Original Article

A Common Cause of Aspiration Pneumonia in Stroke Patients: Dysphagia

Aspiration Pneumonia in Stroke

Nighat Jamal[1], Mohsin Khan[1], Abdul Rauf[1], Niama Khan[2], Saif ud Din[1] and Faiza Khan[3]

ABSTRACT

Objective: To estimate the frequency of aspiration pneumonia in post stroke patients with the use of dysphagia screen and to analyze the associated risk factors.

Study Design: Cross-sectional study

Place and Duration of Study: This study was conducted at the Ayub teaching hospital, Abbottabad from May, 2018 to October, 2018.

Materials and Methods: The study included patients diagnosed with hemorrhagic and ischemic strokes, who developed dysphagia later. The studied population included samples from both sexes (males and females) with the age group of 35 and above. Detailed history and examination findings were recorded, CT scan brain was performed to confirm the diagnosis of stroke. Chest x-ray and complete blood count were performed for the patients who developed signs and symptoms of pneumonia.

Results: A total of 100 cases that developed post-stroke dysphagia were analyzed for the study. Results revealed that 66% of the patients were diagnosed with ischemic stroke, whereas, 34% were diagnosed hemorrhagic stroke. 54% of patients developed aspiration pneumonia during hospital stay. Among patients with aspiration pneumonia 88% (48) had dysphagia.

Conclusion: A high frequency of occurrence of aspiration pneumonia in post stroke patients is observed. Therefore, early assessment of dysphagia before oral intake in all stroke patients is advised to prevent aspiration pneumonia.

Key Words: Aspiration Pneumonia, Dysphagia Assessment, Stroke.

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INTRODUCTION

Stroke is one of the leading causes of mortality and morbidity.[1] A recently published survey on frequency of stroke associated Pneumonia in Pakistan estimated 21.8% cases had a stroke and/or Transient Ischemic attack and stroke-specific fatalities ranged from 7% to 20%.[2]

Lower respiratory tract infections are a frequent cause of stroke complication with adverse effect on the treatment outcome[3].

Stroke Associated Pneumonia (SAP) is a principal cause for aggravation of post-stroke condition and it refers to the infective pulmonary parenchymal inflammation in stroke patients who developed this condition after stroke without any previous pulmonary infection.[4]

Pneumonia is a common medical consequence seen in the majority of patients with supratentorial ischemic infarction within 30 days of the onset of the disease, as well as a common and substantial cause of fever in the first 48 hours after an acute stroke.[5]

Many clinicians wanted to find a way to avoid post stroke pneumonia and its consequences because of high mortality and disability rate linked with SAP. Patients with severe stroke and high handicap, dysphagia, severe dysarthria or aphasia, poor consciousness, pharmaceutical stomach acid suppression, advance age, atrial fibrillation and diabetes mellitus are more likely to develop SAP.[6] In a study conducted on post stroke complications, pneumonia was diagnosed in 6.9% of the patients with a 3-fold rise in 30-day mortality[6]. Dysphagia which facilitates aspiration of ingested food liquids or oral secretions is regarded as the key risk factor for pneumonia following stock. There is also evidence of reduction in the incidence of pneumonia due to the treatment of dysphagia.[7]

Given this, it appears that early fasting and dysphagia screening at admission remain the most effective interventions for avoiding pneumonia in patients with acute stroke, with formal procedures (sheet check and water solubility test) being connected to a 3-fold reduced incidence of SAP[8].

[1.] Department of Medicine / Gynee and Obstet[2], Ayub Teaching Hospital, Abbottabad.
[3.] Women Medical and Dental College, Abbottabad.

Correspondence: Dr. Abdul Rauf, Associate professor and Head of Department of Medical D unit Ayub Teaching Hospital, Abbottabad.
Contact No: 03335036847
Email: abdulraufa646@gmail.com

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This a regardless of clinical severity, it is appropriate to test all patients swallowing functions prior to delivering oral drugs or food[9]. There exist several practical methods that can help decrease the complications of dysphagia, for example, viscosity changes to food and liquids, postural adjustments, oropharyngeal exercises, thermal simulation, swallowing maneuvers and enteral feeding, by managing the swallowing dysfunction.

The study on common causes of aspiration pneumonia in stroke patients is of great value because aspiration is most common cause of mortality in stroke patients[10]. This study was conducted to determine the common cause and frequency of aspiration pneumonia in stroke patients.

MATERIALS AND METHODS

It was a descriptive cross-sectional study, carried out in Ayub Teaching Hospital, Abbottabad, from May 2018 to oct 2018. Early onset pneumonia following stroke has been referred to as post stroke pneumonia. we will utilize the progressively infiltrating lesions in post-stroke chest X ray and more than two of the clinical signs of infection listed below are required for this criterion to identify stroke-associated pneumonia (1) Fever of 38°C; (2) recently occurring cough, cough with sputum, or worsening of chest symptoms associated with an underlying respiratory illness (3) signs of pulmonary consolidation and/or wet rales; and (4) WBC more than $10\times10^9/L$[11].

