Research Paper

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Clinical Profile of Atrial Fibrillation with Reference to 2-D ECHO Study

Medical Science

KEYWORDS : Atrial Fibrillation, Rheumatic Valvular Heart Disease, Mitral Stenosis, Mitral,Regurgitation, Aortic Regurgitation Aortic Stenosis

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ABSTRACT

AF is the common permanent arrhythmia and is characterized by rapid, irregular atrial impulses, ineffective atrial contractions and by irregular rapid ventricular beats. RVHD is the commonest responsible for AF. Study was aimed to correlate clinical & 2D-ECHO features in patients with Atrial Fibrillation. Total 103 patients of ≥ 13 years of age with ECG s/o AF were selected for the study .It was observed that AF occurred more in 31-50 years of age(57.29%), more in females (56.31%) than males(43.69).The major symptoms of AF were breathlessness(85.44%) & palpitation(67.96%).64.08% patients had apex pulse deficit of 10-20 beats/minute . ECG wise coarse f waves were observed in 69.90% while fine f waves in 30.10% . Permanent AF was seen in 86.4% & was most common type in RVHD. RVHD(68.93%) was the commonest cause of AF . CCF was seen in 55.34% patients . Mitral valve affected in all cases of RVHD with AF. Isolated MS & MS+MR were common structural lesions (43.68%). Non-valvular AF was seen in 32.31% cases.2DEcho helped in detecting etiology, left atrial size, presence of thrombus .Age<50 (p<0.018) , breathlesness (p<0.005) ,palpitation (p<0.03) , LA size of >3.5 cm (p<0.001) & CNS embiolisation (p <0.0027) were found to be statistically significant for valvular AF.

Introduction:- Atrial fibrillation is the most common permanent arrhythmia and is characterized by rapid, irregular atrial impulses, ineffective atrial contractions and by irregular rapid ventricular beats. It may occur in paroxysmal, persistent or as permanent arrhythmia. Total incidence in community is approximately 6%.. Paroxysmal type may be seen in normal individuals after emotional stress, during alcoholic intoxication ,following surgery , acute hypoxia & Thyrotoxicosis. RVHD is the commonest condition responsible for AF (permanent) , however other conditions like IHD, Hypertensive heart disease, Pericardial heart disease, ASD, Chr. Lung disease can give rise to AF.

Study Objectives:-To study & correlate clinical features & 2D-echo features in patients with Atrial Fibrillation .

Inclusion Criterias:- Patients willing to give consent ,attending cardiology OPD , routine OPD & admitted in the wards in tertiary care hospital with age ≥13 years and & having ECG evidence of Atrial Fibrillation were selected for the study

Material & Methods:- 103 patients were included in our study . The study protocol was approved by Ethics committee. Detail clinical evaluation was done. ECG was done in all cases.Tests like RFT, SE, BSL were done in every case. 2 D ECHO study was performed in all the cases to find out etiology of AF.Investigation like Blood culture, ASO titers, Fundus examination, Thyroid function tests, Lipid profile were done in selected (indicated) patients. CT scan (brain) and peripheral Arterial Doppler was performed in cases who had evidence of embolism.

Statistical analysis was performed with Chi-Square test. & Fischer exact test .

Results & Discussion:-

As Shown In Table 1, The age of the patients ranged from 13 to 90 years with mean age of 46.07 years. 29.13% patients were in the age group 41-50 yrs & 28.16% patients were between 31-40 years . AF was maximally observed in between 31-50 years ie 57.29%(n=59).In 1972Rama Shetty et al 1 from India in his study on RHD also reported AF occurrence at an earlier age. According to Framingham heart study2 as age advances risk of developing AF also increase. 56.31% patients were females (n=58) & 43.69% patients were males (n=45). Male to female ratio was 1:28 The high incidence of AF in females in our study could be due to RVHD being the most common etiology in females . According to Fuster et al3 prevalence of AF in Western is more in males than females . Breathlessness was the most common symptom in 88 (85.44%), followed by palpitation in 70 (67.96%).Other symptoms were chest pain in 26.21%(n=27) , pedal edema in 31.07% The high incidence of breathlessness in our study possibly explains contributory role of AF in deteriorating cardiac functional status in these patients symptoms of embolic phenomenon such as focal neurological deficit or limb pain was observed in 11(10.68%) Apex pulse deficit varied from 10-40 beats/min,66(64.08%). of our patients had pulse deficit of 10-20 beats/min Absent p wave & irregular rhythm was present in all the 103 patients. Majority of the patients had coarse f waves 69.90%(n=72) while fine f waves were present in 30.10% (n=31) . Normal axis was observed in 68.93%(n=71) RVH was noted in 19.42 % (n=20). Ischaemic changes were in 9 cases(8.74%). Permanent AF was observed in 89(86.4%). Amongst patients with permanent AF , rheumatic heart disease was observed in 66.99%, nonrheumatic lesions in 20 (33%). All patients who had LA thrombus (n=11), had permanent AF .

