

Frequency of Atrial Fibrillation in Patients of Ischemic Stroke Presenting in Emergency

Tariq Rafiq¹, Arsalan Nawaz², Sheraz Anjum³, Abid Ali⁴, Muhammad Idrees⁵, Rahat Javaid Khan⁶

¹ Consultant Physician, DHQ Hospital, Narowal Pakistan
Conception of study, Designing and planning

² Assistant Professor, Department of Medicine, UCMD, The University of Lahore, Lahore Pakistan
Manuscript writing and data analysis

³ Consultant Physician, DHQ Hospital, Narowal Pakistan
Study conduction/Data collection

⁴ Senior Registrar, Department of Gastroenterology, Chaudhary Muhammad Akram Teaching Hospital, Lahore Pakistan
Analysis /interpretation and discussion

⁵ Consultant Physician, DHQ Hospital, Narowal Pakistan
Data collection

⁶ Additional Medical Superintendent, DHQ Hospital, Narowal Pakistan
Data analysis and Critical review

CORRESPONDING AUTHOR

Dr. Arsalan Nawaz
Assistant Professor, Department of Medicine,
UCMD, The University of Lahore, Lahore Pakistan
Email: drarslan21@gmail.com

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ABSTRACT

Background: Stroke also known as cerebrovascular accident is sudden onset of neurological deficit due to vascular injury. About 87% of strokes are ischemic, the rest being hemorrhagic. Atrial fibrillation is an arrhythmia in which there is irregularly irregular heart beat which can lead to thrombus formation and then cardioembolic stroke. **Objective:** The study objective was to determine the frequency of atrial fibrillation in patients of ischemic stroke presenting in Emergency Department of the Hospital and its associations. **Study Design:** Retrospective observational study. **Settings:** Department of Medicine, DHQ Hospital Narowal Pakistan. **Duration:** Record of patients presented at DHQ Hospital Narowal from 03-03-2022 to 03-03-2023 reviewed. **Methods:** After taking ethical approval from head of the institution (Ref No. 451/PA-MS) medical record of patients presented with focal neurological deficit at DHQ Hospital Narowal during this period was reviewed. 134 patients who fulfilled the inclusion criteria were included in the study. Information regarding their demographic data was noted in the performa. Record of CT Scan brain plain or report of CT brain and ECG findings were noted. **Results:** Amongst 134 participants, the mean age of participants was noted to be 52.93 ± 16.82 years. There were 44.8% male patients while remaining were females. Hypertension was present in 67.2% patients while 51.5% of patients were smoker. Atrial fibrillation was present in 37.3% patients. By using chi-square test, significant association was observed between presence of atrial fibrillation and gender, different age groups and smoking with p-value < 0.005 . There was no significant association observed between atrial fibrillation and hypertension having p-value > 0.05 . **Conclusion:** Atrial fibrillation was present in 37.3% patients of ischemic stroke presenting in Emergency Department of the Hospital. Effect modifiers have significant effect except hypertension on the presence of atrial fibrillation.

Keywords: Atrial fibrillation, Ischemic stroke, Hypertension, Smoking.

INTRODUCTION

Stroke also termed as Cerebrovascular accident is an acute onset neurological deficit due to vascular injury of central nervous system blood vessels. Stroke may be due to a clot in blood vessel known as ischemic stroke which can due to thrombosis or due to emboli originated outside CNS or stroke may be due to hemorrhage. About 85 % of the stroke is ischemic and remainder is hemorrhagic.¹

According to Global Burden of Disease 2019 statistics, stroke is the second top most cause of mortality globally.² South Asia has also very high prevalence of stroke. According to data the prevalence of stroke in Asia ranges from 45-471 per one lac and urban areas have higher prevalence than rural areas.³ There are scarce data about prevalence of stroke in Pakistan but two studies conducted in Karachi found that stroke prevalence is ranging for 4.8 & 19.1% in Pakistan.⁴

Incidence of stroke in females is greater than the male especially the cardioembolic stroke.^{2,5}

