ORIGINAL ARTICLE

THE STUDY OF PREVALENCE AND CLINICAL PROFILE OF VALVULAR HEART DISEASES IN A TEACHING HOSPITAL

D. Radha Krishnan[1], V. Srinivas[2]

HOW TO CITE THIS ARTICLE:
D. Radha Krishnan, V. Srinivas. "The Study of Prevalence and Clinical Profile of Valvular Heart Diseases in a Teaching Hospital Andhra Pradesh". Journal of Evidence based Medicine and Healthcare; Volume 2, Issue 18, May 04, 2015; Page: 2707-2718.

ABSTRACT: Valvular heart disease is still a common causes of mortality and morbidity in India and rheumatic heart disease is still far more frequent. **AIMS AND OBJECTIVES:** To study the prevalence and clinical profile of rheumatic and non-rheumatic valvular heart disease in patients attending to Government General Hospital, Kakinada. **MATERIALS AND METHODS:** 100 Adult patients with valvular abnormalities attending to the Medicine and Cardiology Units of Government General Hospital, Kakinada from Nov 2011 - May 2013 were studied. Clinical history including various symptoms, past history of rheumatic fever, followed by systemic examination was done. A detailed cardiovascular examination with relevant investigations and evaluation was done. **OBSERVATIONS AND RESULTS:** The most common cause of acquired valvular heart disease is Rheumatic Heart Disease. Mitral valve involvement is the most common valve involvement with Mitral regurgitation as the most common valvular lesion. Mitral stenosis is the most common valvular lesion among rheumatic valvular heart disease. The most common complaint is breathlessness and the most common complication is Congestive heart failure. Multi valvular lesion is the most common valve involvement in patients presenting with congestive heart failure and infective endocarditis. Patients having atrial fibrillation are noted to have mitral stenosis more commonly. Mitral stenosis is the valve abnormality commonly noted in patients presenting with haemoptysis, respiratory tract infection and chorea. Left sided hemiplegia is common in patients with acquired valvular heart disease. **CONCLUSIONS:** Though the incidencen of rheumatic valvular disease is decreased in modern era, still continuing in our country. The analysis of the present study gives us insight into the various types of presentation of acquired valvular heart disease and to increase awareness besides early detection of valvular diseases clinically. It also helps in planning of early treatment of valvular heart diseases. This study also helps in proper plan of treatment thus decreasing mortality and morbidity of acquired valvular disease.

KEYWORDS: Acquired valvular heart disease, rheumatic heart disease. Multi valvular lesion.

INTRODUCTION: Corvisart in 1808 was the first to recognise the mitral regurgitation, which became prominent in19th century but still a common causes of mortality and morbidity in India.

Among the cardiovascular diseases acquired valvular heart diseases, hospital based studies have shown an average of 40% of cases are rheumatic valvular heart diseases of all patients admitted with heart diseases. One important category of cardiac disorders that affect a large number of patients who require diagnostic procedures and decisions regarding long-term management is valvular heart disease.[1] Severe symptomatic valvular heart diseases occurring in young age group is common in India, in particular, rheumatic heart disease is far more frequent than in the West (juvenile rheumatic heart disease).

Apart from rheumatic valvular diseases the other acquired valvular heart diseases are mitral valve prolapse syndrome, papillary muscle dysfunction, the rupture of chordae tendinae, calcified mitral annulus, calcified aortic stenosis, aortic regurgitation due to syphilis, connective tissue disorders (Marfan's Syndrome, osteogenesis imperfecta and systemic lupus erythematosis), atherosclerosis, hypertension and infective endocarditis. Other less common causes are recurrent pulmonary embolism, tuberculosis, cardiac tumours, carcinoid tumours, cardiac surgery for congenital cardiac anomalies and trauma.

The patients with acquired valvular heart diseases present to the physician with varying clinical symptomatology. The common symptoms are dyspnoea, orthopnoea, palpitations, chest pain, syncopal attacks, easy fatiguability, and symptoms of cardiac failure, infective endocarditis and thromboembolism.

Pulmonary valve disease and mitral regurgitation are usually asymptomatic unless complications occur. Left side valvular lesions present with symptoms of left heart failure first, whereas right side valvular lesions first present with right heart failure, then both progress to congestive heart failure.

