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Original Article

Frequency of Stroke Acquired Pneumonia in Patients Admitted to Intensive Care Unit with Stroke

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ABSTRACT

Stroke is a highly morbid entity, and it can be fatal directly due to neurological damage and affecting the respiratory system or can add to overall morbidity and mortality due to its associated complications like stroke-associated pneumonia (SAP). **Objective:** To investigate the prevalence of stroke-associated pneumonia in ICU patients. **Methods:** A descriptive case series was conducted at Faisalabad Medical University **from** October 2020 to April 2021. In this study, the cases of either gender suffering from stroke within 12 hours were included. SAP was labelled on the basis of fever, cough, and non-homogenous opacities on chest X-ray. **Results:** In the present study, 160 cases of stroke were included, and out of these 82 (51.25%) were males and 78 (48.75%) females. The mean age of the subjects was 54.24±7.15 years and the mean duration of stroke was 7.05±2.54 hours. There were 35 (21.88%) cases that had DM, 28 (17.50%) had HTN and 30 (18.75%) of cases had a history of smoking. In 20 (12.50%) of the patients, SAP was discovered. With a p= 0.34, SAP was found in 12 (15.38%) female patients compared to 8 (9.75%) male cases. With a p= 0.15, SAP was more common in instances with DM, where it was detected in 7 (20%) of the cases compared to 13 (10.4%) in cases without DM. SAP was found in 5 (17.85%) instances of HTN and 4 (13.33%) cases of smoking history, with p values of 0.35 and 1.0, respectively. SAP was found in 15 (14.42%) patients with a stroke length of 6-12 hours, compared to 5 (8.92%) instances with a stroke duration shorter than this, with a p= 0.45. **Conclusions:** Stroke acquired pneumonia is not uncommon and is seen in more than 1 out of every 10 cases and it is more seen in females and those with a history of DM, HTN, and duration of stroke is 6 to 12 hours, though none of these variables was found statistically significant.

INTRODUCTION

Acute ischemic stroke has a poor prognosis because of the numerous complications that might arise. These complications can be prevented by recognizing the frequency and implementing appropriate treatment options. As many as 4% to 9% of stroke patients will develop pneumonia, which is one of the most prevalent respiratory consequences. Those with acute ischemic stroke and those who require nasogastric tube feeding are more likely to develop stroke-related pneumonia (21% and 44%, respectively) [1,2]. Individuals with SAP have a greater death rate and a worse long-term prognosis than those without pneumonia. Aspiration pneumonia develops within 48 hours of a major stroke and is the most common complication two to four weeks later. Pneumonia and respiratory infection are the most prevalent reasons for a patient's readmission to the hospital in the first five years after a stroke [2,3]. A total of 412 people who had had an acute stroke were included in this prospective investigation. SAP is more likely to occur in those over the age of 65 who have dysarthria or aphasia as well as cognitive impairment and an unsatisfactory water swallow test. 124 individuals with acute stroke were the subjects of prospective research in the critical care unit. Mechanical ventilation, an abnormal chest X-ray on entry, and dysphagia were all risk factors in this research. Nasogastric feeding was necessary for patients with facial palsy and diminished consciousness, which put them at risk for developing pneumonia [3,4]. Several studies show that

