

Aspiration Pneumonia in Acute Stroke Patients in Sulaimani City-Iraq

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ABSTRACT

Background and Objectives: Stroke is one of the leading causes of death worldwide. Pneumonia is a major cause of morbidity and mortality after stroke. We aimed to determine the prevalence of aspiration pneumonia in acute stroke patients and the key characteristics that would allow prediction of those patients who are at high risk for post stroke pneumonia.

Patients And Methods: This cross section descriptive study was conducted at Acute Medical Department between (November 2014 to April 2015). One hundred patients (32 female and 68 male), aged between (40-79) diagnosed with stroke were included in this study.

Results: Aspiration pneumonia was significantly higher in ischemic stroke in compare to hemorrhagic stroke (60.9) to (30.1) pvalue=0.001 (because ischemic stroke more common than hemorrhagic type). Forty one percent (41%) of our stroke patients were falling into (60-70) age group. Dysphagia was found in 60% after 3 days of the event. Dysphagia with aspiration pneumonia was found in 83.3 compared with 16 not having aspiration pneumonia P value=0.001.

Conclusion: Significant number of patients post stroke developed aspiration pneumonia. The necessity of a stroke unit is highly appreciated to increase the care and decrease morbidities and mortalities.

KEYWORDS: Aspiration pneumonia, Dysphagia, Prevalence, Stroke.

INTRODUCTION

It is defined as the inhalation of oropharyngeal or gastric contents into the larynx and lower respiratory tract. Aspiration can lead to a broad spectrum of pulmonary diseases such as; airway obstruction, pneumonia, chemical pneumonitis or acute respiratory distress syndrome with significant morbidity and mortality.¹ The content of the aspirate is variable and may comprise secretions, blood, bacteria, liquids, and food particles. Aspiration may be silent. Additionally, it could involve repeated episodes of micro aspiration that rarely cause acute symptoms.² Infections are usually due to a mixture of anaerobes and aerobes in common with the typical flora encountered at the mouth and upper respiratory tract.³ Aerobes play a significant role only when an episode of aspiration has occurred days two weeks before the presentation of pneumonia.⁴

Risk Factors

The combination of an unprotected airway (e.g. In patients with alcohol or drug overdose or seizure disorder) and significant gingivitis constitutes the major risk factor.⁴ There are other risk factors which considered important such as : Problems with swallowing,

esophageal abnormalities (esophageal strictures, neoplasm, diverticulitis), old age, poor gag reflex in people who are not alert (unconscious or semi-conscious) after a stroke or brain injury, gastro esophageal reflux disease⁵, Ethnicity.⁶ Miscellaneous conditions such as protracted vomiting, large volume tube, feeding gastrostomy and the recumbent position.⁷

Clinical Features

Symptoms of this condition are similar to other types of pneumonia. They include; Chest pain , Shortness of breath ,Wheezing, Fatigue, Fever Cough⁸, Purulent sputum, Signs may include tachycardia, tachypnea, decreased breath sounds and dullness to percussion over an area of consolidation, pleural friction rub.⁹ The dependent lobes in the upright position are the lower lobes. However, the aspiration that occurs while patients are in the recumbent position may result in infection in the superior segment of the lower lobes and the posterior segments of the upper lobes.⁷

Diagnosis

Clinicians must consider the diagnosis of aspiration pneumonia when a patient present with risk factors and

radiographic evidence of an infiltrate suggestive of aspiration pneumonia. The location of the infiltrate on chest radiograph depends on the position of the patient when the aspiration occurred.¹⁰ Chest radiography is readily available and inexpensive and is by far the most commonly used imaging test to evaluate aspiration pneumonia. Traditionally, postero – anterior (PA) and lateral chest radiographs have been recommended for imaging aspiration pneumonia and its complications. CT scanning has greater sensitivity and specificity and should be used for more diagnosis aspiration, to determine its cause, and to detect its complications earlier, other investigations include blood tests which should be done and it include complete blood count (CBC) count that may reveal an elevated White blood cell (WBC) count and increased neutrophils, erythrocyte sedimentation rate (ESR), renal function test (RFT).¹¹

Treatment:

Aspiration pneumonia can be treated with intravenous Co-amoxiclav 1.2 g 3 times daily, if anaerobic bacterial infection is suspected, Metronidazol 500 mg 3 times daily should be added. Further modification of antibiotics may be required depending on the clinical response and the microbiological results. Corticosteroids have been used in the treatment of aspiration pneumonitis, but randomized control studies have been unable to demonstrate a benefit of using high-dose corticosteroids.¹⁰

Prevention

- Physical positioning: head of the bed should be placed at 30-45 degrees unless contraindicated (hypotension, orthopedic abnormalities of the spine or hips).
- Oral Intake: modification of oral intake can minimize aspiration.
- Oral care and Cognitive Interventions: for patients with poor dentition, consider dental consultation and intervention.¹²

Stroke

Stroke or cerebrovascular accident (CVA) is a clinical term that describes a sudden loss of neurologic function that is caused by an interruption of blood supply to the brain.¹³ Stroke is the third leading cause of mortality in the United States.

