

**CORRELATION BETWEEN CLINICAL SYMPTOMS AND ECHOCARDIOGRAPHIC RESULTS OF RHEUMATIC FEVER**<sup>1</sup>\*Dr. Muhammad Ammar Ajmal, <sup>2</sup>Dr. Hira Ahmad and <sup>3</sup>Dr. Hina Shahid,<sup>1</sup>PMDC # 87493-P.<sup>2</sup>PMDC # 82951-P.<sup>3</sup>PMDC # 94268-P.

\*Corresponding Author: Dr. Muhammad Ammar Ajmal

PMDC # 87493-P.

Article Received on 21/10/2018

Article Revised on 11/11/2018

Article Accepted on 02/12/2018

**ABSTRACT**

**Objective:** To assess the unrevealed prevalence, Clinical and Echocardiography features of patients with (RF/RHD) in rural population. 2) To highlight the importance of nationwide preventive measure to combat the challenge. **Methods:** Cross sectional survey of 11 villages having multiethnic composition were carried out using the scientific sampling techniques and screening methodology. Proven RHD patients were evaluated by history, detailed physical examination and Lab. tests including ECG, chest X-ray, Echo/Doppler studies. **Results:** Mean age was  $31 \pm 18.38$  years SD, with 35% of 20 years or less. Females had significant preponderance. More than half were in NYHA class II. Newly detected were 81%. The commonest symptom was dyspnea. History suggestive of RF was elicited in 56%. Patients with RI-ID but unaware of RF [Endocarditis prophylaxis] were 92%. 87% of RF/RHD disease continues to be a major scourge in developing countries like Pakistan.<sup>[1]</sup> The all RI-ID cases had either mild or moderate valvular deformity. The commonest lesion was combined mitral and aortic valve disease. The most frequent, isolated valvular lesion was mitral stenosis (MS). Juvenile MS was present in 15%. Conclusion: In our survey, we found a large reservoir of teenage patients, one third < 20 years with RHD/RF. Newly detected 80% asymptomatic patients, were unaware of their disease. Additionally (92%) were ignorant about rheumatic prophylaxis. This highlights alarming facts about the concealed prevalence of RHD and ignorance among the public about their disease. It justifies nationwide emergency community oriented preventive measures and public awareness campaigns, to fight this crippling disease of the youngsters. clinical manifestations of RF / RHD has been reported in various studies based on hospital data.<sup>[2,3,4]</sup> Hospitalized patients are usually sick and have advanced RHD. As such, they do not represent the true disease prevalence of the community. To unveil the concealed disease burden and clinical spectrum, door to door search is mandatory, to identify patients in communities through cross sectional survey.

**KEYWORDS:** RF/RHD, valvular.**INTRODUCTION**

Studies concerning clinical findings of these patients have been published from tertiary care centers located in big cities catering mostly urban population.<sup>[5,6]</sup> The disease pattern in rural communities (70 % of our country population), is largely unknown.

Therefore a large cross sectional survey of short axis view. Mitral valve area (MVA) was rural areas around Lahore was carried determined by planimetry the mitral valve out with an objective to determine the true disease orifice echoes along their internal margins on burden and pattern of RF/RHD. Additionally to frozen images. Care was taken to assess MVA at highlight the justification for Nationwide the tip of mitral leaflets at early diastole according community oriented preventive measures and to the method of Henry et al. 9 The

Doppler public awareness campaigns. pressure half time (PHT) technique was also adopted to measure MVA particularly in patients

Methods with poor quality 2-1) images, marked sub valvular disease or post surgical commissurotomies.<sup>[10]</sup> 2) The details of survey methodology have been directed M-mode measurements were done discussed in our article elsewhere. 1 In proven case according to the recommendation of American of RF/RHD history regarding present and past Society for Echocardiography.<sup>[8]</sup> Qualitative illness was obtained with the help of Performa. diagnosis of stenotic lesions were based on New York Heart association (NYHA) functional class/ restricted opening of the valve leaflets. class was assessed by the present cardiac Echocardiographic quantification of valvular symptoms.

