

# Dysphagia in Patients with Stroke: A Prospective Study

K. Balamurali<sup>1</sup>, D. Sekar<sup>2</sup>, M. Thangaraj<sup>3</sup>, M. Arun Kumar<sup>4</sup>

<sup>1</sup>Assistant Professor, Department of Neurology, <sup>2</sup>Senior Assistant Professor, Department of Internal Medicine, <sup>3</sup>Professor and HOD, Department of Neurology, <sup>4</sup>2<sup>nd</sup> Year DM Neurology Resident, Department of Neurology, Government Thanjavur Medical College, Thanjavur, India

**Corresponding author:** Dr. D. Sekar, Senior Assistant Professor, Department Of Internal Medicine, Government Thanjavur Medical College, Thanjavur, India

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## A B S T R A C T

**Introduction:** Dysphagia affects the vast majority (more than 50%) of acute stroke patients. It is important from the point of view of treating neurologists to identify and manage dysphagia in stroke patients because there is emerging evidence from studies to show that early detection of dysphagia reduces subsequent pulmonary complications in these patients. We conducted this study of patients with dysphagia at various period of stroke and their presentation over a period of 1 year. Current research aimed to study dysphagia and its relation with type of stroke and to study the outcome of patients having post-stroke dysphagia.

**Material and Methods:** This was a prospective study conducted in the department of neurology at a medical institute situated in an urban area. All patients diagnosed with stroke and having dysphagia were included in this study on the basis of a pre-defined inclusion criteria. Patients having any exclusion criteria were excluded from the study. Imaging studies were reviewed to know type of stroke and involved territory of the brain. Patients were followed up for 1 year and management, complications and outcome was studied.

**Results:** Out of 70 patients there were 42 males and 28 females with a M:F ratio of 1:0.66. Majority of the patients (82.85%) were more than 40 years of age while young stroke patients consisted of 17.14% of the studied cases. On the basis of imaging the most common type of stroke was found to be caused by posterior circulation infarcts (30%) followed by partial anterior circulation ischemic stroke (25.72%), total anterior circulation ischemic stroke (21.42%), lacunar infarct in (7.15%) and hemorrhagic stroke (15.71%).

**Conclusion:** Dysphagia is seen in almost two-third cases of stroke and may have severe consequences if not managed properly. It is important from the point of view of treating neurologists to identify and treat this condition so as to prevent morbidity and mortality in these patients. More research is urgently needed to develop more effective swallowing therapies.

**Key words:** Post-Stroke Dysphagia, Complications, Management, Outcome.

## INTRODUCTION

Dysphagia defined as a difficulty in swallowing of fluids and/or solid foods. Though may be appropriate in routine cases may not be suitable for patients of stroke who may have various neurological deficits as well as cranial nerve palsies<sup>1</sup>. In cases of patients with stroke dysphagia may be defined as a disruption of bolus flow through the mouth and pharynx. As the primary function of swallowing is the safe passage of a food bolus from mouth to the stomach the immediate consequence of disruption of such a smooth flow is invariable aspiration of food particles into the airway which is a cardinal feature of dysphagia in patients with stroke<sup>2</sup>. Aspiration and malnutrition are the cardinal features of dysphagia seen in post-stroke patients. Recognizing these complications is important from the point of view of treating neurologists and failure to do so may result in complications like pneumonia, consolidation and various other respiratory complications thereby increasing morbidity and hospital

stay<sup>3</sup>. Sudden massive aspiration may even prove fatal in these patients<sup>4</sup>.