INCIDENCE OF RHEUMATIC FEVER IN INDIA: The percentage of patients with rheumatic fever and rheumatic heart disease accounts for 1/3rd of the total cardiac admissions in most teaching hospitals. There were only a few population studies from our country[2,3,4,5,6] who observed as 27.6%-44.6% in their studies at various places in India. Roy[7] (1969) studied the rural population of Ballabgarh community block near Delhi, 4847 persons in age group 5-30 years in 8 randomly selected villages and observed a rheumatic heart disease prevalence rate of 2.2/thousand population.

An ICMR national school survey revealed a prevalence of rheumatic heart disease among school children (2/1000 to 11/1000) with national average of 6/1000.[8]

Recently a study conducted by Jacob Jose in 2002 has shown the prevalence to be 0.68/1000 children.[8] The adult average ranges between 123 and 200/100,000 population[9], when compared to industrialized nations the incidence of RF is 0.5/100,000 population and prevalence less than 0.05/1000.4.

The average age of patients with rheumatic heart disease is 15 years as compared to 37years in U.K. The time interval between the onset of symptoms of rheumatic fever and presentation of symptomatic disease is relatively short in India as compared to West. Severe mitral stenosis with severe pulmonary arterial hypertension and congestive heart failure may occur within 1-2 years of initial illness. Valvular calcification, atrial fibrillation and thromboembolic complications are less frequent in India when compared to West.

AIMS AND OBJECTIVES: To study the prevalence and clinical profile of rheumatic and non-rheumatic valvular heart disease in patients attending to Government General Hospital, Kakinada.

MATERIALS AND METHODS: 100 Adult patients with valvular abnormalities attending to the Medicine and Cardiology Units of Government General Hospital, Kakinada from Nov 2011 - May 2013 were studied. A detailed clinical history including various symptoms, past history of

rheumatic fever, followed by systemic examination was done. Specific findings of rhythm of pulse and rate, blood pressure, raised jugular venous pulse, oedema of feet, were noted for each patient. A detailed cardiovascular examination were noted for all patients. A chest x ray postero-anterior view, 12-lead electrocardiogram, echocardiographic evaluation was done. Ethical clearance certificate is obtained from Ethics Committee, Rangaraya Medical College, Kakinada.
Patients with congenital valvular heart diseases and cor-pulmonale are excluded in the study.

OBSERVATIONS AND RESULTS: The incidence of acquired valvular heart disease is higher in the age group of 31-40 years (32%) followed by 21-30 years age group (28%). (TABLE1). Our study also revealed relatively higher incidence of acquired valvular heart disease among the age groups of 51-60 years and above 60 years which is due to a relatively higher incidence of mitral regurgitation due to ischaemic heart disease in this same age group. Age incidence of rheumatic valvular heart disease as observed from our study indicates a high incidence among the age group of 21-30 years (38.23%) and 31-40 years (33.82%) (Table 2). A relatively higher incidence in the age group of 11-20 years i.e. 15% is probably due to the less number of cases studied. The acquired valvular heart disease is most common in male patients (56%). From our study, it is observed that the disease is commonest among low socio-economic group as per the guidelines provided by Aggarwal, et al.[10] Previous studies showed that rheumatic heart disease is more prevalent in underdeveloped and developing countries than in developed countries[11] and among the population with multiple social issues such as poverty, low socio-economic status (SES), overcrowded dwellings, under-nutrition, poor sanitation,[11] cultural constraints,[12] and suboptimal medical care.[13] The study conducted by Johnston revealed that there is direct relationship between low socio-economic status and rheumatic heart disease. In our study there are 68 cases of rheumatic valvular heart disease. This is followed by ischaemic heart disease and atherosclerotic disease. We have also noted 4 cases of hypertensive heart disease and 2 cases each of MVP and connective tissue diseases. (Table 3)

Out of 100 cases of acquired valvular heart disease the maximum brunt is borne by mitral valve. This valve is involved in 56 %. Rheumatic heart disease mitral valve is most commonly involved. Out of 68 cases 19 (27%) are with isolated MS, 10 (14%) cases with isolated MR, 12 (17%) cases with MS and MR, 9 (13%) cases are AS with AR and 18 cases (26%) with multi valvular heart disease. Aortic valve is involved in 26% of cases and both aortic and mitral valves are involved in 18% of cases. The commonest type of acquired valvular heart disease is isolated mitral valve regurgitation in 25% followed by isolated mitral stenosis (19%) (Table 4).

From our study of 68 cases of rheumatic valvular heart disease, it is observed that there is a positive history of rheumatic fever in 60.29% of cases, this is consistence with figures of western authors i.e. 60-70%.