History of RF was interrogated, stenosis was calculated on valve areas and following updated Jones criteria 1992 by pressure gradient derived by using Bernoulli's American Heart Association Task Force on equation. Incompetent/regurgitant valvular lesions RF/RHD<sup>[7]</sup> Any past illness heart valve disease, were diagnosed when significant regurgitant jet rheumatic prophylaxis and cardiac surgery was present on conventional Doppler study in the particularly asked. Thorough general and systemic preceding chamber. Semiquantification of physical examination was carried out. 12 — Leads regurgitative lesions were carried out as described surface ECG, X- Ray chest PA view, complete by Pearlman A.S.<sup>[11]</sup> blood examination, urine analysis and throat cultures were done as routine examination in every RESULTS case.

Total numbers of patients were 54. Women Echocardiography had significantly higher prevalence than males, with the ratio of 1: 2.37. (P = 0.005) Age ranged M-mode/ 2D echocardiogram with between 7-70 years with mean of  $31 \pm 18.38$  years conventional Doppler examination was performed SD. 81% patients were newly detected. Only ten using Toshiba SSH 60A model having 2.5 and patients knew their heart valve disease previously 3.75, MHZ transducer with PW and

CW and three of them were on rheumatic prophylaxis. capabilities. CW pencil probe was also used in 92 % of all proven REID patients were unaware of evaluation of gradient in certain cases. All studies rheumatic prophylaxis. Four patients had were recorded on 180-National video tapes using undergone cardiac surgery. Two third patients were VCR, model No.'BR-6400TB, Toshiba medical either in NYHA class I or II and 15% were in class system. Print out of necessary frozen images were III and one patient in class IV. 35% of patients taken through sono printer TP 8300. Patients were with RI-ID were twenty years or less. Juvenile examined in supine, left lateral and right lateral mitral regurgitation (26%) was more common than positions. In each study standard and modified Juvenile mitral stenosis (15%). echocardiographic images were obtained in the parasternal long and short axis views and the The commonest lesions were combined mitral apical four chambers, two chambers and long axis and aortic valve disease. The most frequent view.7•8 The mitral valve orifice was examined in isolated lesion was mitral stenosis followed by pure mitral regurgitation. No patients with pure aortic stenosis were encountered in the whole survey, Table (1) Only 13% had severe valvular deformity and rest of the patients had either mild or moderate lesions. Table (2)

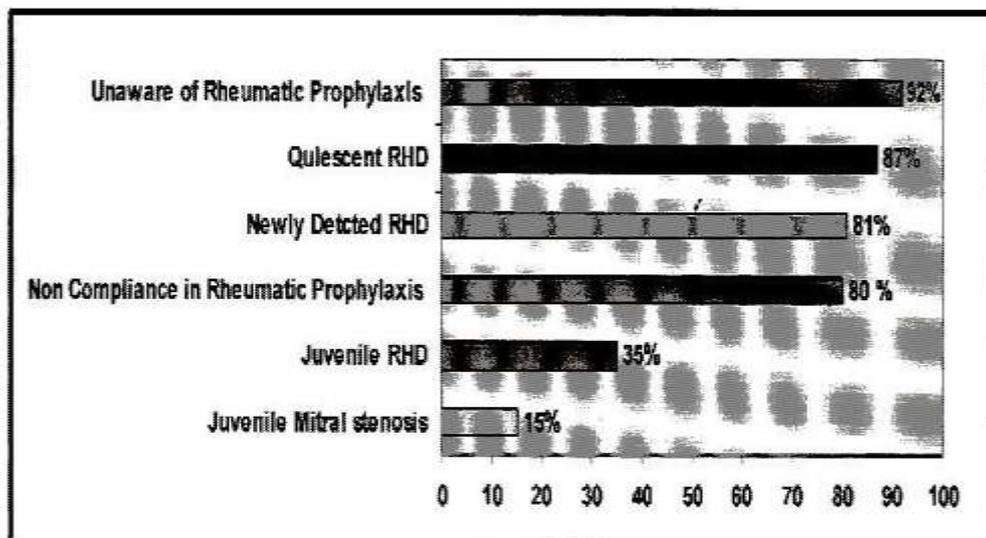


Fig. I: Unique and Disturbing Facts of the Study.