There are multiple known risk factors for ischemic stroke including uncontrolled blood pressure and diabetes mellitus, Ischemic heart disease, lipid disorders, smoking, alcoholism and atrial fibrillation.^{5,6}

Atrial fibrillation is one of the commonest arrhythmias very closely linked to stroke and death. According to Global Burden of Diseases 2.5-3.5% of world population is affected by this.⁷

Atrial fibrillation is the prominent cause of cardioembolic disease leading to ischemic stroke. Quarter of ischemic strokes is attributed to emboli form atrial fibrillation. The pathophysiology of this phenomenon is stasis of blood due to ineffective ventricular contraction which leads to thrombus which then dislodges and traverses to brain leading to ischemic stroke.⁸

OBJECTIVES

The study objective is to determine the frequency of atrial fibrillation in patients of ischemic stroke and its associations presenting in Emergency Department of DHQ Hospital Narowal.

METHODS

It was a retrospective observational study conducted at DHQ Hospital Narowal.

Patients above Pediatric age group (18-85 years), both genders and patients with ischemic stroke (as per operational definition) presented in emergency department of the hospital were included in the study

Patients who refuse to participate in study and the patients with hemorrhagic stroke. (hypodense area on CT brain) were excluded from the study.

Sample size is 134, Calculated from win-pepi to estimate a proportion with confidence level = 95%, margin of error = 0.08 and assumed proportion of atrial fibrillation= 0.334

Sampling technique used was non probability, consecutive sampling.

After taking ethical approval from head of the institution (Ref No. 451/PA-MS) medical record of patients from 03-03-2022 to 03-03-2023 presented with focal neurological deficit at DHQ Hospital Narowal during this period was reviewed.134 patients who fulfilled the inclusion criteria were included in the study. Information regarding their demographic data was noted in the performa. Record of CT scan brain plain or report of CT brain and ECG findings for atrial fibrillation were noted.

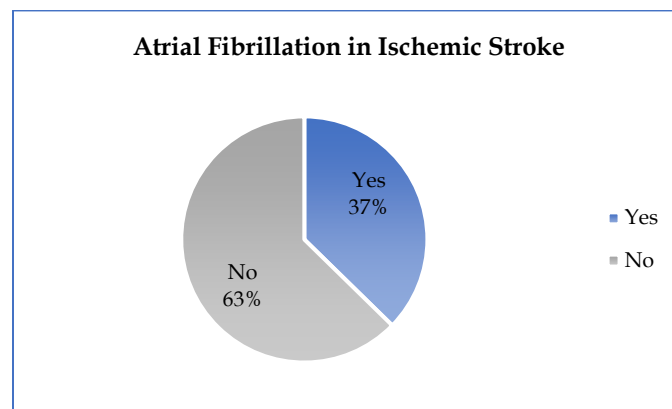
Confounding variables like age, gender, duration of stroke were noted.

SPSS version 23.0 was used to analyze the data. Numerical variable i.e. age was expressed as mean and standard deviation. Qualitative variables like gender, hypertension, smoking and presence of atrial fibrillation were expressed in the form of frequency and percentages. Different variables of data were stratified like age, gender, hypertension and smoking. To determine the statistical significance of different variables, Chi-square test was applied and P-value ≤ 0.05 was used as statistically significant value.

RESULTS

Among 134 participants, the mean age of the patients was 52.93 ± 16.82 years. There were 60 (44.8%) male patients while female patients were 74 (55.2%). A significant proportion of patients (67.2%) were hypertensive. There were 69 (51.5%) smoker patients and 65 (48.5%) non-smoker patients. Atrial fibrillation was present in 50 (37.3%) patients while atrial fibrillation was absent in 84 (62.7%) patients. Figure 1.