Most of the patients with acquired valvular diseases presented with breathlessness (82%). The other frequent complaints are palpitations (64%) and chest pain (50%). Patients with syncopal attacks 6%, patients easy fatiguability 13% and 2% patients had haemoptysis. (Fig. 2)

Out of the 19 of cases mitral stenosis studied, the most common symptom is noted to be breathlessness (89.47%). This is probably related to early development of pulmonary congestion in these patients. Chest pain is present in 47.36% of patients related to right ventricular

hypertrophy and pulmonary hypertension. Palpitation is present in 8 cases (42.10%) of whom 6 have AF. 2 patients have haemoptysis and one patient is noted to have jaundice.

Out of 25 cases, 11 patients presented with breathlessness, 10 with palpitations and 6 with fatiguability. The relative less frequency of breathlessness in MR when compared to MS is due to late development of pulmonary hypertension. More frequency of fatiguability is due to reduced cardiac output. Chest pain in 8 cases all of them had ischaemic heart disease.

Patients with AR (62.50%) presented with breathlessness. This is in convenience of the fact that most patients with AR are asymptomatic. But symptoms do develop, dyspnoea and orthopnoea are the principal complaints. Two of our patients are having chest pain and 2 are having palpitations. (Fig. 3)

In our study it is observed that most common chest X-ray finding is cardiomegaly. Left heart border straightening is seen in 28 cases. Aortic calcification is seen in 2 cases with aortic valve calcification. From our study AF, LAE and RVH are more commonly seen in isolated MS cases. LVH is most commonly seen in patients with aortic stenosis. (TABLE 5) The most common isolated valvular lesion underlying in a patient with atrial fibrillation is noted to be mitral stenosis.

40% developed congestive heart failure, being the most common complication noted in our study. Patients with AF 22%. Infective endocarditis was noted in 5% cases, hemiplegia in 4% cases, and chorea in 1 case and Ortner's syndrome in 1 case. Pleural effusion is noted in 4 cases as a part of CHF which was resolved after treatment. (Fig. 4)

In patients with CHF, the most common underlying valvular heart disease is multi valvular lesion followed by mitral regurgitation. Eight of the patients have mitral stenosis and 4 patients have mitral stenosis with mitral regurgitation. None of the patients have isolated aortic valve involvement (Table 6). In our study out of 5 cases of infective endocarditis, 3 patients have multi valvular lesions, 1 patient with mitral stenosis and 1 with MS with MR.

In our study, there are 4 cases of hemiplegia. Two of them had MS, 1 patient had MR and 1 patient had multi valvular lesion. (Fig. 5)

DISCUSSION: 100 cases of acquired valvular heart diseases admitted in Government General Hospital, Kakinada were analysed.

About 68 cases were observed to be rheumatic in origin and 12 cases were ischaemic in origin and 12 were of atherosclerotic in origin indicating the rheumatic heart disease to be the most prevalent cause for acquired valvular heart disease. In our study most of the patients with acquired valvular heart disease are of low socio economic status. Our study coincides with Periwal KL et al.[11]

In our country rheumatic fever and rheumatic heart disease are very common compared to the west. Rheumatic fever is a social disease linked to poverty, overcrowding, poor housing[11,12,13] conditions and inadequate health services.[14] It declines sharply when standard of living is improved.

Out of 100 cases studied mitral valve involvement was noted in 56 cases indicating the most common valve to be involved is mitral valve. Out of this, 19% cases had mitral stenosis, 25% cases had mitral regurgitation and 12% cases are with MS+MR. Multi valvular lesions constituted 18% of cases and aortic valve involvement occurred in 26% cases. Siddharth Vinod

Lakhani et al[15,] observed 10% cases of mitral stenosis, 27% cases of isolated mitral regurgitation, 12% with MS+MR, 27.2% of aortic valve involved cases. Our study nearly correlates to the above study.

Among acquired valvular heart diseases isolated mitral regurgitation is most common. Among rheumatic valvular heart disease isolated MS (27%) is most common. Our results are coinciding with Sagie A, Freitas N, Padial LR, et al[16] (25%) of MS cases.

The peak age incidence of acquired valvular heart disease was found in the age group of 31-40 years which includes rheumatic, ischaemic, atherosclerotic and others.

The peak age incidence of rheumatic valvular heart disease was found in the age group of 21-30 years. In our study out of 68 cases of rheumatic valvular heart disease, 26 cases are of 21-30 years of age and 23 cases are 31-40 years of age. In a study conducted in rural Haryana prevalence of RHD was found to be high in patients below 30 years of age.

