

Prevalence of atrial fibrillation among patients with ischemic stroke

Husain Tayib Fatah, Farman Jaafar Ahmed, Fahmi H. Kakamad

ABSTRACT

Aims: The incidence of atrial fibrillation (AF) is increasing because of the aging population and advance in the treatment of acute cardiac conditions. The aim of this study is to evaluate the prevalence of AF in patients presenting with ischemic stroke. **Methods:** A cross-sectional study in the medical emergency department and neurology unit of Shar hospital in Slemany city was carried out, for a period of five months, from 1 March 2015 to 1 August 2015, on a sample of 324 patients with ischemic stroke. The data was obtained from the patient's case sheet for their personal detail including age, smoking status, etc. and through direct questioning from patients or their relatives. **Results:** About 17.6% of patients with ischemic stroke found to have AF and, 87% of them previously known to have the disease. Five percent had received warfarin before the stroke onset, and only 21% of survivors anticoagulated within the first three months after discharging from the hospital. **Conclusion:** Prevalence of

atrial fibrillation among patients presenting with ischemic stroke is 17.6%.

Keywords: Atrial Fibrillation, Hypertension, Ischemic Stroke

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INTRODUCTION

Atrial fibrillation is the most common sustained cardiac rhythm disorder, affecting 1–2% of the general population [1]. Its incidence increases with age, from less than 0.5% at 40–50 years old population, to 10% in populations who are 80 years old [2].

Pathogenesis of thrombus formation in AF is a multifactorial process that includes stasis in a poorly contractile left atrium and the presence of a prothrombotic or hypercoagulable state, prothrombotic atrial anatomy, the morphology of the left atrium, long, narrow and hooked extension, creates an anatomic substrate for blood stasis [3].

Atrial fibrillation predisposes to alterations in collagen degradation products and impaired extracellular matrix degradation [4]. The main intravascular promoters of thrombogenesis are platelets and the various proteins of the coagulation cascade. Patients with AF-related stroke, has indicators of increased thrombin generation which

includes increased levels of prothrombin fragments 1 and 2, thrombin-antithrombin III complex, and von Willebrand factor (vWF) [5]. Also these biomarkers may be of importance in reclassifying patients with moderate risk of AF-related stroke, in whom measurement of high vWF levels, for example, may reclassify such patients as high risk [6]. The aim of this study is to evaluate the prevalence of atrial fibrillation in patients presenting with ischemic stroke.

MATERIALS AND METHODS

Study design and settings

A cross-sectional, multicenter study was carried out for a period of five months, from 01 March 2015 to 01 August 2015. The first three months were in spring, the remaining two months were in summer.

Population of the study

All admitted patients with ischemic stroke during the study period were included in this study regardless to age group. Exclusion criteria: hemorrhagic stroke, patient with stroke mimics (primary and secondary cerebral tumor, subdural hematoma, cerebral abscess, peripheral nerve lesions, demyelination), patients with functional stroke (Todd's paralysis, hypoglycemia, migrainous aura with or without a headache, encephalitis, Meniere's disease, focal seizure), valvular heart disease, paroxysmal AF.

Data collection

The data was obtained from the patient's case sheet for their personal detail including date of birth, weight, smoking status etc. Through direct questioning from patients or their relatives, and fulfilling a prepared questionnaire. The patients were diagnosed and labeled as ischemic stroke by their neurologist after doing CT scan of the brain. Those who had first AF on admission also asked to come back and have another electrocardiography (ECG) after three months, and drugs (including anticoagulation) are reviewed at that time.

Statistical analysis

Data analysis was done by computerized statistical software; Statistical Package for Social Sciences (SPSS) version 22. Descriptive statistics were presented as (mean±standard deviation) and frequencies as percentages. In all statistical analysis, the level of significance (p-value) was set at ≤ 0.05 .

Ethical considerations

- Approval was taken from Kurdistan Board of Medical Specialty and Slemany Directorate of Health.

- Oral consent was taken from each patient and they were assured of the confidentiality for the information.

RESULTS

The sample included 324 patients with mean age 67 ± 7 years, ranging from 50–89 years. Regarding gender, 186 patients (57.4%) were males. Table 1 gives patient's distribution according to socio-demographic characteristics and past medical history with regard to AF. In our sample, 57 patients had AF (17.6%). There was no statistical difference between patients with AF and those without AF in relation to age, smoking, diabetic mellitus, hypertension and ischemic heart disease ($p > 0.05$). However, there was statistically significant difference in relation to gender, chronic heart failure, history previous stroke, onset of stroke development and alertness in conciseness level ($p < 0.05$).

DISCUSSION

Cardio-embolic stroke accounts for approximately 25% of all ischemic strokes and is a very important emergency in neurology. Cardio-embolic strokes are associated with high morbidity and mortality because they are often large or are involved multiple cerebral vascular territories. Also, the risk of early hemorrhagic transformation is high [7].