Figure 1: Atrial Fibrillation in ischemic stroke



By using chi-square test, statistically significant association was observed between presence of atrial fibrillation and gender, different age groups and smoking with p-value < 0.005. There was no significant association observed between presence of atrial fibrillation and hypertension having p-value = 0.194. (Table -1)

Table 1: Cross tabulation of atrial fibrillation with different risk factors (n=134)

		Atrial Fibrillation		P value
		Present (50)	Absent (84)	
Age	≤ 40 years (n=43)	22 (51.2%)	21 (48.8%)	0.023
	> 40 years (n=91)	28 (30.8%)	63 (69.2%)	
Gender	Male (n=60)	33 (55%)	27 (45%)	0.000
	Female (n=74)	17 (22.97%)	57 (77.02%)	
Hypertension	Yes (n=90)	37 (41.11%)	53 (58.89%)	0.194
	No (n=44)	13 (29.54%)	31 (70.45%)	
Smoking	Yes (n=69)	45 (65.21%)	24 (34.79%)	0.000
	No (n=65)	5 (7.69%)	60 (92.31%)	

DISCUSSION

Atrial fibrillation which is most common arrhythmias encountered on emergency floor is a major risk factor for cardioembolic stroke. Atrial fibrillation not just increases the risk of stroke but also associated with significant morbidity and mortality in stroke patients.⁹

The prevalence of atrial fibrillation is between 2.5 to 3.5 % in general population while in patients presented with stroke its prevalence is found to be variable ranging from 15 to 38%.

Data from a Swedish study by Friberg *et al* found its prevalence to be 33.4% which is comparable to our study where prevalence of Atria fibrillation is 37.3% patients.¹⁰ While A study by Fatah *et al* found the prevalence to be 17.6 % while some older studies reported the range from 15 to 21% which are different form our study.¹¹ The reason for wide range of prevalence of atrial fibrillation may be due to difficulty in detecting paroxysmal atrial fibrillation which is usually missed if it is not present at the time of presentation.

Age is also closely related with presence of atrial fibrillation. A study by Johansen *et al* showed that incidence of atrial fibrillation increases to 27.5 in patients who are more than 80 years old which 4 % in younger population.¹² While our study showed that more younger patients have atrial fibrillation as compared to the patients who were above 40 years of age which is contrary to the study by Johansen *et al*.¹² The reason might be early presentation and diagnosis of atrial fibrillation but this is an interesting finding which needs more studies to look into its generalizability and factors of it. A study by Fatah *et al* found no significant difference between atrial fibrillation and age which also contrary to our study.¹¹

Incidence of atrial fibrillation is more in males however in older patients incidence is higher in females. According to article published in Springer 2020, it is 1.6 cases per 1000 per year for females as compared to 3.8 per 1000 per year for males. This data is comparable to our data where prevalence of atrial fibrillation is higher in male population which is also clinically significant.¹³ Although an Indian study by Bhana *et al* found that prevalence is higher in females which is contrary to our study.¹⁴

The study by Fatah *et al* showed that there was no clinically significant difference observed between atrial fibrillation and smoking. Atrial fibrillation was present in 26 % of smokers while 22% of nonsmokers did not had atrial fibrillation while in our study 65% of smokers had atrial fibrillation and we found a very significant clinical difference between smokers and nonsmokers which is contrary to study by Fatah *et al*.

Hypertension is strongly associated with atrial fibrillation.¹⁵ Data by Dzekshka *et al* showed that patients with hypertension have 1.7 times high risk of developing atrial fibrillation .¹⁶ While study by Fatah *et al* did not find any clinical significant difference between hypertension and atrial fibrillation. These findings are comparable with our findings. Our study also shows no significant difference between hypertension and atrial fibrillation.

CONCLUSION

Atrial fibrillation was present in 37.3% patients of ischemic stroke presenting in Emergency Department. Effect modifiers have significant effect except hypertension on the presence of atrial fibrillation.

LIMITATIONS

This study was a single center study with relatively small sample size and conducted in a resource limited facility. Also, the mortality and morbidity in stroke due to atrial fibrillation was noted.

SUGGESTIONS / RECOMMENDATIONS

Further studies with a large sample size and including other factors and follow-up studies for determining the morbidity and mortality should be conducted.

CONFLICT OF INTEREST / DISCLOSURE

No conflict of interest present & nothing to disclose.

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