Among approximately 700,000 strokes occurring each year, about 550,000 are first strokes, and about 400,000 strokes are ischemic. Stroke is the leading cause of adult disability with more than 4 million stroke survivors in the United States alone.¹⁴ Incidence of stroke varies among countries and increases exponentially with age. In Western societies, about 80% of strokes are caused by focal cerebral ischemia due to arterial occlusion, and the remaining 20% are caused by hemorrhages.¹⁵ Acute ischemic stroke is caused by thrombotic or embolic occlusion of a cerebral artery and is more common than hemorrhagic stroke.¹⁶ Hemorrhagic stroke occurs when a

blood vessel ruptures and blood accumulates in the tissue around the rupture area.¹⁷ It accounts for approximately 13% of all strokes and it is associated with a mortality rate four times higher than ischemic stroke. 38% of hemorrhagic stroke surviving beyond the first year.¹⁸ Patients with hemorrhagic stroke present with focal neurologic deficits similar to those of ischemic stroke, but tend to be more ill than patients with ischemic stroke.¹⁹

Risk Factors for Stroke: (Modifiable)

- Diabetes
- Hypertension
- Smoking
- Premature vascular Disease
- Hyperlipidemia
- Atrial Fibrillation (AF)
- Transient Ischemic Attack (TIA)
- Recent Myocardial Infarction (MI)
- Congestive Heart Failure.
- Left ventricular ejection Fraction > 25%
- Drugs (sympathomimetics, contraceptive pills, cocaine).²⁰

Other factors associated with a higher risk of stroke include: (**Non modifiable**):

- Family history of stroke.
- Age 55 or older.
- Race: African Americans have a higher risk of stroke than other races.
- Gender: Men have a higher risk of stroke than women.²¹

Aspiration Pneumonia after Stroke

Infection is common following stroke; other studies demonstrate that infection in the post stroke period, especially pneumonia is an independent risk factor for poor outcome.²²

The primary risk factor for pneumonia after stroke is thought to be dysphagia that allows aspiration of ingested food, liquids, or oral secretions. There is evidence that treatment of dysphagia is associated with a reduction in the incidence of pneumonia.²³ Although stroke-induced or pharyngeal dysphasia is a relevant intermediate factor associated with the development of stroke-associated pneumonia (SAP). The role of other risk factors and comorbid conditions is less well studied. A better understanding of the risk factors and early outcomes of SAP may guide the implementation of strategies in organized stroke care provision.²⁴ Respiratory failure from stroke leads to intubation in up to 6% of patients suffering an ischemic stroke and 30% of patients with a hemorrhagic stroke. The application of ventilator support carries its own independent risk of pneumonia.²⁵

Many cases of pneumonia occur after stroke is preventable by appropriate evaluation of swallowing function and modification of oral intake.²⁶

AIM OF THE STUDY

The main aim of our study to know the prevalence of aspiration pneumonia in all types of stroke, with estimation of risk factors for acute stroke in Acute Medical Department.

PATIENTS AND METHODS

Cross sectional descriptive study conducted in the Acute Medical Department, from November 2014 to April 2015. One hundred patients were included in this study {32} were female and {68} were male.

Each patient has a special design questionnaire that includes socio-demographic information, type of stroke, risk factor and information about aspiration pneumonia. Data collection was conducted by direct interviewing. SPSS software version 10 was used for Statistical difference between two proportions, P value 0.001 considered as significant.

Ethical Considerations

Each patient had verbal consent was taken from the patient or relatives.

RESULTS

There were 100 cases of studied samples (ischemic and hemorrhagic stroke), (68male , 32 females), (85%) were unemployed and (15%) were employed. (5%) of studied sample fall into (40-50) age group, (20%) fall into (50-

60) age group,41% fall into (60-70) age group and 34% were above 70 years. There are no patients falls into (30-40) age group or less than 30 years of age as in table 1.

Most of the studied sample (72%) have ischemic stroke, (28%) have hemorrhagic stroke, as in (table 2)

The highly significant association found of Aspiration pneumonia in Ischemic type compared with aspiration pneumonia in hemorrhagic type. In those cases (60%) have dysphagia after 3days, (18%) have dysphagia on admission. Among 78% of dysphasic patients, 65% aspirated and 13% not aspirated, as in table 4 and 5.

Significant association found between dysphagia with positive aspiration pneumonia and dysphagia with negative aspiration pneumonia (P value = 0.001).