Table 1: Pattern of Rheumatic heart disease in rural Punjab.

Valvular Lesions (S)	Numbers	Percentage
Aortic and mitral valve disease	17	31
Miffal stenosis	13	24
Mitral regurgitation.	11	21
Mitral stenosis and regurgitation	8	15
Aortic regurgitation.	3	5
Aortic stenosis and regurgitation.		2
Mitral and tricuspid valve.		2
Total	54	100

**Table 2: Grading of Rheumatic heart disease by individual Lesions.**

Lesions	Mild	Moderate	Severe	Total
	11 (35%)		403%	31000%)
MS				100%)
AS			1 (20%)	
AR				1000%)
Total				1000%)

The commonest symptoms was dyspnoea followed by palpitation and atypical chest pain. Dizziness and paroxysmal nocturnal dyspnoea were complained in equal frequency, 7.5% has hemoptysis. Only two patients suffered from syncopal attacks and acute pulmonary oedema. Thirty cases (56%) recalled history suggestive of acute rheumatic fever.

Arthralgia was the most frequent symptom remembered by the patients. Sore throat was present in 43%. Painful swollen joints producing difficulty in walking (limp) was reported in 41%. The commonest combination was joint pain/limp and recurrent fever. Chorea was present in 4%. Skin rashes and nodules were reported in only 2%.

Electrocardiographic abnormalities were detected in 70%, LVH (30%), LAE (28%), AF (7%). RVH (3%). Cardiomegaly were present in 30% of all cases on chest roentgenogram, half of them have mild cardiomegaly and 1/3 moderate and 20% had severe cardiomegaly. Throat swab examination was negative in 67% and among positive throat cultures, 80% showed 13 hemolytic streptococci (*Streptococcus pyogenes*), two patients revealed *Pseudomonas* and *Staphylococcus aureus* respectively.

**Mitral Stenosis:** Thirty patients had MS (13 pure and 17 had combined MS) Left atrial size ranges between 19-66 mm with mean of 38mm. 3% had clot, 10% calcification, and subvalvular disease in 16%, Mitral valve area cm<sup>2</sup> in 5 cases, 1-1.5 cm<sup>2</sup> in 9 and > 1.5 cm<sup>2</sup> in 16 patients. The average peak and mean diastolic pressure gradient across mitral valve was 11 and 6 mm Hg respectively. Mean 2-D and Doppler MVA had close correlation. Pulmonary HTN was present in 7 patients.

**Mitral Regurgitation:** MR was present in 31 cases, 11 had isolated MR and 20 patients had combined form. Patients with isolated or predominant MR revealed left ventricular volume over load. Mean ejection fraction (EF) was 72% (range 39-85%). Mean LA size was 40 mm with range of 30-60 mm. 4% had thrombus in LA. One patient had large vegetation on MV. Calcification and subvalvular disease was present in 4%. CW Doppler studies gave an average peak diastolic/ mean pressure gradient of 8/4, (range 3-16/ 2-6). Four patients had functional TR. Pulmonary artery systolic pressure was less than 50 mm Hg in three cases and one patient had 70 mm Hg.

**Aortic Regurgitation:** Sixteen patients were suffering from AR, three had pure AR and thirteen cases were mixed mitral and aortic valve disease. All had LVVO with preserved LV function, (mean EF. 74%, range 54-81%). Mean LA size was slightly less than MR (38 mm). One patient had thrombus in LA. Two patients had TR with mild and moderate pulmonary HTN.

