

FREQUENCY OF ATRIAL FIBRILLATION IN PATIENTS WITH ACUTE ISCHEMIC STROKE

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ABSTRACT

Background: Atrial fibrillation (AF) is important but treatable causes of disabling ischemic stroke like other modifiable risk factors it also need early identification and appropriate management to prevent stroke occurrence and recurrence. However intermittent, silent AF makes it difficult to estimate the accurate prevalence of this potentially treatable cause of ischemic stroke. Atrial fibrillation may be the first presentation of ischemic stroke and stroke recurrence in spite of good compliance with antithrombotic therapy, such patients need appropriate protection and should be simultaneously evaluated for other risk factors moreover such subjects are considered as high risk for stroke recurrence, **Objective:** To Establish the frequency of atrial fibrillation in acute ischemic stroke patients visiting Liaquat University hospital. **Material and method:** This is descriptive cross sectional study conducted at Neurology department of Liaquat University of medical and health sciences Jamshoro from 25th November 2017 to 25th July 2020. The Data was collected by non-probability consecutive sampling technique. Patients with acute ischemic stroke of both gender of age between 30-80 years were included in the study. **Results:** A total of 112 patients with acute ischemic stroke were included. 66 patients (58.9%) were male & 46 (41.1%) were female, with the mean age of 55.34±8.17 years. Mean BMI was 32.56±4.35 kg/m². 9 patients (8%) had family history of atrial fibrillation, while 12 (10.7%) had family history of ischemic stroke. The outcome (atrial fibrillation) was seen in 16 patients (14.3%). **Conclusion:** In conclusion frequency of AF among patients with acute ischemic stroke is 14.3%, more in male gender. **Key Words:** atrial fibrillation, ischemic stroke, antithrombotic

How to cite this article: Qurat ul Ain¹, Kumar R², Bughio AH³, Ansari SJ⁴, Larik AB⁵, Memon S⁶.

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JPUMHS; 2021;11:01,43-47.

<http://doi.org/10.46536/jpumhs/2021/11.01.289>

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Received on Fri, Dec 11, 2020, Accepted On 15 March 2021, Published On 31 March 2021

INTRODUCTION

Atrial fibrillation (AF) is most common modifiable risk factor for ischemic stroke and increases risk from 4- to 5-fold. The risk of stroke with AF increases with age, from 1.5% for those aged 50 to 59 years to nearly 25% for those aged ≥80 years^{1,2}. Patient with AF can develop stroke either from an embolism or from hemodynamic disorder associated with heart rhythm³, as the risk of both stroke and AF increases with age, it is anticipated that the number of patients presenting with an acute stroke and concomitant AF will increase. A prior study indicated that AF was a predictive factor for severe stroke and early death⁴. In ischemic stroke patient with AF the chances of recurrence of stroke increases from 10-20% in next 1-2 years and mortality rate is also doubled⁵. A study conducted by Saposnik G, et al⁶ in 2013 reported the prevalence of atrial fibrillation (17.2%) in patients with ischemic stroke. Two other studies from India by Akanksha WG et al⁷ and Goel D⁸, et al reported the prevalence rate of atrial fibrillation in acute ischemic stroke of 10

and 25% respectively. In another cross-sectional study conducted in Iran by Sadeghi R, et al⁹ reported the 11.1% prevalence of AF among 900 hospitalized patients with the diagnosis of ischemic brain stroke; in such patients, a cardiac embolus most commonly originating from the left atrium is a common cause of ischemic stroke. As a result, patients with atrial fibrillation who suffer from ischemic stroke appear to have a worse outcome including more disability and greater mortality than those who have an ischemic stroke in the absence of atrial fibrillation¹⁰. Moreover, AF is an independent predictor of mortality and also associated with poorer outcomes among stroke patients. Ischemic stroke is common in patients with atrial fibrillation either as the initial presenting manifestation of atrial fibrillation or despite appropriate antithrombotic prophylaxis. In such patients, a cardiac embolus most commonly originating from the left atrium is a common cause of ischemic stroke. As a result, patients with atrial fibrillation who suffer from ischemic stroke appear to have a worse outcome including more disability and greater mortality than those