After informed consent, a detailed medical and personal history was taken. In all the diagnosed cases of stroke (both ischemic and hemorrhagic) that developed dysphagia, detailed medical examination was done for signs of pneumonia. Later on, full blood count and serial Chest X-ray was performed on all those patients with signs and symptoms of pneumonia to confirm the diagnosis. On the day of admission, a skilled physician validated the patient's dysphagia by performing provocation test for swallowing[12]. Inclusion criteria were patients both male and female (age 35 and above), diagnosed with hemorrhagic and ischemic stroke, who developed dysphagia. Exclusion criteria were diagnosed cases of stroke (both ischemic and hemorrhagic) who can take orally, without dysphagia, and all those cases with history of recent pneumonia preceding stroke. Moreover, deeply comatose patient with Glasgow coma scale (GCS) less than 7 were not included in study. Data was entered and analyzed using SPSS version 21. Statistical package of social sciences is used to analyze the data, keeping confidence interval of 95% and p-value of <0.05.

RESULTS

A total of 100 cases of stroke were included in the study (n=100). Out of these 52% were males and 48% were females. Age group range was from 35 to 95 years. The mean age of the sample was 50 years. Distribution of stroke by age group is shown in figure 1. Out of all patients 66 patients (66%) had acute ischemic stroke and 34 cases (34%) had hemorrhagic stroke. Number of patients who developed aspiration pneumonia was 54%. On clinical assessment, 90% ischemic stroke patients with aspiration pneumonia had dysphagia while 88% hemorrhagic stroke with aspiration pneumonia had dysphagia as shown in table 1. Conscious level of stroke patients shown in Table 2.

Table No.1: Showing Dysphagia Frequency in Pneumonia Patients

STROKE TYPE	FREQUENCY (n=100)	ASPIRATION PNEUMONIA	DYSPHAGIA
Ischemic	66 (66%)	20 (37%)	18 (90%)
Hemorrhagic	34 (34%)	34 (63%)	30 (88%)
Total	100 (100%)	54(54%)	48/54 (89%)

Table No.2: Type of Stroke and Conscious Level of Patients

Conscious level	
Type	**Frequency (%)**
Alert (GCS ≥14)	3
Stupors (GCS 7-10)	44
Drowsiness (GCS 11-13)	53

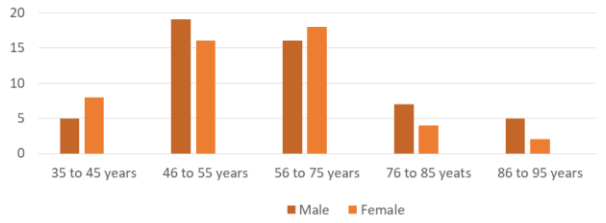

Figure No. 1: Distribution of Stroke according to Age

DISCUSSION

Stroke is the third most leading cause of death worldwide and the most common cause of death in stroke patients is aspiration pneumonia. Approximately 40 to 70% of stroke patients with dysphagia developed silent aspiration, which led to complications like aspiration pneumonia [13,14]. The intrinsic component highlighted by present study is frequency of aspiration and contribution of dysphagia in aspiration pneumonia.

The mean age of patients presented with stroke is 53 years, which is slightly younger than reported by IMRAN M et al, a study conducted in Khyber Teaching Hospital, Peshawer[15]. The difference could be due to selection bias, as comatose patients with GCS less than 7 were excluded from our study because it is difficult to access dysphagia clinically in comatose patients. Male gender slightly predominates over the female gender. In present study about two third cases are of ischemic stroke; these results are in accordance to study done in Iran by Khosravi A et al [10] and by IMRAN M et al. we observed that 54% individuals developed aspiration pneumonia which is quite higher than reported by

IMRAN M et al but an American study reported 40.1% which is near to our observation[16]. In another study of acute stroke patients suffering from dysphagia and requiring tube feeding, the incidence of pneumonia was reported as 44%[17].

Aspiration is most usually induced by dysphagia caused by a stroke and/or reduced degree of consciousness, resulting in an impaired cough reflex and glottis closure[18]. Dysphagia also prolongs the hospital stay as compared to the non-dysphagia group with stroke.[19] The maximum range of dysphagia reported by Sørensen RT et al is 74%[20]. In current study the rate of dysphagia is recorded as 89%, which is quite high and is found to be the most common cause of aspiration pneumonia in stroke patients. The reason for the high prevalence of dysphagia could be the acute phase of stroke as time passed dysphagia resolved in some patients. Another study done at National Taiwan University Hospital also reported 81% cases of aspiration pneumonia in the acute setting of brain stroke[21]. Dysphagia screening at the time of admission in stroke patients can prevent overt and silent aspiration pneumonia[20]. This also reduces hospital stays and mortality in these patients.