Clinical assessment of the patients for dysphagia is fairly accurate if sufficient time is given to look for indicators of dysphagia such as loss of liquid from the mouth, dyspraxia or uncoordinated movements of the muscles, facial weakness, delayed pharyngeal/laryngeal elevation, coughing or throat clearing, breathlessness, and changes in voice quality after swallowing<sup>5</sup>. Presence of any or more than one of these features may strongly suggest presence of dysphagia. Intact Gag reflex was earlier considered to be suggestive of absence of dysphagia but this has largely been discarded<sup>6</sup>. Video fluoroscopy is a type of modified barium swallow and has been traditionally considered as gold standard for assessment of swallowing. In this procedure a radio-opaque barium liquid is given for swallowing and images are captured in lateral and occasionally anteroposterior views. The passage of barium liquid can be videographed and can

be seen repeatedly to find out possibility of aspiration and uncoordinated movements<sup>7</sup>. Other method of assessment of swallowing include fiberoptic endoscopic evaluation of swallowing which consist of placement of a naso-endoscope to the level of the uvula or soft palate to give a direct view of the hypopharynx and larynx<sup>8</sup>. The advantages of this procedure include a very low complication rate and unlike video fluoroscopy no radiation is involved in this procedure. The incidence of dysphagia is fairly common after stroke. Various studies have reported this incidence to range between 30% to 50%. This wide range may be because of different study designs<sup>9</sup>. Moreover, stages at which patient presented may also have a bearing on the percentage of affected patients. Lastly identification of dysphagia on the basis of video fluoroscopy is expected to identify it more accurately than clinical diagnosis and hence the studies based upon video fluoroscopy may have a higher percentage of affected patients than the studies in which the diagnosis of dysphagia was made on the basis of clinical examination only. Notwithstanding these differences in the incidence even the minimum reported incidence is fairly high to have critically look for it in all patients presenting with stroke<sup>10</sup>. Clearly the goals in dysphagia therapy is to reduce the morbidity and mortality associated with chest infections and improve nutritional status of the patients with stroke. This will eventually ensure early mobilization and less hospital stay.

We conducted this prospective study of patients with stroke to find out incidence of dysphagia and its presentation and outcome over a period of 1 year.

## MATERIAL AND METHODS

This was a prospective study conducted in the department of neurology of a tertiary care medical college situated in an urban area. 70 patients with any type of stroke (ischemic or hemorrhagic) and having been diagnosed to be having dysphagia were enrolled in this study on the basis of a predefined inclusion criteria. This prospective study was done over a period of 1 year and all the patients were followed up at least for 1 year after discharge. The patients who didn't come for follow up at least for a period of 1 year were also excluded from the study. Imaging in all the patients were done by CT Brain and MRI stroke protocol (T1, T2 weighted imaging accompanied by diffusion weighted and GRE images) was done in cases where CT brain gave equivocal findings. All patients initially were given nothing by Mouth till they regained consciousness. Later nasogastric feeding was started and intravenous fluids were discontinued. Later liquid diet followed by small food boluses were given. The diagnosis of dysphagia was done clinically by expert neurologist. Bedside evaluation of swallowing included the assessment of ability to cough voluntarily, throat clearing, ability to swallow the saliva. If the patient could do this successfully then a small amount of water was given and presence of voice change, cough during swallowing, any respiratory difficulty or presence of choking was looked for. If there were no problems in taking this small amount of liquid then patient was given semisolid food bolus and any respiratory difficulty, cough, voice change or choking

was looked for and its presence was taken as indicative of dysphagia. The severity of dysphagia was determined by dysphagia outcome and severity scale.

All the patients with dysphagia received, speech and swallowing therapy where they were taught dietary modification, correct posturing for feeding, advice on safe feeding practices and effortful and voluntary swallowing. Progression or resolution of dysphagia was studied in these patients over a follow up period of 1 year. The statistical analysis was done using Minitab version 17.

P value of less than 0.05 was taken as significant.

### Inclusion Criteria

1. Patient of stroke (1<sup>st</sup> episode) and having dysphagia.
2. Age more than 18 years.
3. Those who has given informed consent to be part of study.

### Exclusion Criteria

1. Age less than 18 years.
2. History of dysphagia before stroke.
3. Those who refused consent to be part of the study.
4. History of stroke in past.

## RESULTS

This was a prospective study comprising of 70 patients presenting with stroke for the first time and having been diagnosed to be having dysphagia. Out of these 70 cases there were 48 (68.6%) males and 22 (31.4%) females with a M:F ratio of 1: 0.66.

The analysis of the age group of the patients showed that the most common age group to be affected was 51-60 years followed by 61-70 years and 41-50 years. The mean Age was found to be 52.8 years (figure-1).