Male: Female ratio of 1.27: 1 indicating higher incidence among males (56%) than females (44%) due to additional ischaemic heart disease cases which occurred among males in acquired valvular heart disease. In a study done by SiddharthVinod Lakhani et al[15,] on clinical study of valvular heart disease in Mumbai during the period of 2010 – 2012, male to female ratio is observed to be 1.48:1. Among cases of rheumatic heart diseases females (51.47%) predominate over males (48.42%). A study done by kutumbiah[2] and a study done by Bonow RO et al[1] had similar findings. Study done by Benarjee[6] showed males 47.3% and females 52.63% had rheumatic valvular disease. The values in our study are comparable to the values in the above studies.

Breathlessness is the most common complaint among patients with acquired valvular heart disease seen in 82% of cases. The other frequent complaints are palpitations (64%), chest pain (50%), bilateral pedal edema (26%), cough with expectoration (24%). Easy fatiguability was observed in 13 patients most of them have mitral regurgitation. Patients with fever 11%. Syncopal attacks present in 6% of patients, all of them had aortic valve involvement. Two patients have haemoptysis and both of them have underlying mitral stenosis. Siddharth Vinod Lakhani et al[15] observed breathlessness in 88.8% cases, palpitations in 79.2% of cases and syncope in 4.8% of cases. Our study is comparable to the above study.

Out 0f 100 patients, 22 patients have irregularly irregular pulse. Mean systolic pressure in isolated MS is 120.48, in isolated MR -125.78, in isolated AR- 126.94, In isolated AS 124.46, and 122.02 in multivalvular lesions. Mean diastolic pressure in isolated MS 72.60, in isolated MR 76.24, in isolated AS 74.64 in isolated AR 48.65 and 78.42 in multivalvular lesion. Our findings were coinciding with a study done by SiddharthVinod Lakhani et al.[15]

In our study 22% of patients had AF. Mitral valve was involved in all cases of rheumatic heart disease with AF. RHD was the commonest cause of AF in a prospective study done in Himachal Pradesh by Rajeev Bharadwaj during the period of 2006 -2008[17] Left atrial enlargement was observed in 38 patients. Left ventricular hypertrophy was more common in patients with AR. Right ventricular hypertrophy was more common in patients with isolated MS. ST depressions and T wave inversions are seen in valvular diseases associated with coronary heart disease aortic valvular disease.

Echocardiogram is used to diagnose valvular heart diseases. On Echocardiography out of 19 cases of isolated MS, 5 were of severe degree, 8 were of moderate degree and 6 were mild MS cases. Cases with MR were 25. Cases with MS and MR were 12, cases with Aortic stenosis were 4, cases with AR were 8, cases with AS and AR were 14. Multi valvular heart disease were of 18 cases. Dilated left atrium and left ventricle are observed in patients with MR. Concentric hypertrophy of left ventricle was seen in patients with AS. LV size is increased in patients with chronic AR. Our results are comparable to study done by Siddharth Vinod Lakhani et al.[15] Suman bhandari et al.[18]

COMPLICATIONS: Congestive heart failure is the most common complication noted in our study in 40 patients. The valvular lesions in descending frequency in patients with CHF are combined valvular heart lesions - 16 cases (40%); mitral regurgitation - 12 cases (30%); mitral stenosis - 8 cases (20%) and aortic regurgitation - 4 cases (10%). Atrial fibrillation in 22% of cases, respiratory tract infections 6% of cases, infective endocarditis 5%of cases, hemiplegia in 4% of cases. Two patients had haemoptysis due to severe mitral stenosis. One patient had Ortner's syndrome who had mitral stenosis with regurgitation. Two patients with congestive heart failure had jaundice. In our study the most common complication was CHF. Study done by Siddharth Vinod Lakhani et al[15] also showed that the most common complication of valvular heart disease was congestive cardiac failure.

CONCLUSIONS: Rheumatic Heart Disease is leading cause of acquired valvular heart disease. Mitral valve involvement is the most common with Mitral regurgitation as the most common valvular lesion the acquired valvular heart disease is more common in males. Females are more affected in rheumatic valvular heart disease with mitral stenosis. Breathlessness is the most common complaint. Congestive heart failure being the common complication Multi valvular lesion is the most common valve involvement in patients presenting with congestive heart failure and infective endocarditis. Patients having atrial fibrillation are noted to have mitral stenosis more commonly. Left sided hemiplegia is common in patients with acquired valvular heart disease. The analysis of the present study gives us insight into the various types of presentation of acquired valvular heart disease and to increase awareness besides early detection of valvular diseases clinically. It also helps in planning of early treatment of valvular heart diseasest thus decreasing mortality and morbidity of acquired valvular disease.