**Tricuspid stenosis and regurgitation:** Only one patient had TS and TR combined with MVI).

## DISCUSSION

Clinical and echocardiographic manifestation of RF/RHD in this study are quite different from facility based data because the whole spectrum spanning from mild to severe disease were encountered in this survey. Juvenile cases were detected in 35% of all RHD and to the best of our knowledge this is the highest reported rate for Juvenile RHD<sup>[12,13]</sup> Majority of these patients were suffering from multi valvular disease depicting the typical picture of "malignant" RHD in developing countries. The high prevalence of Juvenile RI-ID may be due to asymptomatic or mildly symptomatic nature of disease (87% patients were in NYHA class I & II). Patients do not seek proper medical attention and get treatment from health workers and Hakims and this delays the early detection of this disease.

The significant dominance of female patients in current study is in consistent with reports of many workers. Hospital based data favor frequent male presentation because of more hospital utilization is by the male gender. In contrast the present study is community based and not effected by this factor. In rural Pakistan female had privilege of more private life, natural shyness and avoidance of attending male doctors at hospitals, this delays the unmasking of mild to moderate disease, thus leading to enormous number of female patients.

**Pattern of RHD:** MR was the commonest valvular lesion occurring in 31 patients (20 cases in combined form and 11 as an isolated lesions).<sup>[14]</sup> Next common lesion was MS, out of total 30 cases, 17 in mixed form and 13 as isolated. The commonest isolated valvular lesion was MS. Ilyas et al, Koshi et al and Berry, N.J et al in their prevalence survey for chronic RHD detected similar pattern of RHD as in our study. No pure Aortic stenosis or isolated tricuspid valve disease encountered. It is apparent from this study and most of other comparative population based studies, that mitral valve involvement is so frequent that RI-ID appears primarily a disease of

mitral valve. Roberts inferred from his large series of autopsies that mitral valve is always affected anatomically although it may be function normally and according to him RHD never involves aortic valve alone and if this valve is only affected other etiologies must be sought.<sup>[18]</sup> Only 3 patients had AR with strong history of RE. In older studies, aortic valve disease had been frequently reported which might be non-rheumatic in origin.

We were able to elucidate history of RF in 56% of our patients. This figure is quite close to the distant studies and data from Pakistan. Ilyas et al had reported 53% history of RF in their Chitral series.<sup>[15]</sup> Local customs, ignorance, traditional beliefs and low socio-economic status have been suggested to account for the low prevalence of past history of RE. It may also indicate a common tendency of RF to present in milder form or with PJC. Vol 21, January — carditis alone. Arthralgia, recurrent fever and sore throat was frequently described by our patients (40-58%) which is usually taken as minor illness and proper treatment is not sought thus leading to RHD in de novo. This combination has been reported by Syed A.S and Aziz K.U.<sup>[4]</sup> Primary prevention becomes very difficult when sore throat is ignored as mild disease and even in affluent societies, two thirds of patients with proven ARF do not give history of pharyngitis. In our setting where literacy<sup>[1]</sup> rate is very low and medical facilities are negligible the consequences will be more serious, as has been discovered in this survey, a large reservoir of silent RHD. Rheumatic Prophylaxis

Considering all RI-ID cases about 92% patients were not aware of rheumatic or SBE prophylaxis. This is of particular concern that large number of undetected patients can be saved if secondary prevention is instituted in time and this is only possible if case finding studies are available at national level. Failure to compliance recorded in 80% of our known RI-ID patients. It is emphasized to educate the intense importance of secondary prophylaxis among local general practitioners and public at large through whatever means/ media can be adopted for this. Echocardiography

This is the first field study in Pakistan where echo Doppler were used to confirm the diagnoses. This modality has established role in the evaluation of murmur. Many clinically diagnosed functional/innocent murmurs may be pathological and vice versa. We have evaluated all systolic murmurs greater than grade 2/6, apical systolic murmurs and diastolic murmurs irrespective of their grade by echo/ Doppler study to define the underlying causes. 140 suspect murmurs on initial screening had no underlying pathology, thus preventing us in over diagnosing RI-ID in 35% as had been observed in studies before echo era.<sup>[15]</sup>

