ATRIAL FIBRILLATION AND ISCHEMIC STROKE: A HOSPITAL BASED STUDY ON ELDERLY PATIENTS IN KARACHI, PAKISTAN

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ABSTRACT

Objectives: *To study atrial fibrillation as risk factor in elderly patients for ischemic stroke.*

Methodology: *This cross section, hospital based, comparative study of different age groups was conducted at Department of Medicine, Unit 1, Jinnah Post Graduate Medical Centre, Karachi, Pakistan, January 2007 to June 2010 on 458 (271 male and 187 female) patients with ischemic stroke. Patients above the age of 50 years with ischemic stroke were categorized into four age groups. Other risk factors for stroke were also taken into consideration. Data were analyzed to determine age based relationship with atrial fibrillation.*

Results: *Atrial fibrillation was observed in 190/458 patients (41.48%) above the age of 50 years who reported with ischemic stroke Out of which 112 (58.95%) were male and 78 (41.05%) were female. Atrial fibrillation was observed to be 11.20% in age group 50-59 years which increases to 39.85 % in the age group 60-69 years and 67.92% in the age group 70-79 years. It slightly drops to (61.11%) in the patients with more than 80 years age. No significant difference in these percentages was seen on the basis of gender. Observed through their medical record, other risk factors such as hypertension, previous structural heart diseases, previous stroke and smoking were also having similar impact, frequency of stroke in the elderly.*

Conclusion: *The study reveals that atrial fibrillation is a major risk factor for stroke in elderly patients.*

Key words: *Atrial Fibrillation, Stroke, Risk factors, Age-dependence, Hypertension, Smoking, Heart disease.*

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INTRODUCTION

Atrial fibrillation (AF) is the most common type of cardiac arrhythmia which is characterized by uncoordinated atria with deterioration of mechanical function of the heart. It is, thus, the electromotor dysfunction of heart which leads to compromised blood supply to different organs.[1-3] There is also embolism to different parts of the body especially brain. There are three types of atrial fibrillation i.e. paroxysmal (a spasmodic type which starts with abnormal electrical signals resulting in quickened heart rate but lasts only for short period and then stops on its own), persistent (stops with treatment) and longstanding persistent (cannot be restored with normal treatment). Diagnosis of AF is usually done with a surface ECG which shows the absence of P waves and a chaotic and irregular baseline.[4,5] Typically, AF is believed to result from the simultaneous existence of multiple migratory reentrant wave fronts of activation in both atria. Medical treatment is important with regard to rate control, prevention of thromboembolism and rhythm control.[6] Prevention of thromboembolism is achieved mainly through chronic use of warfarin.[7] In patients with atrial fibrillation rhythm control is only needed when patient is symptomatic despite optimum ventricular rate and this can be achieved pharmacologically or non-pharmacological ways such as catheter ablation or surgical blockage.[8] There is a need to diagnose and treat atrial fibrillation before occurrence of stroke especially in patients above 50 years of age as a primary preventive measure which will be beneficial especially if anti-coagulants are used.

Stroke is common at any age but more common especially in older age.[9] Atrial fibrillation is considered to be a major risk factor for ischemic stroke, especially in elderly patients.[2,3,10-12] However, only a few studies are made on its influence on outcome of stroke.[1] In Peshawar, Pakistan, atrial fibrillation was noticed in 22% and 25% patients suffering from stroke[13,14] whereas from Lahore, Pakistan 10% and 7% cases among such patients was reported.[15,16] In another study, atrial fibrillation was observed in 3.31% patients in Peshawar.[17,18] Prevalence of atrial fibrillation was observed 1% in the general population, 6% in people older than 65 years of age, and increases

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up to 9% at the age of 80 to 89 years.[19,20] A similar study based on relevance of age on atrial fibrillation was lacking in Pakistan. Keeping this in view, the present study based on 458 patients treated at_Jinnah Postgraduate Medical Centre (JPMC) in Karachi, Pakistan was initiated