who have an ischemic stroke in the absence of atrial fibrillation¹¹⁻¹³. This cardio embolic stroke occurs when stagnant blood in the fibrillating atrium forms a thrombus that embolizes to the circulation, blocking arterial blood flow and causing ischemic injury¹⁴. The rationale of the study is to measure the frequency of in-hospital new onset atrial fibrillation in patients presenting with acute Ischemic stroke in our population as large number of our population belongs to rural areas and poor socio economic status therefore mostly patients reported very late due to lack of medical facilities and financial constraints as compare to other developed countries. Therefore, it is important to investigate this common modifiable risk factor of ischemic stroke so as to treat it early to prevent disability and death from recurrent stroke.

MATERIAL AND METHODS:

This is descriptive, cross sectional study was conducted at department of neurology, Liaquat University hospital Jamshoro/Hyderabad from 25th November 2017 to 25th July 2020. The data was collected by non-probability consecutive sampling technique. Patients with acute ischemic stroke of either sex between the ages of 20 to 80 years were included in study. On the other hand, patients with transient ischemic attack (TIA), hemorrhagic stroke or venous sinus thrombosis [If focal neurological deficit (assess clinically) resolve within 24 hours and no sign of infarct on CT], epileptic seizure with postictal symptoms or patient is already on antithrombotic drugs like heparin or warfarin were excluded. The sample size were 112 patients, calculated by 17.2%⁸ prevalence of AF in ischemic stroke with 95% confidence level and 7% margin of error. Operationally the acute ischemic stroke was defined by the presence of sudden onset focal neurological deficit (like numbness, weakness or paralysis of limbs, slurred speech, blurred vision and/or confusion) of more than 24 hours duration and confirmed with hypodense lesion on computerized tomography (CT) of brain and atrial fibrillation with presence of all three of the following on standard 12-lead ECG (1)absent P wave, (2) replacement of P waves by rapid

FIGURE – 1

oscillations of fibrillatory waves of varying size, shape, and interval between two consecutive waves & (3) an irregular ventricular response.

The data was collected after permission of institutional ethical committee. The written informed consent was taken from every patient or their caregiver after explaining the purpose and benefits of the study. The data was analyzed using SPSS version 20. Mean and SD was calculated for quantitative variable like age and duration of acute ischemic stroke. Frequencies and percentages was calculated for categorical variables like gender, family history of (AF, ischemic stroke) and outcome variable i.e. A.F (yes/no). Data was stratified on the basis of age, gender, family history of (AF, ischemic stroke) and duration of acute ischemic stroke to see the effect of these on outcome variables. Post stratification Chi-Square was applied using $P \leq 0.05$ as significant.

RESULTS

A total of 112 patients with acute ischemic stroke were selected to conduct this study of these 66 (58.9%) patients were males & 46 (41.1%) patients were females.

The age of the patients ranged from 35 to 75 years Fig.1 (mean55.34±8.17 years). The age was stratified in two groups. The atrial fibrillation were more in age group 35-55(8.03%) compared with 56-75(6.25%) as shown in (Table-1)

Out of 112 patient of ischemic stroke, atrial fibrillation was found in 16 patients (14.3%) and of these 6(5.4%) were female and 10(8.9%) were male with p-value 0.75 as shown in (Table-2)

In our study 9 patients (8%) had family history of atrial fibrillation of which 3(2.7%) were female and 6 (5.4%) as shown in (Table-3)

In our study the mean BMI was 32.56±4.35 kg/m The BMI was stratified in two groups. The group with BMI 25-33 Kg/m, the atrial fibrillation was found in 9(8.03%) patients and the group with BMI 34-40 Kg/m, the atrial fibrillation was found in 7(6.03%) patients as in (Table-4)