The prevalence of AF among patients with ischemic stroke in our study was 17.6%. This result took a median place among Norberto et al. 2004, Kanonidis et al. 2010 and Hannon et al. 2010, showing the prevalence of AF in patients with ischemic stroke of 15.7%, 16% and 21% respectively [7].

Patients with AF and stroke were generally older than patients with stroke but without AF (p-value = 0.001). The reason for this is that the prevalence of AF increases successively with age. As also seen in Wilke et al. 2013 [8]. But generally their AF and non-AF group were older than our study groups, this was also verified by Gulf Survey of Atrial Fibrillation Events, which found that Middle East patients are a decade younger than patients in Western registries of AF [9].

Although overall patients in this study were male predominant (57.4% versus 42.6%), AF occurred more frequently in females than males (56.1% and 43.9%, respectively) Odd Ratio: 1.4, 95% CI of 1.8–1.09) and a p-value of 0.023. Similar ratio was found in Arboix et al. 2000 [10]. Mean age of female was 72.6 while of male was 67.3 (*t*-test 2.9 mean difference 5.2 years, 95% CI: 1.3–8.7, p-value 0.04), this is consistent with what is found in Wiszniewska et al. 2011 [11].

Hypertension is a known risk factor for the development of AF [12]. Thereby, the proportion of

Table 1: Distribution of demographic characteristics and past medical history according to atrial fibrillation.

	Atrial Fibrillation		No Atrial Fibrillation		χ^2	p-value
	No. Atrial Fibrillation		Fibrillation			
	P					
	No.	%	No.	%		
Age : 50–64 years	9	9.9	82	90.1	5.2	0.07
Age : 65–74 years	28	21.1	105	78.9		
Age : \geq 75 years	20	20	80	80		
		1				
Male	25	43.9	161	60	5.2	0.02
Female	32	56.1	106	39		
Smoking	15/57	26	60/267	22	0.3	0.5
Hypertension	40/57	70	155/267	58	2.9	0.09
Diabetes mellitus	23/57	40	80/267	30	2.3	0.12
Congestive heart failure	33/57	57	27/267	10	71	0.001
Ischemic heart disease	8/57	14	33/267	12	0.1	0.7
Peripheral artery disease	9/57	15	36/267	13	0.2	0.6
Previous stroke	15/57	26	27/267	10	10	0.01
Sudden onset of neurological deficit	47/57	82	174/267	65	6.4	0.01
Altered consciousness	51/57	89	41/267	15	12	0.001

patients with known hypertension in our AF group to be higher than those without AF (70% versus 58%) which was nearly the same finding in Friberg et al. 2014 [13]. However, hypertension was more prevalent about 78.6% in Henriksson et al. 2010 [14].

Hypertension is also a well-established independent risk factor for ischemic stroke as well [15]. However, hypertension still stands as a predominant risk factor in non-AF group as well, we could not have a statistically significant difference for hypertension between these two groups (p-value = 0.09).

Patients with diabetes mellitus have a significantly increased risk of stroke compared with non-diabetics, especially younger patients [16]. Still, we could not show any difference in the proportion of diabetes mellitus patients in the AF group 40.4% compared with the larger group without AF 30% with a p-value of 0.12.

Sudden onset of the maximal neurological deficit on presentation is characteristic of cardio-embolic stroke as embolic occlusion is rapid and may not allow time for collaterals to become available [17]. In our study, we found that 82.0% of patients in AF group were having sudden onset of the maximal neurological deficit which is similar to what is found in literature [9].

Altered consciousness which we found in 89.5% of our AF group, in contrast, non-AF was 15% with a p-value of 0.001. Although it is a clinical factor traditionally associated with cardio-embolic infarction but it was not a significant predictor. Sherman et al. found that patients

with the greatest risk of embolism were those with either hypertension or AF [17].

Data on international normalized ratio (INR) on admission are not present in this study. Only three patients were on warfarin and two of them were taking low dose (0.5 milligram warfarin a day), beside that only 21% of survived patients were anticoagulated in the first three months after the attack. While 32.6% of patients were anticoagulated prior to ischemic stroke in Tanaka et al. 2015, 53% of patients discharged on warfarin in Norberto et al. 2004 [18]. In Friberg et al. study, 35.0% of the survivors received warfarin within the first three months after discharge [13].

CONCLUSION

Prevalence of atrial fibrillation (AF) among patients with ischemic stroke is 17.6%. Atrial fibrillation presenting with stroke is more prevalent among females. The significant risk factors among ischemic stroke patients with AF were congestive heart failure, age, history of previous stroke, altered consciousness and sudden onset of maximum neurological deficit.

Author Contributions

Husain Tayib Fatah – Substantial contributions to conception and design, Acquisition of data, Analysis

and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Farman Jaafar Ahmed – Substantial contribution to the concept and design, Acquisition the data, Drafting the manuscript, Revising the manuscript, Final approval of the version to be published

Fahmi H. Kakamad – Substantial contribution to the concept and design, Acquisition the data, Drafting the manuscript revising the manuscript, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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