## CONCLUSION

The clinical and echo features of RHD indicate enormous number of patients suffering from undetected mild or moderate disease without rheumatic prophylaxis. picture is in sharp contrast to hospital-based data. Disease burden is enormous and ignorance about disease among patient is unacceptably high. It is strongly recommended to under take nation wide survey to discover the true disease burden "quiescent" RHD for the implementation of immediate and effective secondary RF prophylaxis to prevent the disability and high mortality in young individuals. Revolutionary efforts are required to combat crippling disease of the youngsters not in the hospitals but in the streets of villages and cities. It is only possible through motivated public and private joint venture as is seen in Polio prevention program because the disability and mortality is for higher than Poliomyelitis.

## REFERENCES

1. S F Rizvi, M A Khan, A Kundi, D R Marsh, A Samad O Pasha Status of rheumatic heart disease in rural Pakistan. *Heart*: 2004 9:394-399.
2. Robinson et al, Acute Rheumatic Fever in Karachi, Pakistan. *The American Journal of Cardiology*, 1966; (18): 548-551.
3. Syed. A. A., Raza, M., Hashmi. J. A. et al. Establishment of comprehensive research and Rehabilitation program for persons of various forms of heart disease, "Project, V.
4. R. A. Pak 8-66, National Institute of Cardiovascular Disease, Karachi.
5. Aziz K. U et al. Rheumatic Fever and Carditis at the National Institute of Cardiovascular Diseases, A Follow up Study. *J.P.M.A.* 1986;8(36)196-202.
6. Aziz K.U. Rheumatic Heart Disease, Diagnosis and management, *Medical Progress*, January, 1987; 21-29.
7. Rahimatoola RJ, Shafaqat H, Ramzan A. Acute rheumatic heart fever and rheumatic carditis in children. *Pak Heart J*, 1980; 3: 2-8.
8. Dajani AS, Ayoub E, Bierman FZ, et al. Guideline for the diagnosis of rheumatic fever: Jones criteria, updated 1992. *Circulation*, 1993; 87: 302.
9. American Society of Echocardiography Committee on standard. Recommendation for quantification of the left ventricle by twodimensional echocardiography. *J Am Soc Echocardiography*, 1989; 2: 358-367.
10. Henry W. L., et al. Measurement of mitral orifice area in patients with mitral valve disease by real time, two-dimensional echocardiography. *Circulation*, 1975; 51: 827.
11. Hatle, L., BrubkkaA, Tromsdal., A., Angclesen., B. Non-invasive assessment of pressure drop in mitral stenosis by Doppler ultrasound. *British Heart J*, 1978;40:131-148.

12. Pearlman, A. S., Otto, C. M. Quantification of valvular regurgitation Echocardiography, 1987; 4: 271-287.
13. Roy, S. B. et al. Juvenile mitral stenosis in India, LancetPJC, 1963;2,11; 4: 2011.
14. Yuko-Jowi C, Bakari M. Echocardiology patterns of Juvenile rheumatic heart disease at the kenyatta National Hospital, Nairobi, 2005; 82 (10): 514-9.
15. Ravisha MS, Tullu MS, Kamat JR. Rheumatic fever and rheumatic heart disease: clinical profile of 550 cases in India 3:34(5):382-7.
16. Ilyas, M. Peracha, M. A. Ahmed, R. et al. Prevalence and pattern of Rheumatic Heart Disease in the Frontier province of Pakistan, J. P. M. A. 1979;29:165-179.
17. Koshi, G. V. Benjamin and George Cherian, •Rheumatic fever and Rheumatic Heart diseases in rural south Indian children: Bulletin of the World Health Organization 1:59599-603.
18. Berry, J. N. Prevalence survey for chronic rheumatic heart disease and rheumatic fever in northern India. British heart. Journal 1972;34:143-149.
19. Roberts, W.C, Morphologic aspects of cardiac valve dysfunction, American Heart Journal, 1992; 123(6), (1610-1632).