The analysis of the patients on the basis of predisposing factors for development of stroke showed that 16 patients (22.85%) had hypertension, 12 patients (17.14%) had diabetes mellitus while 14 patients (20%) had diabetes as well as hypertension. The other predisposing factors for stroke was found to be rheumatic mitral valve regurgitation and history of cardiac arrhythmias in 1 patient each (2.85%) (table-1).

Amongst the patients presenting with stroke and dysphagia majority of the patient had posterior circulation infarcts (30%) followed by partial anterior circulation ischemic strokes (25.72%), total anterior circulation ischemic strokes (21.42%) and lacunar infarcts (7.15%). Hemorrhagic stroke was seen in 11 patients (15.71%) (figure-2).

In male patients posterior circulation infarct was found to be the most common cause of stroke while partial anterior circulation ischemic was most common cause of stroke in

Age Group	Number of Patients	Percentage
18-30 years	4	5.7%
31-40 years	8	11.4%
41-50 years	14	20%
51-60 years	24	34.3%
61-70 years	20	28.6%

**Table-1:** Age distribution of the patients with post-stroke dysphagia.

Sr. No	Type of stroke	Males		Females		Total	
		N	%	N	%	N	%
1	Posterior circulation infarcts	14	20	7	10	21	30
2	Partial anterior circulation ischemic strokes	7	10	11	15.71	18	25.72
3	Total anterior circulation ischemic strokes	11	15.71	4	5.71	15	21.42
4	Lacunar infarcts	3	4.28	2	2.85	5	7.15
5	Hemorrhagic stroke	7	10	4	5.71	11	15.71
	Total	42	60	28	40	70	100

Table-2: Type of Stroke and gender distribution.

Complications	No of Patients	Percentage
Aspiration Pneumonia	8	11.42%
Generalized Wasting	6	8.57%
Dehydration	12	17.14%
Combination of 2 or more complications	7	10%
Total	33	47.14%

Table-3: Complication in the studied cases.