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suppressing stomach acid with H2 receptor antagonists or proton pump inhibitors increases the risk of HAP. These medications were prescribed to 80% of acute stroke patients, with 17% developing hospital-acquired pneumonia. The incidence of hospital-acquired pneumonia was significantly higher in the acid-suppressive drug group than in the non-acid-suppressive drug group (21 Vs 4 percent, adjusted odds ratio 2.3, 95 percent CI 1.2-4.6) [5]. Most of the SAP is the result of aspiration of stomach material. Fluid, particulates, or endogenous secretions can cause aspiration pneumonitis if they enter the lower airways in an aberrant manner. Aspiration of microbes from the mouth or nasopharynx causes pneumonia. Stroke-related motor and sensory dysfunction in deglutition or diminished awareness can lead to aspiration pneumonia, which is often characterized by an impaired cough reflex and an ineffective glottic closure [7]. Aspiration pneumonia mainly affects the dependent pulmonary segments [8]. If the patient is lying down, the lower lobes are most likely to be affected; if the patient is upright or semi-upright, the upper lobes are most likely to be affected [9]. Pneumonia occurs within 48 hours of hospitalization in patients at high risk of exposure to multidrug-resistant bacteria (HCAP) [10]. Exposure to antibiotics, chemotherapy, or wound treatment within 30 days of the present illness, or hemodialysis or clinic nosocomial infections are all risk factors for MDR-B exposure in HCAP. The terms nosocomial pneumonia and hospital-acquired pneumonia have been replaced by HAP and VAP (VAP). But nosocomial pneumonia has a place in the pneumonia nomenclature [10]. Avoiding nosocomial infections is vital in critically ill patients' pulmonary therapy, as they are a "tribute to more severe population control" [11]. Pneumonia associated with hospitalization (HAP) is defined as pneumonia that occurs at least 48 hours after admission to a hospital and is associated with a higher risk of exposure to multidrug-resistant pathogens, among other characteristics [6] as well as gram-negative bacteria and viruses [12].

METHODS

A descriptive case series was conducted at Faisalabad Medical University from October 2020 to April 2021. Sample size of 160 cases was estimated using a 95% confidence level, a 5% margin of error, and the predicted proportion of SAP, which was 11.7 percent in stroke patients [5]. Non-probability, consecutive sampling was used. Patients aged 30 – 70 years of either gender presenting within 12 hours of stroke and admitted to ICU were included in this study. Patients with co-morbid conditions like liver problems (AST>40IU, AST>40IU), renal problems (serum creatinine >1.2gm/dl), asthma (on medical record), previous ACS (on medical record), and patients with pneumonia before stroke (on history) within last 1 month of stroke were excluded. After the acceptance from the institutional ethical review committee, patients fulfilling the inclusion criteria were selected from the hospital. Informed consent was obtained. Demographic information like name, age, gender, duration of a stroke, and documented history of hypertension, diabetes, and smoking was also obtained and recorded on a predesigned Proforma. Then patients were admitted to ICU and followed up there for 12 hours. If the patient developed SAP as per operational definition within 12 hours data was collected. All this information was recorded on Proforma. The collected information was entered into SPSS version 21.0 and analyzed through it. The mean and standard deviation (SD) were computed for quantitative characteristics including age and length of stroke. Qualitative variables including gender, diabetes, hypertension, and smoking, as well as the outcome variable, SAP, were analyzed in terms of frequency and percentage. Data was stratified by age, gender, length of stroke, hypertension, diabetes, and smoking to investigate how these factors impacted the outcome variable. The p-value of 0.05 was judged significant in the post-stratification Chi-square test.

RESULTS

In the present study, 160 cases of stroke were included and the mean age of the subjects was 54.24±7.15 years. In the present study, out of 160 cases of stroke, 82 (51.25%) were males and 78 (48.75%) females. and the mean duration of stroke was 7.05±2.54 hours. There were 35 (21.88%) cases that had DM, 28 (17.50%) had HTN, and 30 (18.75%) cases had a history of smoking. SAP was seen in 20 (12.50%) of the cases. SAP was seen in 12 (15.38%) female cases as compared to 8 (9.75%) males with p= 0.34. In terms of SAP, there was no significant difference between age groups (p= 1.0). With a p= 0.15, SAP was more common in instances with DM, where it was observed in 7 (20%) of the cases compared to 13 (10.4%) in cases without DM. SAP was found in 5 (17.85%) instances of HTN and 4 (13.33%) cases of smoking history, with p values of 0.35 and 1.0, respectively. SAP was found in 15 (14.42%) patients with a stroke length of 6-12 hours, compared to 5 (8.92%) instances with a stroke duration shorter than this, with a p= 0.45 (Table 1).