As Shown In Table 2,commonest cause of AF was Valvular heart disease in 68.93% (n=71) while nonvalvular lesions were in 32.31% cases . IHD was seen in 6.80% (n=7), hypertension in 3.88% (n=4) ,cardiomyopathy in 2.91 (n=3), thyrotoxicosis,2.91%(n=3),COPD 1.94% (n=2). 2(1.94%) patients had CHD , 8(7.77%) patients had multietiological factor while lone AF was seen in 2 cases(1.94%).As compared to our study in Framingham4 study RVHD was present in 10.2 %, IHDin 16.3%, HT in 10.2%. The difference between two studies is due to the fact that RVHD is common in India & is the commonest cause of AF. Accordingto Eric N Pristowsky5 hypertensive heart disease is the most common in Western countries followed by coronary artery disease while in developing countries6 still rheumatic valvular heart disease is a major cause .Rheumatic fever is a social disease linked to poverty , overcrowding, poor housing conditions & inadequate health services . It declines sharply when standard of living is improved6 Among the valvular lesions isolated MS was present in 27.18%(n=28) , MS+ MR was seen in 16.5%(n=17), while double valvular ie MV +Aortic valve lesions in 13.59%(n=14) & mitral + tricuspid valve disease in 9.76% (n=10) , while triple valve disease was observed in only in 1.9%(n=2). In a study in India7 , more than half of 8000 patients with RVHD had MS .Population studies7 indicate the prevalence of rheumatic heart disease is 2 per 1000 population7 . Results of our study are comparable to this Indian study. Mitral valve was involved in all cases of RVHD either isolated MS in 28(27.18%) or combined MS+MR in 17 (16.50%) or multivalvular lesion in 26 (24.73%). A study from India by Sinan Aydogdu et al8 showed that in RVHD, AF occurs in highest frequency in isolated MS (29%),isolated MR(16%) & is infrequent finding in aortic valve disease(1%)8. Mitral valve area ranged from

0.7 to 4.5 cm2 with maximum number of patients (n=63) with area<1.2. In patients with isolated mitral stenosis (n=28), mitral valve area was between 0.8-3.1(mean 1.27 cm2), while in patients with combined MS+MR (N=17) mitral valve area was between 1.4-2.5cm2 (mean 2.22 cm2).The LA size in our study varied between 2.3 to 5.4 cms. Average LA size was 3.95 cm. LA size more than 4 cm was present in 59(57.28%) while left atrial size of less than 4 cm was observed in 44 (42.72%).According to Framingham study2 & Cardiovascular health study M-mode detection of increase9 in LA size is a predictor of incident AF .Average left atrial size in patients who developed LA thrombus & LA smoke was 4.20 cm & average mitral valve area was 1.45 cm2 . Vegetations of IE on ECHO were observed in 3.88%(n=4)

As Shown In Table 3, Permanent atrial fibrillation was seen in 86.4%(n=89) ,persistent AF in 08.73%(n=9) while paroxysmal AF was seen in 4.8% (n=05) patients . In patients with RVHD , 66.99 %(N=69) had permanent , 1.94%(n=2) had persistent AF while in patients with IHD 1.94%(N=2)each had permanent& persistent AF & 2.91%(N=3) had paroxysmal AF . CCF was present in 57 patients (55.34%),

