

A Study on Risk Factors Associated with Stroke

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Abstract

Introduction: The majority (about 75%) of cases of stroke occur in people over the age of 65 years and about one-third of patients die of stroke within a year of onset. Over half of survivors remain dependent on others for everyday activities, often with significant adverse effects on caregivers. Medical complications after acute stroke may adversely impact outcome and in some cases may be preventable. Limited data exist regarding the frequency of such complications occurring in the first days after the ictus and the relationship of these complications to outcome.

Methodology: All selected patients were studied for post stroke pulmonary complications mainly pneumonia, mechanical ventilation, respiratory depression, its incidence, age, gender distribution and its association with the site of lesion (i.e Anterior vs Posterior), type of lesion (infarct vs bleed), Severity of the stroke if measured by NIHSS scoring system.

Results: Among smokers 9 out of 29 patients have developed pneumonia that is 47%. But this finding did not show statistical significance. Among 24 Alcoholics 13 patients developed pneumonia with 54% association. but no statistical significance. Diabetic and hypertensives, did not show any significant association with pneumonia and statistical significance.

Conclusion: With other risk factors, there was more incidence of developing pneumonia. but there was no statistical significance and so these are no independent risk factors for pneumonia.

Keywords: Risk factors; Stroke; Co morbidities.

Introduction

Stroke is the second most common cause of death worldwide and a frequent cause of adult disability in developed countries. The majority (about 75%) of cases of stroke occur in people over the age of 65 years, and about one-third of patients die of stroke within a year of onset. Over half of survivors remain

dependent on others for everyday activities.¹

Many factors increase the risk of stroke, and these are generally divided into two categories: modifiable and non-modifiable risk factors. Age, gender, and ethnicity are non-modifiable risk factors for stroke.² Modifiable or potentially modifiable risk factors include a number of physiological and environmental factors and include hypertension,

elevated total cholesterol, smoking, physical inactivity, alcohol consumption, and atrial fibrillation. Stroke mortality data are available from more than 24 countries showing that, in general, rates have declined for several decades. While large national or international stroke mortality data may be used for determining overall burden of fatal strokes and trends in stroke mortality, stroke mortality data are often not accurate (diagnosis classification bias) and have limited value for healthcare planning and organization.³

The results from the World Health Organization (WHO) Monitoring Trends and Determinants in Cardiovascular Disease (MONICA) project suggested that both declining and increasing stroke mortality were principally attributable to changes in case fatality rather than changes in incidence.⁴

As per WHO stroke is 'a clinical syndrome consisting of rapidly developing clinical signs of focal (or global in case of coma) disturbance of cerebral function lasting more than 24 hours or leading to death with no apparent cause other than a vascular origin.

A spectrum of acute lower respiratory tract syndromes complicating stroke, which may or may not meet radiological criteria for pneumonia, and may even be noninfective (eg, aspiration pneumonitis), was considered.

Pneumonia occurs most frequently within the first week of stroke onset, probably reflecting the highest risk period in terms of prevalence of dysphagia, immobility, impaired consciousness, and suppressed immune responses.⁵

A time-limited component to the terminology of SAP was therefore agreed, arbitrarily restricting SAP to the first 7 days after stroke onset. This is not based on pathological or microbiological grounds (as in the case of CAP and HAP), because of insufficient evidence, nor is it indicative of particular antibiotic requirements.⁶

So recommendation is SAP is the preferred diagnostic terminology covering the spectrum of LRTI complicating stroke within the first week. For hospitalized patients beyond 7 days. Chest radiography is frequently normal in the early evaluation of both CAP and HAP.^{36,37} In suspected SAP, typical diagnostic appearances on initial CXR were present in only 36%.⁵ This raises the question as to whether typical CXR changes are mandatory for a diagnosis of SAP. Clinical suspicion of pneumonia, without diagnostic appearances on

initial CXR, may represent a different clinical or pathological LRTI syndrome; an inadequate CXR; a CXR undertaken before evolution of typical diagnostic appearances; early antibiotic initiation averting the development of radiological changes. Consensus was reached that typical CXR changes of pneumonia were not mandatory for the diagnosis of SAP, but could be used as a criterion for differentiating probable from definite SAP, in the absence of routine use of additional imaging (eg, chest ultrasound or computed tomography).^{7,8}