METHODOLOGY

Data of patients reported for suspected cases of atrial fibrillation was recorded at Jinnah Post Graduate medical Centre, one of the largest medical centres in Pakistan. Major symptom of atrial fibrillation in these patients was observed to be is increase in pulse rate (usually over 140 beats per minute). In addition, dizziness, lightheadedness, confusion, palpitations, breathlessness, weakness, chest pains during physical exertion, angina, hypotension, heart failure and disorders of the heart muscle or a combination of all of these are also associated with atrial fibrillation. Data of patients above age of 50 years with ischemic infarction documented on CT scan brain with neurological deficit was recorded. These patients had multiple major (such as hypertension, diabetes mellitus, past history of stroke etc.) or moderate (such as male gender and smoking etc.) risk factors. However, all patients with previous history of atrial fibrillation and patients below age of 50 years were excluded because of the treatment they may be taking for atrial fibrillation. All the patients above the age of 80 were grouped in one category. Similarly patients with intracranial bleeding, hematoma or subarachnoid hemorrhage were also excluded. Atrial fibrillation as a factor for incidence stroke was studied without being influenced by the self-fulfilling criteria for stroke type. Atrial fibrillation and changing effects of risk factors on the incidence of stroke with advancing age with each condition was estimated through descriptive retrospective study using a class interval of 10-year age groups. In addition to atrial fibrillation,_other risk factors like hypertension, diabetes, previous stroke, smoking and structural hear disease are also taken into consideration. The patients were treated with oral anticoagulants (warfarin) but no long term follow up was done. Data was recorded and presented in form percentage of incidences both graphically and in tabular form.

RESULTS

In the study period, a total of 458 patients with ischemic infarction established by brain CT scan were observed at Medical Unit 1, Ward 5, JPMC. Out of these, 271 (59.2%) were male and 187 (40.8%) were female. Atrial fibrillation was observed in 190 patients (41.48%). Out of which 112 (58.95%) were male and 78 (41.05%) were female. These results show that about 41% of the patients were above the age of 50 years who reported with ischemic infarction were found to have atrial fibrillation (Fig. 1). Percentage with atrial fibrillation was observed to be 11.20% in age group 50-59 years which increases to 39.85 % in the age group 60-69 years to 67.92% in the age group 70-79. It slightly drops to (61.11%) in the patients with more than 80 years age (Fig. 1). No significant

TABLE-1. DATA OF STROKE REPORTED FROM JINNAH POST GRADUATE MEDICAL CENTRE, KARACHI

Age	50-59	60-69	70-79	>80	Total
Total Number of Patients					
Male	88	74	97	12	271
Female	55	64	62	6	187
Total	143	138	159	18	458
Atrial Fibrillation					
Male	10	30	65	7	112
Female	6	25	43	4	78
Total	16	55	108	11	190
Hypertension					
Male	33	73	80	4	190
Female	23	41	67	1	132
Total	56	114	147	5	322
Previous Structural Heart Disease					
Male	44	19	87	1	
Female	23	12	4	0	
Total	67	31	91	1	
Previous Stroke					
Male	9	9	18	0	36
Female	3	2	12	0	17
Total	12	11	30	0	53
Smoking					
Male	15	66	42	3	126
Female	4	2	1	0	7
Total	19	68	43	3	133

Table II

difference in these percentages was seen on the basis of gender.

The study also revealed that hypertension is dominant risk factor in patients with stroke seen in almost in 79% patients (Table-I). In males, 85.97% patient were suffering from hypertension, whereas in female the percentage was much lower (70.59%). It was also observed that almost all patients in the age group 60-69 years were observed to have hypertension. This group was also observed to be heavy smokers (89.19%). The data also indicates that patients who previously had myocardial infarction were more prone to stroke (46.51%). However in age group 70-79 years, 89.69% patients were observed to have prior history of myocardial infraction.