REFERENCES:

1. Bonow RO, Carabello BA, Chatterjee K, et al: ACC/AHA 2006 guidelines for the management of patients with valvular heart disease: A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (writing committee to revise the 1998 Guidelines for the Management of Patients with Valvular Heart Disease): Developed in collaboration with the Society of Cardiovascular Anesthesiologists: endorsed by the Society for Cardiovascular Angiography and Interventions and the Society of Thoracic Surgeons. Circulation 2006; 114: e84.

2. Kutumbiah P. Rheumatism in childhood and adolescence.13. Part 1. Indian J Pediatr 1941; 8: 65-86.
3. Vakil RJ. Heart disease in India. 16. Am Heart J 1954; 48; 439-48.
4. Padmavathy S. Rheumatic fever and rheumatic heart disease in developing countries. Bull WHO 1978; 56: 543-55.
5. Malhotra RP, Gupta SP. Rheumatic heart disease in Punjab with special emphasis on clinical patterns that differ from those reported already. Indian Heart J 1963; 15: 107-13.
6. Benerjea JC. Incidence of rheumatic heart disease in India. Indian Heart J 1965; 17: 201 -2.
7. Roy SB. Prevalence of rheumatic fever and rheumatic heart 23. Disease in Ballabhgarh. Annual Report, Indian Council of Medical Research 1968-1969. p. 52.
8. Jacob Jose V, Gomathi M. Declining Prevalence of Rheumatic Heart Disease in Rural Schoolchildren in India: 2001–2002. Indian Heart J 2003; 55: 158–60.
9. Mathur KS, Wahal PK. Epidemiology of rheumatic heart disease-a study of 29,922 school children. Indian heart Journal 1982; 34: 367-71.
10. Aggarwal OP, Bashin SK, Sharma AK, Chaabre P, Aggarwal K, Rajouse OP. A new instrument (scale) for measuring socioeconomic status of a family: Preliminary study. Indian J Com Medicine 2005; 30: 111-4.
11. Periwal KL, Gupta BK, Panwar RB, Khatri PC, Raja S, Gupta R. Prevalence of rheumatic heart disease in school children in Bikaner: An echocardiographic study. J Assoc Physicians India 2006; 54: 279-82.
12. Mincham CM, Toussaint S, Mak BD, Plant AJ. Patient views on the management of rheumatic fever and rheumatic heart disease in the Kimberley: A qualitative study. Aust J Rural Health 2003; 11: 260-5.
13. Longo-Mbenza B, Bayekula M, Ngiyulu R, Kintoki VE, Bikangi NF, Seghers KV, et al. Survey of rheumatic heart disease in school children of Kinshasa town. Int J Cardiol 1998; 63: 287-94.
14. Meenakshisundaram R, Thirumalaikolundusubramanian P. Valvular heart disease in Indian subcontinent: Social issues. Indian J Community Med 2009; 34: 57-8.
15. Siddharth Vinod Lakhani, Vijay Krishna Joglekar. Clinical Study of Valvular Heart Disease. Journal of medical thesis 2013 july-sep; 1(1): 8-11.
16. Sagie A, Freitas N, Padial LR, et al: Doppler echocardiographic assessment of long-term progression of mitral stenosis in 103 patients: Valve area and right heart disease. J Am Coll Cardiol 1996.
17. Rajeev Bharadwaj, Atrial fibrillation in atertiary care institute e A prospective study, Indian heart journal 64(2012) 476-478.
18. Suman Bhandari, K Subramanyam, N Trehan. Valvular Heart Disease: Diagnosis and Management. Japi 2007; 25: 575.

Sl. No.	Age	No. of Cases
1	11-20	10
2	21-30	28
3	31-40	32

4	41-50	12
5	51-60	14
6	Above 60	4

Table 1: Age incidence of acquired Valvular Heart Diseases (n=100)

Sl. No.	Age (years)	No. of Cases	% of Cases
1	11-20	10	14.7%
2	21-30	26	38.23%
3	31-40	23	33.82%
4	41-50	6	8.82%
5	51-60	2	2.94%
6	Above 60	1	1.47%

Table 2: Age incidence of Rheumatic Valvular Heart Disease (n=68)

Sl. No.	Aetiology	No. of Cases / %
1	Rheumatic	68
2	Ischaemic	12
3	Atherosclerotic	12
4	Mitral valve prolapse	2
5	Hypertensive	4
6	Connective tissue disorder	2