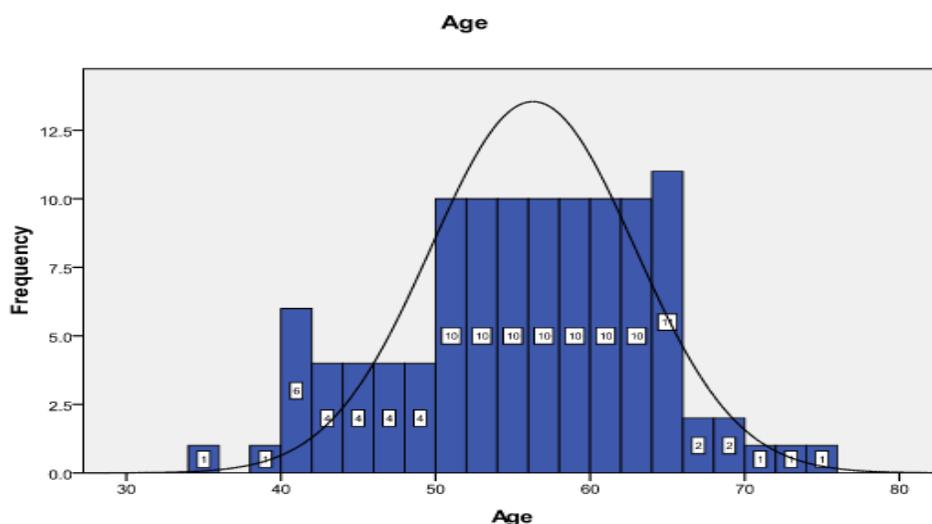


Table-1 Age wise distribution of patients with atrial fibrillation (n=112)				
AGE	OUTCOME(ATRIAL FIBRILLATION)		TOTAL	P-value
	NO	YES		
35-55 YEARS	43(38.39%)	9(8.03%)	52(46.42%)	***0.474
56-75 YEARS	53(47.32%)	7(6.25%)	60(53.57%)	
TOTAL	96(85.71%)	16(14.28%)	112(100%)	

Chi Square test was applied.

Table-2 Gender wise distribution of patients with atrial fibrillation (n=112)				
GENDER	OUTCOME(ATRIAL FIBRILLATION)		TOTAL	P-value
	NO	YES		
FEMALE	40(35.7%)	6(5.4%)	46(41.1%)	***0.754
MALE	56(50%)	10(8.9%)	66(58.9%)	
TOTAL	98(85.71%)	16(14.3%)	112(100%)	

Chi Square test was applied.

Table-3 Family history of atrial fibrillation of patients according to gender (n=112)				
FAMILY HISTORY (ATRIAL FIBRILLATION)	GENDER		TOTAL	P-value
	FEMALE	MALE		
NO	43(38.4%)	60(53.6%)	103(92%)	***0.623
YES	3(2.7%)	6(5.4%)	9(8.0%)	
TOTAL	46(41.1%)	66(58.9%)	100%	

Chi Square test was applied.

Table-4 Atrial fibrillation according to BMI of the patients (n=112)				
BMI	OUTCOME(ATRIAL FIBRILLATION)		TOTAL	P-value
	NO	YES		
25-33	55(49.10%)	9(8.03%)	64(57.13%)	***0.842
34-40	41(36.60%)	7(6.25%)	48(42.85%)	
TOTAL	96(85.71%)	16(14.3%)	112(100%)	

Chi Square test was applied.

DISCUSSION

Risk of stroke increases with presence of AF¹⁵ and its presence mostly indicates poorer outcomes¹⁶. The critical duration of AF that leads to formation of a thrombotic milieu in the heart and thereby causes embolic complications including ischemic stroke is unknown. Even though temporary or short living paroxysm of AF causes alteration in cellular metabolism of endocardial muscles leading to atrial stunting and atrial salvos on echocardiography, both of these have role in development of mural thrombi is not yet clear, however atrial contractile dysfunction associated with long lasting episodes of AF induces significant changes in cellular metabolism as well produce turbulence in blood flow ultimately leading to mural thrombus¹⁷. In our study the frequency of AF among patients with acute ischemic stroke was 14.3% and more in male gender compare with two other local studies from Peshawar showed 12% and 20.2% which is compatible with our study^{18,5}. A recent study from india by Goel D et al⁸ in contradiction to our study, showed the prevalence of atrial fibrillation among ischemic stroke patient was 25% and more in female. This discrepancy may be due to they use 24hour holter monitoring. Their study also showed that atrial fibrillation rate were more in elderly as

compared with our study in which atrial fibrillation were more in age group 35-55(8.03%) compared with 56-75(6.25%). In another study published in JAMA neurology in 2018 by Go AS et al¹⁹, in which 25268 patients were monitored with an extended continuous ambulatory electrocardiography for 14 days for paroxysmal AF and they found it in 1965 patients. The median burden of atrial fibrillation was 4.4% and higher burden was less likely in female. In our study we also try to find the effect of high BMI on atrial fibrillation but there was no association were seen between high BMI and Atrial fibrillation.