As Shown In Table 4 ,in patients with age less than 50 years valvular lesions were found in 56(75.67%) & nonvalvular lesions in 18(24.32%) while in pts with age more than 51 years(n=29), valvular lesions were found in 15(51.72%) & nonvalvular in 14(48.28%). Age less than 50 years is statistically significant for valvular lesions (p<0.018). Breathlessness was observed in 62 (60.19%) patients with valvular lesions , palpitation in 52 (50.48%) . Breathlessness (p<0.005) & palpitation (p<0.03) are the only symptoms statistically significant against valvular & nonvalvular lesions . Type of AF was not found to be statistically significant for either valvular or nonvalvular lesions.71(68.93) patients with valvular lesions had AF while 32(31.07) patients with nonvalvular lesions had AF & is not significant statistically either for permanent or persistent or paroxysmal AF .In our study left atrial size of > 3.5 cm was seen in 90.14%(n=64) patients with valvular lesion & 15.60%(n=05) patients with nonvalvular lesion while left atrial size of <3.5 c m was seen in 12.7%(n=07) patients with valvular & 84.4%(n=27) patients with nonvalvular lesions. Left atrial size of >3.5 cm was found to be statistically significant for valvular lesions (p<0.001). left atrial thrombus in our study was found in 11.65%(n=12) & left atrial smoke in 6.80(n=7).Left atrial thrombus & smoke was observed only in valvular lesions (n=18). CNS emboliosation was seen in 72.72% (n=8) patients with valvular lesion while 9%(n=1) patients with nonvalvular lesion while peripheral embolisation was seen in 9%(n=1) patients with valvular & nonvalvular lesions 9%(n=1). CNS embolisation statistically is significant for valvular lesions(p<0.0027).

Conclusions:-- AF occurred more in patients between 31-50 years of age. AF occurred more in females than males. The major symptoms of AF at presentation were breathlessness & palpitation. RVHD was the commonest cause followed by IHD. Mitral valve got affected in all cases of RVHD with AF. Isolated MS & combined mitral valve lesions (MS+MR) were common structural lesions. Permanent AF was the most common type of AF in RVHD. Echocardiography helped in detecting etiology of AF,also detects left atrial size, presence or absence of thrombus in patients with AF.CNS was the most common site of embolisation .

Table 1: – Age ,Gender,Clinical Features & Apex Pulse Deficit ,ECG Findings In Study Population

n=(%)		
Age (Years) Mean age – 46.07 years	< 20 21- 30 31- 40 41 - 50 51 - 60 > 60 Total	03(02.91) 12(11.65) 29(28.16) 30(29.13) 15(14.56) 14(13,59) 103(100)
Gender	Males Females	45(43.69) 58(56.31)
Clinical Features	Breathlessness Palpitation Cough With Expectoration Swelling Of Lower Limbs Chest pain Distension Of Abdomen Loss Of Consciousness Vomitting Fever	88(85.44) 70(67.96) 35(33.98) 32(31.07) 27(26.21) 11(10.68) 03(02.91) 03(02.91) 06(05.83)
Apex-Pulse Deficit	0-10 11-20 21-30 31-40 41-50	04(03.88) 66(64.08) 23(22.33) 08 (07.77) 02(01.94)
ECG Findings	Absent P Wave Irregularly Irregular Rhythm Fine Fibrillatory Waves Coarse Fibrillatory Waves Normal Axis RAD LAD RVH LVH Ischaemic Changes	103(110) 103(100) 31(30.10) 72(69.90) 71(68.93) 21(20.39) 19(18.45) 20(19.42) 05(04.85) 09(08.74)
Type Of AF	Permanent Persistent Paroxysmal	89(86.4) 09(08.73) 05(04.8)