Table 3: Etiology of Acquired Valvular Heart Diseases (n=100)

Sl. No.	Type of Valvular Lesion	No. of Cases/ Percentage
1	Mitral regurgitation	25
2	Mitral Stenosis	19
3	MS+MR	12
4	Aortic Stenosis	4
5	Aortic Regurgitation	8
6	AS+AR	14
7	Multi valvular lesion	18

Table 4: Incidence of different Valvular Lesions in Acquired Valvular Heart Disease (n=100)

Sl. No	ECG Findings	No. of Cases
1	Fibrillary waves	22
2	Left atrial enlargement	38
3	Left ventricular hypertrophy	36
4	Right ventricular hypertrophy	44
5	ST depression – T wave inversion	48

Table 5: ECG findings in Various Valvular Heart Diseases

SL. NO	Type of valvular lesion	No. of Cases	% of Cases
1	Mitral Stenosis	8	20%
2	Mitral Regurgitation	12	30%
3	MS+MR	4	10%
4	Aortic Stenosis	-	-
5	Aortic Regurgitation		-
6	Multi valvular lesion	16	40%

Table 6: Incidence of Different Valvular Lesions in Patients with Congestive Heart Failure (n=40)

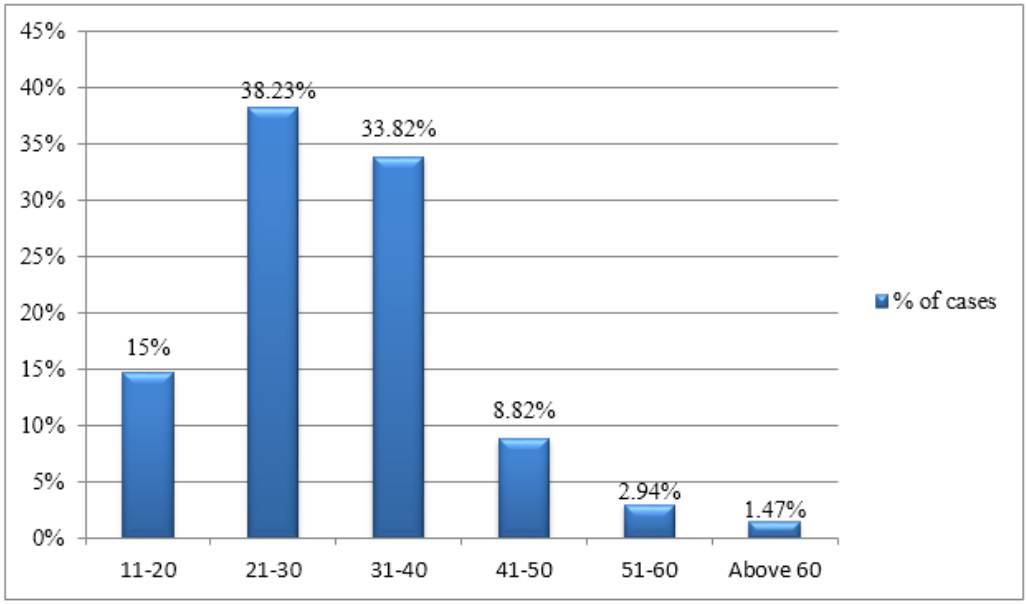

Fig. 1: Age Incidence of Rheumatic Valvular Heart Disease

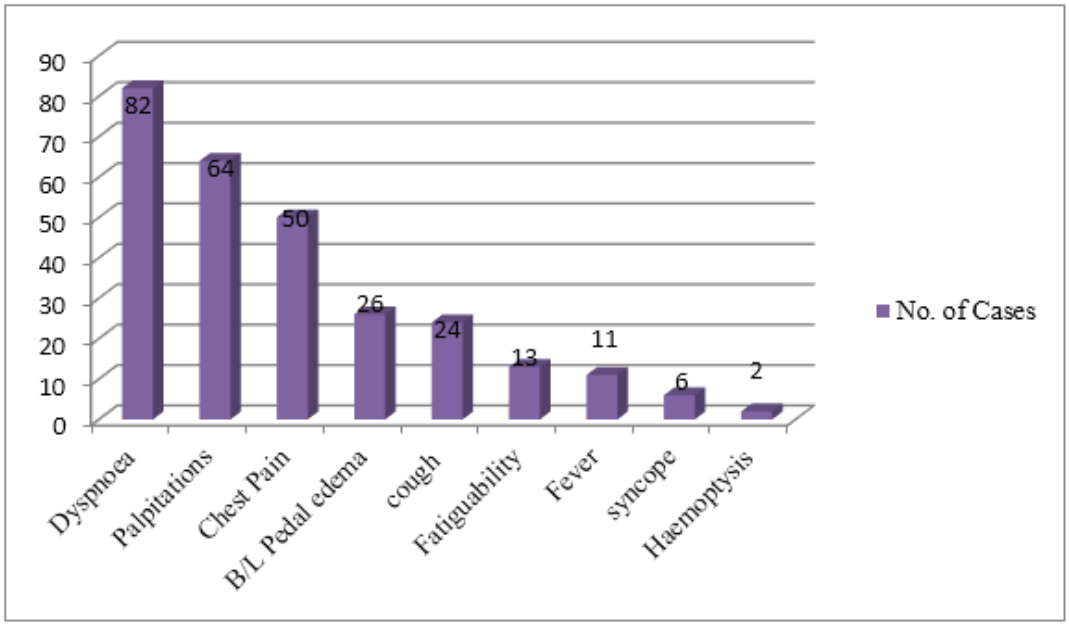

Fig. 2: Symptomatology of Acquired Valvular Heart Disease (n=100)

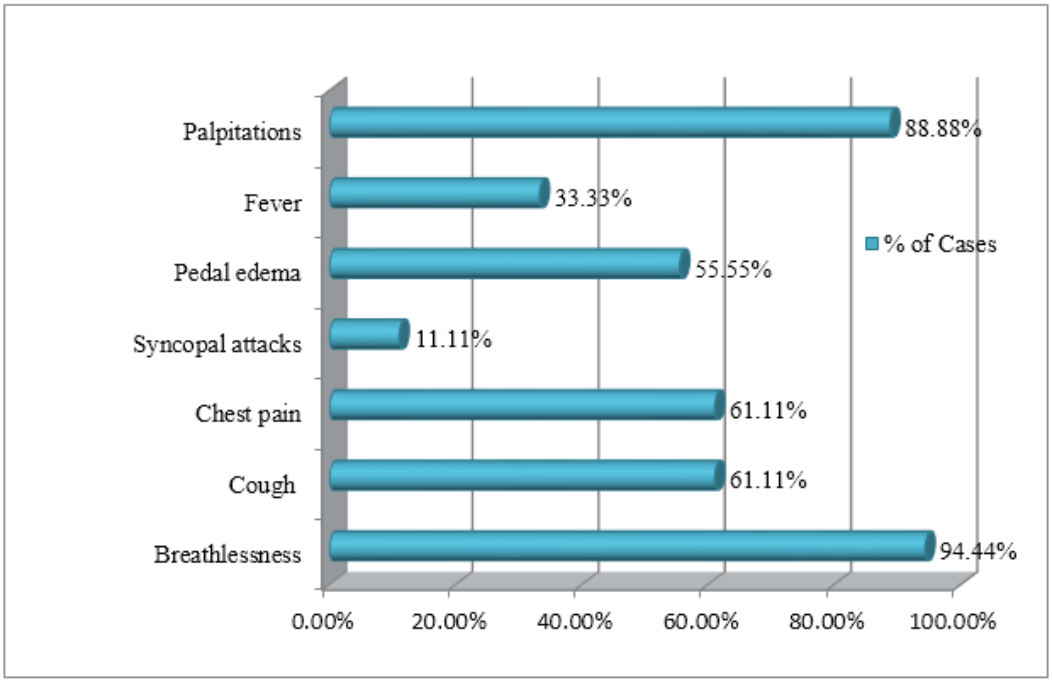

Fig. 3: Incidence of Various Symptoms in Patients with Multi-valvular Diseases (n=18)