In ischemic stroke large areas of hypo perfusion and lower rate of recanalization associated with larger infarct volumes as well as hemorrhagic transformation are independent factors of poor outcome even more disabling when underlying cause is AF²⁰⁻²². It is not extensively studied that how does AF affects the response of recanalization therapies especially to thrombolysis and its outcome. Many clinical trials were carried out to measure the efficacy of recanalization therapies but no one was empowered specifically to explore an interaction between AF and treatment effect²³. One study was carried out in which patients who had AF as underlying cause of stroke were divide in two groups one group consisting of fifty three

patients received tpa while other group of fifty five received placebo.that showed increased mortality and poor recanalization in patients who have AF²⁴, this was named (ECASS) Three trial.

In the recently published IST3 study, the authors reported no differential benefit when comparing tPA versus control among patients with (24.1% versus 22.3%) or without (42.2% versus 40.4%) AF²⁵. In the VISTA Collaboration, among 3027 patients receiving thrombolysis, 1631 (53.9%) had a history of AF²⁶. The authors found a similar magnitude of benefit with tPA compared with placebo for patients with AF (OR, 1.44; 95% CI, 1.12–1.73) and without AF (OR, 1.53; 95% CI, 1.39–1.69). Some times AF may be silent i.e. unnoticed. In general population one recent screening study was carried out in individuals of 75 to 76 years of age by prolonged intermittent ECG monitoring that found 48% more subjects have AF than already known(that is increase of 14.3% from 9.6%)²⁷, this indicates that AF is highly prevalent in this age group. In ischemic stroke prevalence of AF is much higher than our expectations. Therefore much efforts were taken to early diagnose and treat AF initially CHADS2 score was widely used which included age \geq 75 years, congestive heart failure, diabetes mellitus, hypertension, (1 point for each) and stroke/TIA (2 points).keeping in mind the burden of symptomatic and silent AF associated with stroke more inclusive score system was designated to overcome/minimize the chance of misdiagnosis that is called as CHA2DS2-VASc consisting of 0-9 points.this scoring system also incorporated peripheral vascular disease, aortic plaque, myocardial infarction,which in turn more readily recognized the increased risk of stroke among women with AF that were probably escaping from previous scoring system. These efforts sufficiently ensured the effective early treatment of AF with anticoagulants and possibly have significant role in stroke risk reduction. still large scale prospective studies are needed to clarify or validate these approaches. One previous study done by Friberg et al²⁸ suggested that only sixteen percent patients who are hospitalized with stroke and AF had been treated with oral anticoagulants during months preceding the stroke and from another study of France during 2000 to 2006 this reported to be 22%²⁹.

Regarding a new diagnosis of \geq 30-s-long AF episodes on Holter monitoring is probably a reflection of the fact that various tools such as ECG or inpatient rhythm monitoring capture new AF episodes in many stroke patients and thereby lead to an inevitable drop in the yield of Holter monitoring among ischemic stroke patients in this regard. Finally, MRI data were available in most, but not all of our controls. However, there were no differences in the demographic and clinical characteristics of those cases with and without MRI.

In patients with AF, an ischemic stroke is not necessarily cardioembolic. For example,

hypertension and vascular disease are risk factors for development of AF just as they are risk factors for stroke. Clinically, this distinction is of minor importance, because all studies about stroke and stroke prophylaxis in AF have been done with real-world patients who often also have these other risk factors.

Ethics Approval: The ERC gave ethical review approval **Consent To Participate:** consent was taken from subjects and next of kin. **Funding:** NIL. **Acknowledgements:** We would like to thank the all contributors and staff and other persons for providing useful information. **Authors' Contributions:** All authors read and approved the final manuscript. **Conflict Of Interest:** No competing interest declared.

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