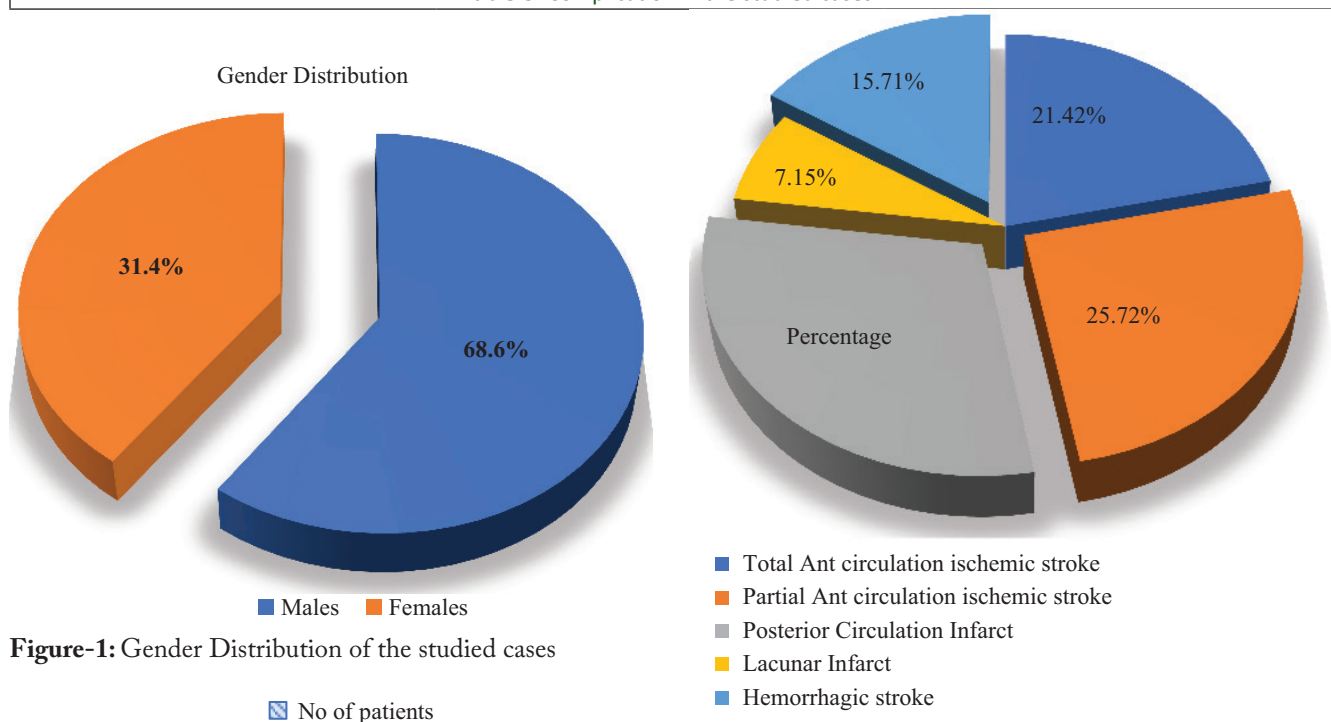


Figure-1: Gender Distribution of the studied cases

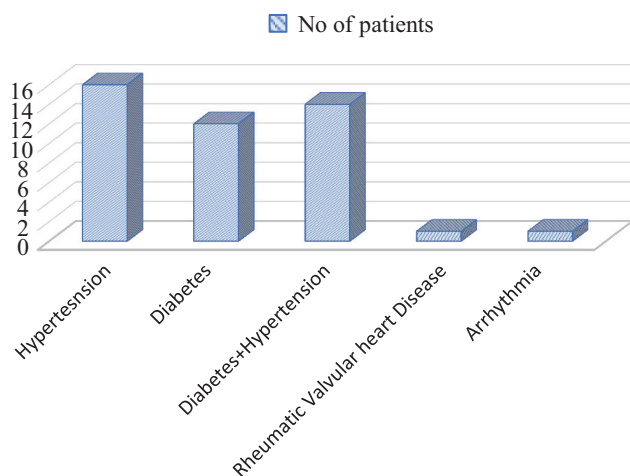


Figure-2: Risk Factors For Stroke

females (figure-3).

The severity of dysphagia was determined by dysphagia outcome and severity scale which is a simple easy to use