Methodology

Sample size: 100 patients

Methods of collecting the data

All selected patients were studied for post stroke pulmonary complications mainly pneumonia, mechanical ventilation, respiratory depression, its incidence, age, gender distribution and its association with the site of lesion (i.e Anterior vs Posterior), type of lesion (infarct vs bleed), Severity of the stroke if measured by NIHSS scoring system.

As a substudy risk factor – age, gender, dysphagia, smoking, alcoholism and comorbidities – DM, HTN, IHD, RHD were evaluated, comparison and its association with post stroke pulmonary complications were studied.

Detailed history of age, gender, occupation, vitals, risk factors (smoking, alcoholism, dysphagia), comorbidities (DM, HTN) were obtained, clinical examination was done.

Inclusion criteria

All patients admitted within 72 hours of the onset of acute stroke to our ICU/Emergency ward in our institute.

Exclusion criteria:

- Admission more than 72 hours after stroke onset.
- Recent history of cerebrovascular disease (within 3 months)
- Traumatic brain stroke
- Pre existing pneumonia.
- Pre existing dysphagia of varied etiology

Study design: A hospital based, prospective study

Results

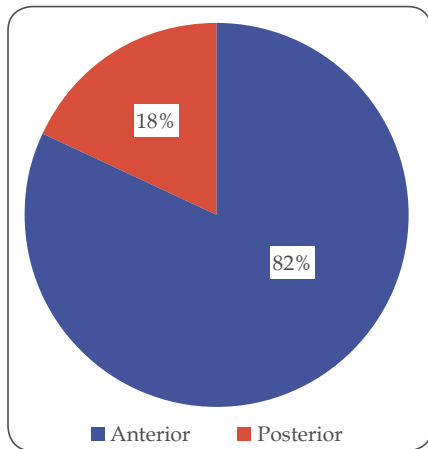


Fig. 1: Details of site of stroke

In 100 patients with CVA, 82% were Anterior Circulation strokes and 18 were Posterior Circulation strokes (Fig. 1)

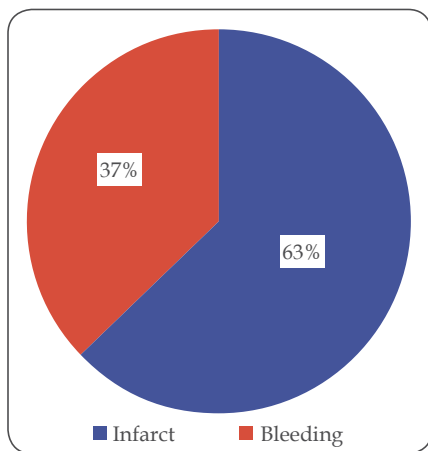


Fig. 2: Type of stroke.

Among 100 patients, 63 patients developed Infarcts and 37 patients developed Bleed (Hemorrhage). (Fig. 2)

Table-1: Risk factors profile of study participants (N=100).

Sl. No.	Feature	Frequency and %
1	Dysphagia	85
2	Smoking	8
3	Alcoholic	13
4	Smoking and alcoholic	11

In 100 patients, 85 patients were having dysphagia and were on ryeles tube feeding (patient who having low GCS and in altered sensorium were considered as having dysphagia), 8 patients were smokers, 13 are alcoholics, 11 were both (table 1).