The majority of studied samples has aspiration pneumonia (83%); (33%) in the first day of admission, (50%) after 3days and minority (17%) have no aspiration pneumonia after stroke. In our study there were early cases and late cases. We choose 3 days to differentiate between Community Acquired Pneumonia and Aspiration Pneumonia, as in table 6.

According to the site of the pneumonia on the chest x-ray, the right side of the chest was more affected than the left side of the chest. The percentage of right lower lobe was 32%, which is more than the other lobes affected, as in Table 7.

Table 1. Frequencies of studied sample according to the demographic features.

Socio –demographic features	Frequencies	Percentages
Sex		
Male	68	68 %
Female	32	32 %
Occupation		
Unemployed	85	85 %
Employed	15	15 %
Age group		
<30yr	0	0
30-40yr	0	0
40-50yr	5	5 %
50-60yr	20	20 %
60-70yr	41	41 %
>70yr	34	34 %

Table 2. Distribution of studied samples according to the types of stroke.

Types of stroke	Frequencies	Percentages
Ischemic	72	72 %
Hemorrhagic	28	28 %

Table 3. Aspiration pneumonia, according to the type of stroke.

Aspiration pneumonia in both types of stroke	Frequencies	Percent	P value
Aspiration pneumonia in Ischemic type	58	60.9	0.001
Aspiration pneumonia in Hemorrhagic type	25	30.1	
Total	83	100.0	

Table 4. Dysphagia frequencies of studied samples.

Dysphagia	Frequencies	Percentages
Total number of Dysphagia	78	78 %
Dysphagia after 3 days	60	60 %
Dysphagia on admission	18	18 %

Table5. Dysphagia percentages according to the Aspiration pneumonia.

	Frequencies	Percentages	P value
Dysphagia with positive aspiration pneumonia	65	83.3	0.001
Dysphagia with negative aspiration pneumonia	13	16.6	
Total	78	100.0	

Table 6. Aspiration pneumonia of studied samples in the first day of admissions and after 3days.

Aspiration pneumonia	Frequencies	Percentages
Positive on admission	33	33 %
Positive after 3days	50	50 %
Negative	17	17 %
Total	100	100.0

Table 7. Distribution of studied samples according to the radiological findings.

Site of the lesion	Frequencies	Percentages
Right upper lobe	24	28.9
Right middle lobe	8	9.6
Right lower lobe	32	38.5
Left upper lobe	6	7.2
Left lower lobe	13	15.6
Total	83	100.0

DISCUSSION

Aspiration pneumonia after stroke is considered as a major health problem that may lead to death. In this cross sectional study, we found the prevalence of aspiration pneumonia in ischemic stroke (60.9) is higher than hemorrhagic stroke (30.1), P value =0.001 (highly significant rate) because ischemic more common than hemorrhagic but the last type more risky, this is a unique finding and there is no other study confirming this finding.

A National Sentinel Stroke Audit by Royal College of physicians found, the reported incidence of Pneumonia ranges from 3.9 to 45% with a median incidence rate of 7.4%. The most current and valid data available for the United Kingdom is from the National Stroke Audit for England, Wales, and Northern Ireland, which showed incidence rates of 16% in 2008 and 13% in 2010.²⁷

This study revealed that the percentage of aspiration pneumonia is 75% among those above 60 years old. This finding is similar to Longmire's study, which reported increased incidence of aspiration pneumonia with advanced age, which they attributed to reduced immunity and increased comorbidities.²⁸

Dysphagia was a common finding in our study and it was found (78%) from those 83.3 aspirated and 16.6 not aspirated, P value = 0.001 (highly significant). Other study Rockville, MD and Smithland, DG, found aspiration occurs in approximately 40% to 50% of stroke

patients with dysphasia. Dysphasic patients who aspirate are at increased risk of acquiring pneumonia which agrees with our finding.²⁹ Furthermore, Marion et al found most stroke related pneumonias are believed to result from dysphagia and subsequent aspiration of oropharyngeal material or gastric contents. Systematic review of Martino et al showed that dysphagia occurs in 37-78% of stroke patients and increases the risk for pneumonia three folds and eleven folds in patients with confirmed aspiration.³⁰

Finally, Chiu CY, Wong KS, Tsai MH, et al found the right lung is most commonly involved because of the obtuse angle between the trachea and the right main bronchus. The most commonly involved are the right lower and upper lobes because of their dependent location in the supine position.³¹ This is similar to the finding of the present study, where we found the prevalence of right side of the lung (64%) which is higher than the left side of the lung (19%).

CONCLUSION

- Ischemic stroke causes more aspiration pneumonia than hemorrhagic stroke.
- Elderly male affected more than other age group
- The right side of the lung affected more than the left side, especially the right lower lobe.

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