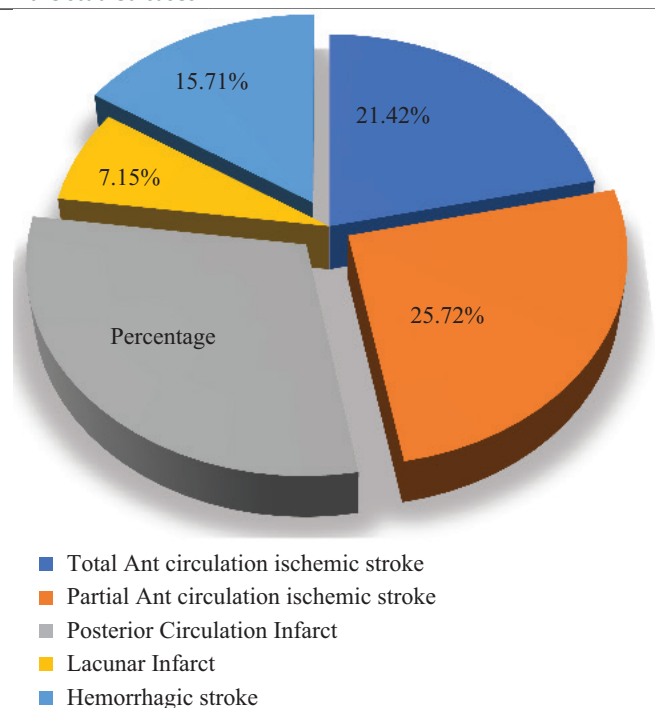


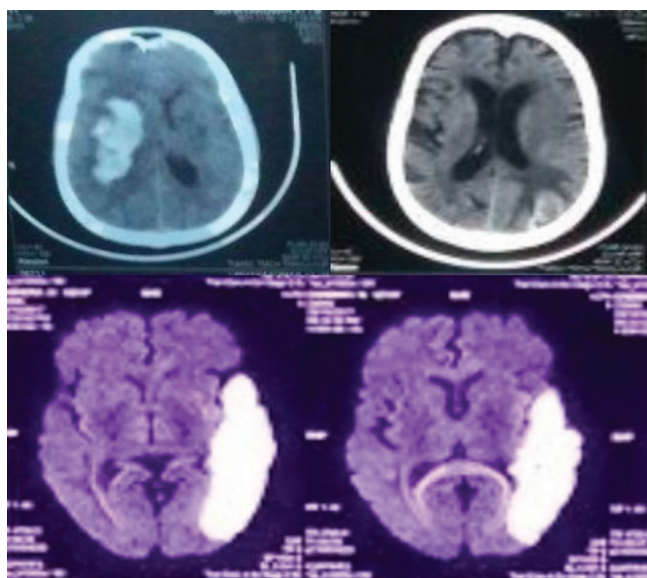
Figure-3: Type of stroke in studied cases

7-point scale developed to rate the functional severity of dysphagia based on objective assessment. Based upon this the dysphagia severity was divided into mild moderate and severe dysphagia. Most common type of dysphagia in studied cases was found to be mild dysphagia which was seen in 44 patients (62.85%) followed by moderate dysphagia seen in 21 patients (30%). 5 patients (7.14%) had severe dysphagia (table-2, figure-4).

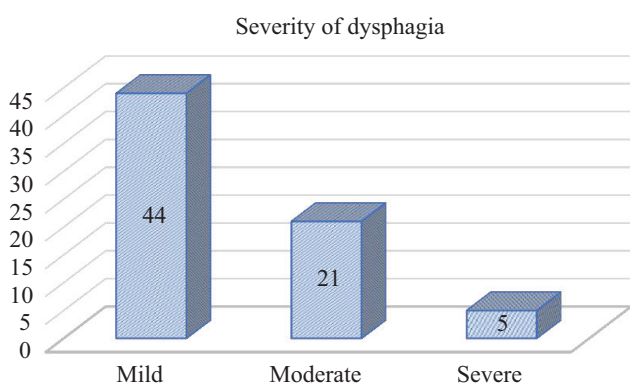
The analysis of complication related to dysphagia in studied cases showed that total 33 patients (47.14%) patients developed complications like aspiration pneumonia, generalized wasting, dehydration or a combination of these at some or the other stages of follow up (figure-5).

All the patients were treated by speech and swallowing therapy where they were taught dietary modification, correct posturing for feeding, advice on safe feeding practices and effortful and voluntary swallowing. Patients with severe

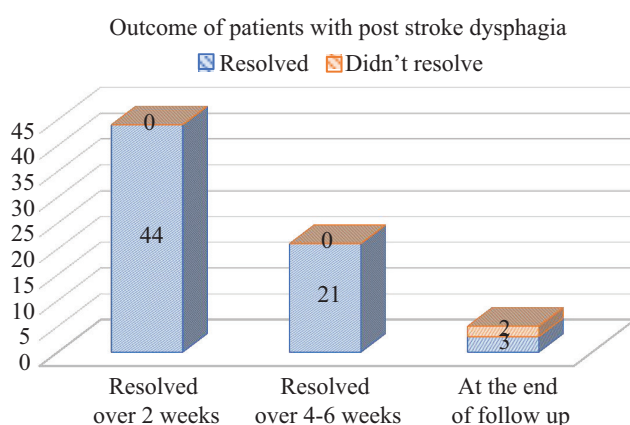




**Figure-4:** Images (Clockwise from left upper corner) showing Non-contrast CT showing hemorrhagic stroke with extension of hemorrhage into right ventricle. Left occipital hemorrhagic stroke with perilesional edema. MRI diffusion weighted images suggestive of restricted diffusion s/o acute stroke involving left MCA territory



**Figure-5:** Severity of Dysphagia



**Figure-6:** Resolution of dysphagia in studied cases.

dysphagia were given nasogastric feeding till they improved. All patients were followed up for 1 year for assessing resolution of dysphagia. Out of 70 patients 44 patients who had simple dysphagia improved over a period of 2 weeks and were able to take semisolid food. 21 patients required

4-6 weeks for resolution of dysphagia. Out of remaining 5 patients who had severe dysphagia 3 patients improved over a period of 6 months and 2 patients still had severe dysphagia at the end of 1 year follow up and were receiving enteral feeding at the end of 1 year follow up (table-3, figure-6).