DISCUSSION

It has been documented that atrial fibrillation and its association with cerebral ischemic stroke is not an

PERCENTAGE OF PATIENTS WITH ATRIAL FIBRILLATION NOTICED IN JPMC, PAKISTAN

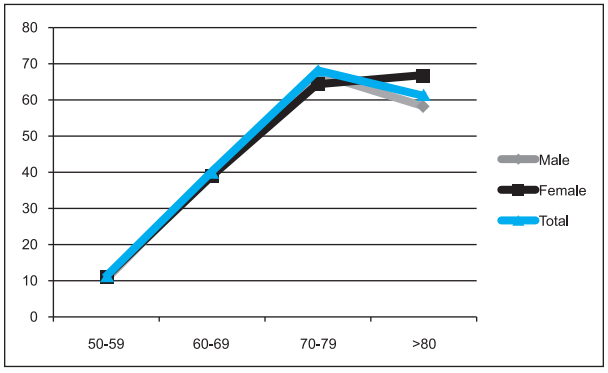

Figure 1

incidental finding rather it is a major risk factor especially in the elderly.[21,22] Analysis of the data reveals that with increasing age the number of reported patients suffering with stroke who also have atrial fibrillation increases. The findings clearly show that with increasing age, the incidence of cerebral ischemic stroke with atrial fibrillation is significantly increased. Other risk factors including hypertension, previous heart disease, smoking and previous stroke were also observed to be important contributor to cerebral ischemic stroke. The findings observed are in line with observations made by others.[20] Percentage of atrial fibrillation was observed during this study to be comparatively high (42.57%) compared to studies made in Peshawar, Pakistan where this percentage was noticed to be only 3.31%[18] which can be attributed to higher age group studied during present study. In patients younger than 45 years, there is a lower major complication rate and a comparable efficacy rate, with a greater chance of being atrial fibrillation free without antiarrhythmic drugs. [9,23] Based on this fact we have not taken into account patients of less than 50 year of age during our study. It was also observed that the incidence rate (per 1000 person-years) of first-ever stroke was 72.3, 52.2, and 52.2 in persons with atrial fibrillation and 63.8, 54.6 and 30.6 in those without it respectively.[12] Since in the present study follow-up of the patients was not done, therefore, such incidence rate was not recorded. The influence of atrial fibrillation on health increases with age.[24] They reported that atrial fibrillation independently increases stroke risk 5-fold and overall stroke risk increases with age. The data clearly indicates that with increasing age in patients suffering from stroke, incidence of atrial fibrillation also increases. Slight decrease in percentage of patients of more than 80 years of age may be attributed to limited number of patients in this age group.

It was observed that with increasing age the effects of hypertension, coronary heart disease, and cardiac failure on the risk of stroke became progressively increased as advancing age may not reduce the significant impact of atrial fibrillation.[10] In the same studies, it was also observed that the elderly are particularly vulnerable to stroke when atrial fibrillation is present. Impact of hypertension, coronary heart disease, and cardiac failure was observed to be equally pronounced with increasing age,[10] however, in present study the impact of these factors was observed to be significant.

It was concluded that the number of patients with atrial fibrillation is likely to increase 2.5-folds during the next 50 years, reflecting the growing proportion of elderly individuals,[21] therefore, there is a need to undertake a coordinated efforts to tackle the challenge of optimal stroke prevention and rhythm management in patients with atrial fibrillation. It was also observed that the stroke rate associated with atrial fibrillation has declined over the last 10 years.[25] However it was noted that the emerging atrial fibrillation epidemic threatens to increase the incidence of cardioembolic stroke

It was also observed during the present study, atrial fibrillation without underlying cardiac disease or known cause were associated with formation of larger size of clot in the heart and stroke associated with it which is generally severe and associated with greater mortality and morbidity as also observed in the study by Syed NA et al.[3] The clot formed by structural heart diseases and other known cause are smaller in size and subsequently led to mild stroke.

In patients with atrial fibrillation stroke risk increases with age,[24] therefore, the absolute benefit of oral anticoagulants increases as patients get older. However, in our study such benefits/risks in relation to age were not assessed.

This study carried out in a tertiary medical center in Karachi reveals that atrial fibrillation is a major risk factor in patients suffering from stroke. Despite no follow up study was carried out, it is evident that the incidences of strokes increase with atrial fibrillation above the age of 50. Atrial fibrillation is a major condition increasing in elderly with age in patient between age 50 and >80 years reported for stroke at JPMC Karachi.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

MRKD: contributed to conception & study design; acquisition, analysis, interpretation of data and drafting the manuscript

CONFLICT OF INTEREST

Authors declare no conflict of interest

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NONE DECLARED

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