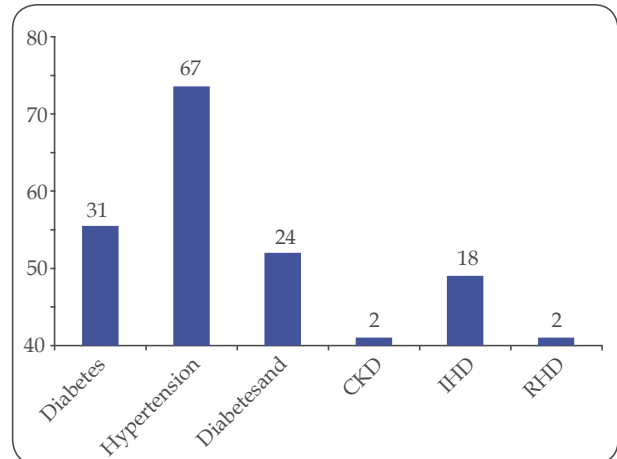


Fig. 3: Co-morbidities of the study participants (N=100).

This table shows the incidence of comorbidities in study population. Among 100 patients, 31 were diabetics and 67 patients were hypertensives and 24 were having both, 18 have IHD, 2 were CKD, 2 were RHD. (Fig. 3)

Table 2: Comparison of risk factors with pneumonia.

Sl. No.	Features	Pneumonia		p value#
		No n (%)	Yes n (%)	
1	Smoking			0.46
	No	50 (61.7)	31 (38.3)	
	Yes	10 (52.6)	9 (47.4)	
	2	Alcoholics		0.10
No	49 (64.5)	27 (35.5)		
	Yes	11 (45.8)	13 (54.2)	
	3	Hypertension		0.60
No	21 (63.6)	12 (36.4)		
	Yes	39 (58.2)	28 (41.8)	
	4	Diabetes		0.25
No	44 (63.8)	25 (36.2)		
	Yes	16 (51.6)	15 (48.4)	
	5	Dysphagia		0.02*
No	13 (86.7)	2 (13.3)		
	Yes	47 (55.3)	38 (44.7)	

Note: # p value based on Chi-square test, * statistically significant (p<0.05)

Among smokers 9 out of 29 patients have developed pneumonia that is 47%. But this finding did not show statistical significance.

Among 24 Alcoholic 13 patients developed pneumonia with 54% association.but no statistical significance.

Diabetic and hypertensives, did not show any significant association with pneumonia and statistical significance.

But dysphagia, has showed statistical significance by having 44% of association. (Table 2)

Discussion

In our study, we studied the association between the factors with pneumonia and found that

- Posterior circulation strokes had more association with development of pneumonia and this finding is statistically significant.
- While comparing association of type of strokes i.e. infarcts vs bleed, frequency wise infarcts have more association with development of pneumonia, though this finding did not show any statistical significance in our study.
- Mechanical ventilation in a patient has more chance of developing pneumonia compared to patients who are not on mechanical ventilation.

We have studied the association of risk factors like DM, HTN, smoking, alcoholism, dysphagia individually with development of pneumonia. It was found that

- 47% of smokers and 31% of patients among non smokers also developed pneumonia.
- 54% of alcoholics and 27% of non alcoholics has developed pneumonia.
- 41% of hypertensive and 36% of non hypertensive developed pneumonia.
- 48% of diabetics and 36% of non diabetic developed pneumonia.
- 44% of patients with dysphagia and only 13% of patient without dysphagia has developed pneumonia.

As per above findings, dysphagia is found to have good association with development of pneumonia and this is statistically significant.

But other factors study showed that there is increased incidence of pneumonia in patients having DM, HTN and alcoholic and smoking. But this finding did not show any statistical significance.

NIHSS scoring was taken as an assessment of severity of stroke, and when its association with the development of pneumonia, it was found that patients with a mean value of 10.5 scores showed increased development of pneumonia.^{9,10}

Conclusion

Risk factors like dysphagia, smoking, alcoholism, diabetes, hypertension were studied for the association with pneumonia and results showed that dysphagia was the single most important risk factor.

But in other risk factors there was more incidence of developing pneumonia in people with these risk factors but there was no statistical significance and so these are no independent risk factors for pneumonia.

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