## DISCUSSION

We conducted this study to find out clinically presence of severity of dysphagia in patients who were admitted to neurology department after first episode of stroke. The diagnosis of dysphagia was done on the basis of clinical examination and severity of dysphagia was determined on the basis of dysphagia outcome and severity scale.

Dysphagia in patients with stroke has been a topic of great interest for many researchers because of its potential complications such as aspiration, pneumonia and malnutrition. These complications are not only responsible for increased morbidity but also prolonged hospital stay<sup>11</sup>. Moreover, in some cases massive aspiration may prove fatal. The duration of dysphagia depends upon factors like area of brain affected, severity of dysphagia and its management. Nilsson H et al conducted a prospective study of 100 consecutive patients with stroke. The authors assessed presence of dysphagia in these patients Within 24 h after stroke. The diagnosis of dysphagia was done on the basis of clinical examination including neurologic examination, Mini-Mental test, and Barthel score. Dysphagic patients were examined with the repetitive oral suction swallow test (the ROSS test) for quantitative evaluation of oral and pharyngeal function at 24 h, after 1 week, and after 1 month. At 6 months, the patients were interviewed about persistent dysphagia. Seventy-two patients could respond reliably at 24 h after the stroke onset and 14 of these complained of dysphagia. The authors found that the presence of dysphagia was not influenced by age or other risk factors for stroke. One of the important findings of this study was that dysphagia 24 hours after stroke increased the risk of pneumonia but did not influence the length of hospital stay, the manner of discharge from hospital, or the mortality<sup>12</sup>. Similar findings were seen in studies conducted by T.Hill et al<sup>13</sup> and Martino R et al<sup>14</sup>.

Unlike in other patients, patients with stroke may be partially or completely unaware of the dysphagia and this may lead to delay in the diagnosis of post-stroke dysphagia unless this entity is actively looked for by primary physician or treating neurologist. Parker C et al conducted a study of 70 patients who were examined 72 hours post hemispheric stroke. Patients were screened for dysphagia by clinical assessment, followed by a timed water swallow test to examine swallowing performance. Patient awareness of dysphagia and its significance were determined by detailed question-based assessment. Medical records were examined at three months. Dysphagia was identified in 27 patients, 16 of whom had poor awareness of their dysphagic symptoms. Dysphagic patients with poor awareness drank water more quickly (5 ml/s vs. <1 ml/s,  $p = 0.03$ ) and took larger volumes per swallow (10 ml vs. 6 ml,  $p = 0.04$ ) than patients with good awareness. The authors found that dysphagic stroke patients, regardless of good or poor awareness of the clinical indicators of dysphagia, rarely perceive they have

a swallowing problem. The authors concluded that since majority of stroke patients are not fully aware of dysphagia it should be actively diagnosed and treated to prevent further complications<sup>15</sup>. Similar studies on inability of the stroke patients to perceive dysphagia were conducted by Boczek et al<sup>16</sup>.

Management of dysphagia after stroke may consist of speech and swallowing therapy, dietary modification, correct posturing for feeding, advice on safe feeding practices and effortful and voluntary swallowing<sup>17</sup>. In intractable cases alternative methods of feeding like nasogastric or enteral feeding may be needed. Since the diagnosis of dysphagia is difficult in stroke patients management of this still remain neglected<sup>18</sup>. Even adequate research has not been undertaken on this aspect of management of stroke patients<sup>19</sup>. Cohen. Liu H et al in their study found that improving the nursing care of patients with post-stroke dysphagia is crucial in preventing the complications such as malnutrition and aspiration<sup>20</sup>.