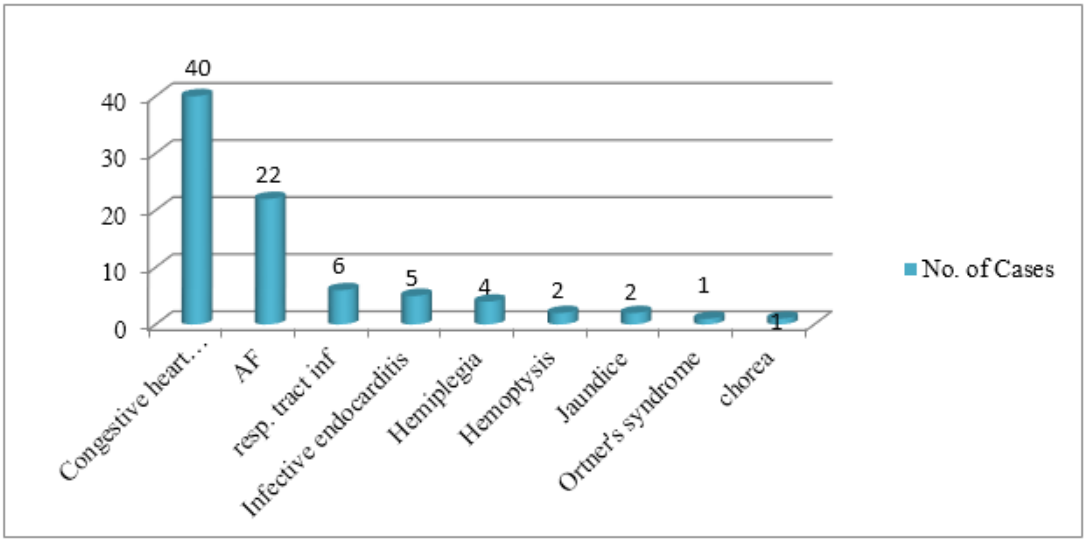

Fig. 4: Percentage of Incidence of Complications in Acquired Valvular Heart Diseases

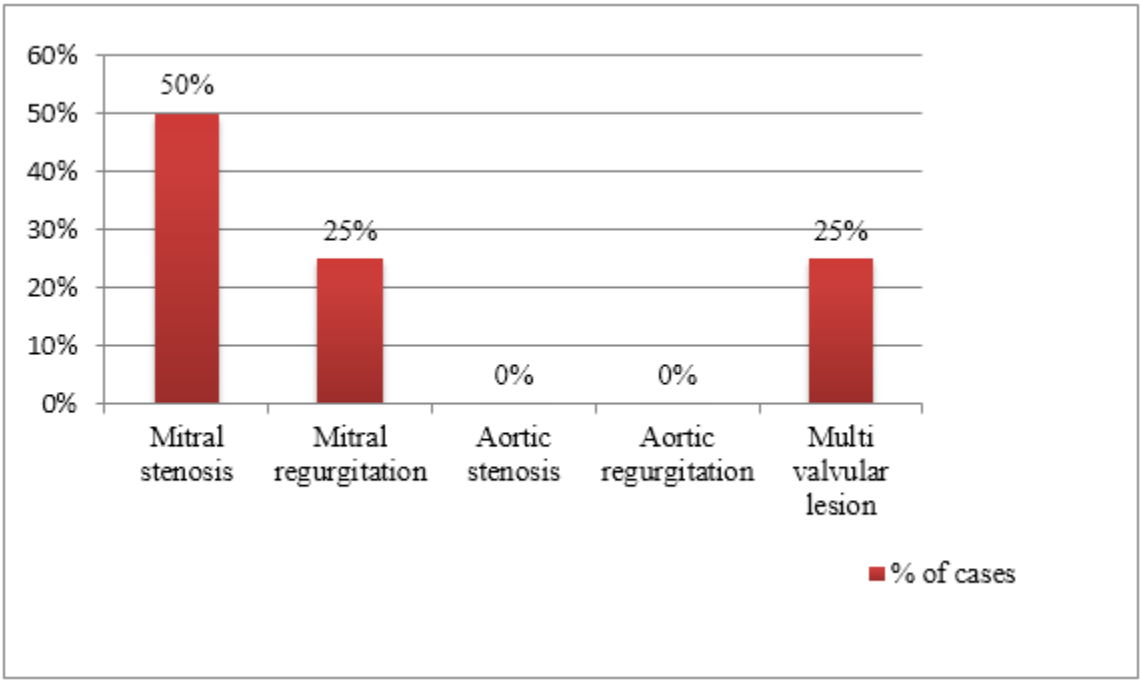

Fig. 5: Incidence of Different Valvular Lesions in Patients with Hemiplegia (n=4)

ORIGINAL ARTICLE

AUTHORS:

1. D. Radha Krishnan
2. V. Srinivas

PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Medicine, Rangaraya Medical College, Kakinada.
2. Senior Resident, Department of Medicine, Rangaraya Medical College, Kakinada.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. D. Radha Krishnan,
Associate Professor,
Department of Medicine,
GGH/RMC, Kakinada,
Andhra Pradesh.
E-mail: dr.desarajurk@yahoo.com

Date of Submission: 16/04/2015.
Date of Peer Review: 17/04/2015.
Date of Acceptance: 21/04/2015.
Date of Publishing: 29/04/2015.