CONCLUSION

Frequency of Post stroke aspiration pneumonia is very high in hemorrhagic stroke in acutely hospitalized patients. The majority of stroke patients with aspiration pneumonia have underlying dysphagia on clinical examination. Early dysphagia screening at time of admission can prevent strokes patient from lethal complication of aspiration pneumonia.

Author's Contribution:

Concept & Design of Study:	Nighat Jamal
Drafting:	Mohsin Khan, Abdul Rauf
Data Analysis:	Niama Khan, Saif ud din, Faiza Khan, Mehreen Afsar Jadoon
Revisiting Critically:	Nighat Jamal, Mohsin Khan
Final Approval of version:	Nighat Jamal

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Roger VL, Go AS, Lloyd-Jones DM, Benjamin EJ, Berry JD, Borden WB, et al. Heart disease and stroke statistics—2012 update: a report from the American Heart Association. Circulation 2012; 125(1):e2-20.
2. Adrees M, Rasool S, Ahmad N. Frequency of stroke associated pneumonia in stroke patients. Annals of Punjab Medical College (APMC) 2017; 11(2):154-7.
3. Koennecke HC, Belz W, Berfelde D, Endres M, Fitzek S, Hamilton F, et al. Factors influencing in-hospital mortality and morbidity in patients treated on a stroke unit. Neurol 2011;77(10):965-72.
4. Smith CJ, Kishore AK, Vail A, Chamorro A, Garau J, Hopkins SJ, et al. Diagnosis of stroke-associated pneumonia: recommendations from the pneumonia in stroke consensus group. Stroke 2015; 46(8):2335-40.
5. Li L, Zhang LH, Xu WP, Hu JM. Risk assessment of ischemic stroke associated pneumonia. World J Emerg Med 2014;5(3):209.
6. Rohweder G, Ellekjær H, Salvesen Ø, Naalsund E, Indredavik B. Functional outcome after common poststroke complications occurring in the first 90 days. Stroke 2015;46(1):65-70.
7. Wilson RD. Mortality and cost of pneumonia after stroke for different risk groups. J Stroke Cerebrovascular Diseases 2012;21(1):61-7.
8. Hinchey JA, Shephard T, Furie K, Smith D, Wang D, Tonn S. Formal dysphagia screening protocols prevent pneumonia. Stroke 2005;36(9):1972-6.
9. Powers WJ, Rabinstein AA, Ackerson T, Adeoye OM, Bambakidis NC, Becker K, et al. Guidelines for the early management of patients with acute ischemic stroke: 2019 update to the 2018 guidelines for the early management of acute ischemic stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. Stroke 2019;50(12):e344-418.
10. Khosravi A, Amirifard H, Karami F. Frequency and Causes of Mortality in Patients with Stroke Referred to Zahedan Hospital in 2016. Int J Res Med Sci 2018;6(3):743-6.
11. Horan TC, Andrus M, Dudeck MA. CDC/NHSN surveillance definition of health care–associated infection and criteria for specific types of infections in the acute care setting. Am J Infection Control 2008;36(5):309-32.
12. Teramoto S, Matsuse T, Fukuchi Y, Ouchi Y. Simple two-step swallowing provocation test for elderly patients with aspiration pneumonia. The Lancet 1999;353(9160):1243.
13. Daniels SK, Ballo LA, Mahoney MC, Foundas AL. Clinical predictors of dysphagia and aspiration risk: outcome measures in acute stroke patients. Archives Physical Medicine Rehabilitation 2000; 81(8):1030-3.
14. Miller KE. Using clinical predictors for aspiration risk after stroke. Am Family Physician 2001; 63(3):552.
15. Imran M, Khan AW, Umar M, Khalid R, Khan MI, Ullah N. Frequency of Aspiration Pneumonia in Patients with Stroke.

16. Cogen R, Weinryb J. Aspiration pneumonia in nursing home patients fed via gastrostomy tubes. Am J Gastroenterol (Springer Nature) 1989;84(12).
17. Dziewas R, Ritter M, Schilling M, et al. Pneumonia in acute stroke patients fed by nasogastric tube. J Neurol Neurosurg Psychiatr 2004;75:852-856.
18. Vermeij JD, Westendorp WF, van de Beek D, Nederkoorn PJ. Post-stroke infections and preventive antibiotics in stroke: update of clinical evidence. Int J Stroke 2018;13(9):913-20.
19. Odderson IR, Keaton JC, McKenna BS. Swallow management in patients on an acute stroke pathway: quality is cost effective. Archives of Physical Medicine Rehabilitation 1995; 76(12):1130-3.
20. Sørensen RT, Rasmussen RS, Overgaard K, Lerche A, Johansen AM, Lindhardt T. Dysphagia screening and intensified oral hygiene reduce pneumonia after stroke. J Neurosci Nursing 2013; 45(3):139-46.
21. Meng NH, Wang TG, Lien IN. Dysphagia in patients with brainstem stroke: incidence and outcome. Am J Physical Med Rehabilitation 2000; 79(2):170-5.