## CONCLUSION

Dysphagia is a very common finding in patients after stroke. Its recognition by treating neurologist is crucial as patients themselves may not be fully aware of their dysphagia. Swallowing therapy, dietary modification, correct posturing for feeding, advice on safe feeding practices and effortful and voluntary swallowing may help in preventing aspiration and improve dysphagia. In intractable cases alternative feeding methods (nasogastric or enteral feeding) may have to be employed. Efficient nursing care is one of the crucial aspects of management in these patients.

## REFERENCES

1. Rofes L, Vilardell N, Clavé P. Post-stroke dysphagia: progress at last. *Neuro gastroenterol Motil*. 2013;25(4):278-82.
2. Arnold W, Nager F. Dysphagia: definition. *Ther Umsch*. 1991;48(3):135-8.
3. Singh S, Hamdy S. Dysphagia in stroke patients. *Postgrad Med J*. 2006;82(968):383-91.
4. Kumar S, Selim MH, Caplan LR. Medical complications after stroke. *Lancet Neurol*. 2010;9(1):105-18.
5. Armstrong JR, Mosher BD. Aspiration Pneumonia After Stroke: Intervention and Prevention. *The Neurohospitalist*. 2011;1(2):85-93.
6. Lee KM, Kim HJ. Practical Assessment of Dysphagia in Stroke Patients. *Annals of Rehabilitation Medicine*. 2015;39(6):1018-1027.
7. Leder SB. Gag reflex and dysphagia. *Head Neck*. 1996;18(2):138-41.
8. Rugiu M. Role of videofluoroscopy in evaluation of neurologic dysphagia. *Acta Otorhinolaryngologica Italica*. 2007;27(6):306-316.
9. Sasaki CT, Burrell MI. Fiberoptic endoscopic evaluation of dysphagia to identify silent aspiration. *Dysphagia*. 1998 Winter;13(1):19-21.
10. Gordon C, Hewer RL, Wade DT. Dysphagia in acute stroke. *Br Med J (Clin Res Ed)*. 1987;295(6595):411-4.
11. Yeom J, Song YS, Lee WK, Oh B-M, Han TR, Seo HG. Diagnosis and Clinical Course of Unexplained Dysphagia. *Annals of Rehabilitation Medicine*. 2016;40(1):95-101.
12. Nilsson H, Ekberg O, Olsson R, Hindfelt B. Dysphagia in stroke: a prospective study of quantitative aspects of swallowing in dysphagic patients. *Dysphagia*. 1998 Winter;13(1):32-8.
13. Hills T, Walsh M. A prospective study into the incidence of aspiration and dysphagia in acute stroke patients admitted to Beaumont Hospital. *BMC Proceedings*. 2015;9(Suppl 7):A13.
14. Martino R, Foley N, Bhogal S. Dysphagia after stroke incidence, diagnosis, and pulmonary complications. *Stroke*. 2005;36(12):2756-276.
15. Parker C, Power M, Hamdy S, Bowen A, Tyrrell P, Thompson DG. Awareness of dysphagia by patients following stroke predicts swallowing performance. *Dysphagia*. 2004;19(1):28-35.
16. Boczek F. Patients' awareness of symptoms of dysphagia. *J Am Med Dir Assoc*. 2006;7(9):587-90.
17. Shaker R, Geenen JE. Management of Dysphagia in Stroke Patients. *Gastroenterology and Hepatology*. 2011;7(5):308-332.
18. Coleman ER, Moudgal R, Lang K, et al. Early Rehabilitation After Stroke: a Narrative Review. *Current atherosclerosis reports*. 2017;19(12):59.
19. Cohen DL, Roffe C, Beavan J, Blackett B, Fairfield CA, Hamdy S, Havard D, McFarlane M, McLaughlin C, Randall M, Robson K, Scutt P, Smith C, Smithard D, Sprigg N, Warusevitane A, Watkins C, Woodhouse L, Bath PM. Post-stroke dysphagia: A review and design considerations for future trials. *Int J Stroke*. 2016;11(4):399-411.
20. Liu H, Shi Y, Shi Y, Hu R, Jiang H. Nursing management of post-stroke dysphagia in a tertiary hospital: a best practice implementation project. *JBIG Database System Rev Implement Rep*. 2016;14(7):266-74.

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