Risk Factors stratification		Stroke Acquired Pneumonia			p-Value
		YES	NO	Total	
Age group	30-49Y	5(11.11%)	40(88.89%)	45(100.0%)	1.0
	50-70Y	15(13.04%)	100(86.96%)	115(100.0%)	
	Total	20(12.5%)	140(87.50%)	160(100.0%)	
Gender	Male	8(9.75%)	74(90.25%)	82(100.0%)	0.34
	Female	12(15.38%)	66(84.62%)	78(100.0%)	
	Total	20(12.50%)	140(87.50%)	160(100.0%)	

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Hypertension	Yes	5(17.85%)	23(82.15%)	28(100.0%)	0.35
	No	15(11.36%)	117(88.64%)	132(100.0%)	
	Total	20(12.5%)	140(87.5%)	160(100.0%)	
Diabetes	Yes	7(20%)	28(80%)	35(100.0%)	0.15
	No	13(10.4%)	112(89.6%)	125(100.0%)	
	Total	20(12.5%)	140(87.5%)	160(100.0%)	
Smoking	Yes	4(13.33%)	26(87.67%)	30(100.0%)	0.35
	No	16(12.3%)	114(87.7%)	130(100.0%)	
	Total	20(12.5%)	140(87.5%)	160(100.0%)	
Duration of SAP	<6 hr	5(8.92%)	51(8.92%)	56(100%)	0.45
	6-12 hr	15(14.42%)	89(85.59%)	104(100%)	
	Total	20(12.5%)	140(87.5%)	160(100%)	

Table 1: Risk Factors Stratification

DISCUSSION

Stroke is a major cause of disability, with high morbidity and death rates, and it may affect a wide range of entities, all of which have a direct or indirect influence on one's existence and quality of life [11-15]. According to a recent poll in Pakistan, 21.8 % of people have had a stroke or a transient ischemic attack [16]. Stroke-related mortality in the United States has been shown to be anywhere from 7 to 20 %. As many as 89 % of stroke patients are incapable of performing everyday tasks on their own, making them more vulnerable to problems. There are several risk factors for stroke in our community, such as diabetes, heart disease, smoking, and hypertension, which are common in other Western nations [16,17]. Following a stroke, pneumonia is one of the leading causes of mortality, along with other medical and neurological problems [18]. SAP is more prevalent in patients with acute ischemic stroke who need nasogastric tube feeding in the neurology critical care unit, at 21% and 44%, respectively. In the first 48 hours following an acute stroke, most pneumonia cases with typical medical implications occur within 30 days of supra-tentorial ischemic infarction [19]. SAP was found in 20 (12.50 %) of the 160 patients hospitalized with a stroke in this research. These findings were similar to those of previous research; nevertheless, there has been a large variation in the incidence of this in the past. In the current study, SAP was found in 12 (15.38 %) female patients compared to 8 (9.75 %) male cases, with a p= 0.34. According to previous studies on stroke patients, the prevalence of SAP ranged from 3.9 to 44 % of individuals referred to stroke units [20]. According to research, SAP was identified in 44 % of patients brought to the ICU with an acute stroke [21]. Another research by The WH et al found that it was present in 11.7 percent of patients [22]. In one research, the overall frequency of SAP was found in 18(18%) of 100 individuals hospitalized with stroke, and there was no significant difference in gender among those who had it, with 51 % of the cases being men and 49 % females. They went on to say that the risk of SAP was highest in instances with older age groups, with 3/4 of the cases being over 50 years old. However, with a p-value of 1.0, there was no significant difference in both age groups in the current investigation [23].

CONCLUSIONS

Stroke acquired pneumonia is not uncommon and is seen in more than 1 out of every 10 cases and it is more seen in females and those with history of DM, HTN and duration of stroke 6 to 12 hours; though none of this variable was found statistically significant.

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