionnaire. The questionnaire constituted the questions regarding dysphagia issues. This is descriptive observational study was conducted between October 2013 to January 2014 at CMH Lahore. Verbal consent from the patient and parents was taken. In this study there were no ethical issues because this is not experimental study.

RESULTS

Out of 40 subjects 32(80%) were male and 8(20%) were female whereas the mean age of patients was 61.55±12.17 years (Table 1).

Table 1: Participants characteristics

Demographics	Frequency	Frequency
Gender	Male	32 80%
	Female	8 20%
Age of Patients	Minimum	Maximum
	30	88
		61.55±12.17

Results indicated that on asking about the cause of the disease 40(100%) responded that they had stroke. On asking the respondent about the mental status of patients after stroke 40(100%) patients responded with alert. On asking the respondent about swallowing problems after stroke the responses showed that out of 40(100%) patients 27(67.5%) had swallowing problem and 13(32.5%) didn't have swallowing problem. On asking the respondents about the types of swallowing issues the responses showed that out of 40(100%) patients, 16(40%) were diagnosed swallowing problem at oral stage, 20(50%) at pharyngeal stage and 4(10%) at esophageal stage. On asking the respondent about the severity of swallowing issues out of 40(100%) patients, 6(15%) had mild, 10(25%) had moderate and 24(60%) had severe level of dysphagia.

On asking the respondents about swallowing difficulties at different consistencies of food the responses showed that out of 40(100%), 8(20%) patients reported that they faced difficulty in swallowing liquids, 12(30%) in semi-solids and 20(50%) having problem in swallowing solid. On asking the respondent about the food and liquid trials out of 40(100%) patients, 38(95.0%) had upright food trials position and 2(5%) had slightly reclined food and liquid trials position. On asking the respondent about having pain on swallowing out of 40(100%) patients, 8(20%) reported pain on swallowing and 32(80%) didn't have. On asking the respondent about their weight loss out of 40(100.0%) patients, 18(45%) reported to have weight loss and 22(55%) didn't have. On asking the respondent history of aspiration and pneumonia. Out of

40(100%) patients, 12(30%) had history of aspiration & pneumonia and 28(70%) didn't have. On asking the respondent about respiratory sufficiency and coordination out of 40(100%) patients, 23(57.5%) had normal respiratory sufficiency & coordination, 6(15.0%) had mild, 10(25%) had moderate and 1(2.5%) had severely impaired respiratory sufficiency & coordination (Table 2).

Table 2: Question wise analysis.

Questions	Response	Frequency
Medical diagnosis	Neurogenic	40 (100.0%)
If Neurogenic then what is cause	Stroke	40 (100.0%)
Mental status	Alert	40 (100.0%)
Swallowing problem	Yes	27 (67.5%)
	No	13(32.5%)
Swallowing diagnosis	Oral	16 (40.0%)
	Pharyngeal	20(50.0%)
	Esophageal	4(10.0%)
Severity level	Mild	6(15.0%)
	Moderate	10(25.0%)
	Severe	24(60.0%)
Symptoms of patients	Coughing	10(25.0%)
	choking	10(25.0%)
	Difficulty in swallowing	20(50.0%)
Swallowing difficulty	Liquid	8(20.0%)
	Semi-solids	12(30.0%)
	Solids	20(50.0%)
Food and liquid trials position	Upright	38(95.0%)
	Slightly	2(5.0%)
	Fully reclined	0(0.00)
Pain on swallowing	Yes	8(20.0%)
	No	32(80.0%)
Weight loss	Yes	18(45.0%)
	No	22(55.0%)
History of aspiration or pneumonia	Yes	12(30.0%)
	No	28(70.0%)
Respiratory sufficiency & coordination	WNL	23(57.5.00%)
	Mild	6(15.00%)
	Moderate	10(25.00%)
	Severe	1(2.5.00%)

DISCUSSION

Dysphagia is a clinical symptom of underlying stroke. Patient with dysphagia need intensive speech therapeutic sessions. There had been many studies on incidence of dysphagia after acute stroke but the investigation of this type did not appear to be carried out among the population of Lahore. For this reason this study was conducted to evaluate incidence of dysphagia after acute stroke. The total study population of 40 subjects consists of 32(80%) male and 8(20%) female. The Estimated populations mean age of patients was 61.55±12.169 with minimum age of 30 and maximum age of 88 years. The results indicated directly that out of 40 subjects all were medically diagnosed with Neurogenic disorder and had stroke. The data on clinical findings of the patients with stroke showed that almost 27(67.5%) had swallowing problem and 13(32.5%) didn't have swallowing problem.

After reviewing the literature, it was found that the data from 151 consecutive inpatients who had recently suffered an ischemic or haemorrhagic stroke were helpful to Paolo Falsetto, Catherina Acciai, Rosanna Palilla, Marco Bosi, Francesco Carpinteri, Alberto Zingarelli, Claudio Pedace, and Lucia Lenzi. According to the findings, 62 out of 151 individuals had a clinical diagnosis of dysphagia (41%). 49 individuals, or 79% of those with clinical dysphagia, received VFS. Six individuals with a clinical diagnosis of dysphagia had normal VFS results.

The Evaluation of these patients with dysphagia showed that 3(7.5%) were diagnosed with swallowing problem at oral stage, 20(50%) at pharyngeal stage and 4(10%) at esophageal stage and level of their swallowing difficulty was 6(15%) mild, 10(25%)

moderate and 11(27.5%) severe. Further investigation revealed that 10(25%) had coughing, 10(25%) choking and 7(17.5%) difficulty in swallowing and difficulty in swallowing reported by the patients was 14(35%) in liquids, 2(5%) in semi-solids and 11(27.5%) having problem in swallowing solids. On asking about the saliva swallow patients, 26(65%) reported normal swallowing of saliva and 14(35%) reported impaired saliva swallowing. Also 8(20%) reported pain on swallowing, 18(45%) weight loss and 12(30%) had history of aspiration & pneumonia. Oral status of 23(57.5%) patients was normal, 4(10%) had mild, 13(32.5%) had moderate level of severity. Mann G, Hankey G.J, and Cameron D investigated 128 patients with acute first-ever stroke to ascertain the incidence of swallowing difficulties after examining the literature. According to the statistics, aspiration affected 49 % (95%ci 40-58% of patients, swallowing disorders affected % (95 % confidence interval (CI) 55-72%) of patients, and swallowing disorders affected 21% (95% confidence CI 15-29%) of patients.

CONCLUSION

On the basis of obtained findings it was concluded that incidence of dysphasia after acute stroke was in high proportion.

Limitations: The study was carried out on dysphagia patients in Lahore considering the nature of the topic.

Conflict of interest: Nil

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