Table 2 :- Echocardiographic Diagnosis , Mitral Valve Area &Left Atrial Size

Valvular heart disease (n=71,68.93%)	Isolated Mitral Valve Lesions (N=45, 43.68%)	Isolated MS MS+MR	28(27.18) 17(16.50)
	Combined Mitral+Aortic Valve Lesions(N=14,13.59%)	MS+AR MS+MR+AR MS+MR+AS+AR MS+AS	06(05.80) 05(04.85) 02(01.94) 01(0.90)
	Combined Mitral +Tricuspid Valve Lesions(N=10, 09.7%)	MS+MR+TR MS+TS+TR MS+TR	04(03.88) 04(03.88) 02(01.94)
	Combined Mitral+Tricuspid+Aortic Valve Lesions (N=02, 1.94 %)	MS+AR+TR	02(01.94)
Nonvalvular heart disease (n=32, 31.06%)		IHD HT Cardiomyopathy Thyrotoxicosis COPD CHD Lone AF Alcohol >1 Etiology	07(06.80) 04(03.88) 03(02.91) 03(02.91) 02(01.94) 02(01.94) 02(01.94) 01(00.97) 08(07.77)
Mitral Valve Area(cm)^2 (Range -0.7 to 4.5 cm^2)		<1 1.1-2 2.1-3 3.1-4 4.1-5	31(30.10) 32(33.01) 07(06.80) 19(18.45) 12(11.65)
Left Atrial Size (cms) -- Average 3.95 cm		<3 3.0- 4 4.1-5 5.1-6	20(19.42) 24(23.30) 44(42.72) 15(14.56)

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Table 3 :-- Atrial Fibrillation – Types,Etiology ,Complications

Type Of AF		Permanent 89(86.4 %)	Persistent 09(08.73 %)	Paroxysmal 05(04.8%)	Total 103(100%)
Etiology Of AF		Permanent	Persistent	Paroxysmal	Total
	RVHD	69(66.99)	02(01.94)	00(0.00)	71(68.93)
	IHD	02(01.94)	02(01.94)	03(2.91)	07(06.80)
	Cardiomyopathy	03(2.91)	00(0.00)	00(0.00)	03(02.91)
	HT	02(01.94)	02(01.94)	00(0.00)	04(03.88)
	COPD	01(0.97)	00(0.00)	01(0.97)	02(01.94)
	Thyrotoxicosis	01(0.97)	02(01.94)	00(0.00)	03(02.91)
	Alcohol	00(0.00)	00(0.00)	01(0.97)	01(0.97)
	CHD	02(01.94)	00(0.00)	00(0.97)	02(01.94)
	Lone AF	01(0.97)	01(0.97)	00(0.00)	02(01.94)
	>1 etiology	08(07.76)	00(0.00)	00(0.00)	08(07.77)
Complications Of AF				CCF Embolism IE Death	57(55.34) 09(08.74) 04(03.88) 00(0.00)

Table 4 :-- Correlation Of Age, Symptoms , Type Of AF,Left Atrial Size & Sites Of Embolism Among Valvular & Nonvalvular Lesions

Parameter			Valvular	Nonvalvular	Total	P Value
Age (years)		< 50 >50 Total	56(78.87) 15(21.13) 71(68.93)	18(56.3) 44(43.8) 32(31.06)	74(71.84) 29(28.15) 103(100)	<0.018
Symptoms	Breathlessness Palpitation Swelling Of Legs Chest Pain Embolisation	62(60.19) 52(50.48) 23(22.33) 19(18.44) 08(07.76)	26(25.14) 18(17.47) 09(08.73) 08(07.76) 03(02.91)	88(85.44) 70(67.96) 32(31.07) 27(26.21) 11(10.68)	0.005 0.03 0.70 0.90 0.27	
Type Of AF	Paroxysmal Persistent Permanent Total	00(0.00) 00(0.00) 71(71.00) 71(68.93)	07(21.87) 05(15.62) 20(62.50) 32(31.07)	07(06.80) 05(04.86) 91(88.34) 103(100)	NS	
Left Atrial Size(cms)	>3.5 <3.5 Total	64(90.14) 07(12.7) 71(68.93)	05(15.62) 27(84.4) 32(21.06)	69(66.99) 34(33.00) 103(100)	<0.001	
Sites Of Embolism	CNS Peripheral Total	08(72.72) 01(09.00) 09(81.81)	01(09.09) 01(09.09) 02(18.18)	09 (81.81) 02(18.18) 11(100)	0.0027	
Left atrial thrombus/ smoke	Thrombus Smoke	12(11.65) 07(06.80)	00 00	12 07	NA	

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