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ADHERENCE TO SECONDARY PROPHYLAXIS OF RHEUMATIC FEVER IN PATIENTS WITH RHEUMATIC HEART DISEASE IN RURAL AREAS

Jawaid Akbar Sial[1], Muhammad Tariq Farman[2], Mahesh Kumar Batra[3], Musa Karim[4]

[1,3,4]Cardiology National Institute of Cardiovascular Diseases (NICVD) Karachi-Pakistan
[2]Cardiology Dow International Medical College (DIMC), Dow University of Health Sciences, Karachi-Pakistan

Address for Correspondence:

Jawaid Akbar Sial

Department of Cardiology at National Institute of Cardiovascular Disease (NICVD), Karachi-Pakistan

Emails: drjawaids@yahoo.com

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Contribution

JAS conceived, designed and did statistical analysis & manuscript writing. MTF and MKB, did data collection and manuscript writing. KM did review and final approval of manuscript

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ABSTRACT

Objective: To determine adherence to secondary prophylaxis of rheumatic fever in patients with rheumatic heart disease presenting to cardiology department.

Methodology: This cross-sectional study was conducted at Cardiology department of Chandka Medical College Larkana from 15th January to 14th April 2015. Patients with documented history of rheumatic heart disease (RHD) of 1 year presenting either to emergency or outpatient department were included. Frequency of intramuscular benzathine penicillin injection during last one year was recorded. Patients with frequency of at least 12 injections, i.e. 80% of the expected injections, per year were classified as adherent. Collected data was entered and analyzed using SPSS version 21. P Ü 0.05 was taken as criteria for statistical significance.

Results: Total 102 patients were included in study out of which 70 (68.8%) were females. Age of the patients range from 11 years to 70 years with mean of 34.09 ± 16.22 years. About 70 (68.8%) patients presented to out patients department. All patients had mitral valve involvement and 12 (11.8%) patients had aortic valve involvement along with mitral valve. LV dysfunction was not present in majority the patients 73 (71.6%). Total of 75 (73.5%) patients were adherent to the secondary prophylaxis. Significantly lesser adherence was observed among the patients presenting to emergency department [19 (59.4%) vs. 56 (80.0%)] p=0.028. Adherence was found to be strongly associated with valvular lesion.(p=0.009).

Conclusion: Secondary prophylaxis for rheumatic fever was being utilized by three quarter of patients and it was correlated with age and type of valvular lesions.

Key Words: Rheumatic Fever, Rheumatic Heart Disease, Adherence, Secondary Prophylaxis, Penicillin

INTRODUCTION

Repeated episodes of acute rheumatic fever (ARF) are associated with heart inflammation, which may cause damage to the heart mitral or aortic valve. Such chronic condition is known as rheumatic heart disease (RHD).[1] By 1980s, the developed countries were almost free of RHD with the widespread use of penicillin and overall improvement in leaving conditions.[2,3] However, it remains one of the leading non-communicable disease causing leading mortalities and morbidities in underdeveloped and developing world.[4-7] High prevalence of RHD among the population of middle to low income countries is mostly associated with poor health care conditions, poor sanitations, high population density, and other social determinants.[3,8]

Owing to the subclinical nature of diseases, implementation of any primary preventive strategy for the rheumatic heart disease is difficult in low to middle income countries.[1,9]Thus, World Health Organization (WHO), since the 1980s, promote secondary preventive measures as a control program of the pandemic.[3,10]Aim of this control program is to protect patients who are already diagnosed with rheumatic heart disease (RHD) from reoccurrence of acute rheumatic fever.[1,10] Preventive measures include administration of weight adjusted dosage of antibiotic prophylaxis, intramuscular benzathine penicillin injection, at every 3-4 weeks.[11]

Undoubtedly, antibiotic prophylaxis proved to be an efficient and cost effective strategy in reducing the rate of recurrent attack of acute rheumatic fever (ARF) in patients with rheumatic heart disease (RHD).[12,13]However, low adherence to secondary prophylaxis in our population remains the leading barrier in the eradication of this epidemic. A systematic review by Asghar and colleagues reported prevalence of rheumatic heart disease in 14.6 per 900 patients to 16.2 per 1100 patients.[4]

Thus, aim of this study was to determine adherence to secondary prophylaxis of rheumatic fever among the patients with rheumatic heart disease at rural areas of Sindh.

METHODOLOGY

This cross-sectional study was conducted at Cardiology Department of Chandka Medical College, Larkana from 15th January 2015 to 14th April 2015. Prior to commencement of the study approval of institutional ethical review committee was taken. Consecutive patients with documented history of rheumatic heart disease (RHD) presenting either to emergency or outpatient department were included. Prior to inclusion, importance and befits of the study were explained and inform consent was taken from all the enrolled patients. Patients diagnosed with rheumatic heart disease (RHD) for at least one year were included. Patient's demographic data and disease anatomy were obtained from patient's medical record and direct questionnaire. Frequency of intramuscular benzathine penicillin injection during last one year was recorded based on medical record or direct questionnaire. Based on the World Health Organization (WHO) recommendation of once at every three to four weeks. Approximately 15 injections per year were calculated. Patients with frequency of at least 12 injections, i.e. 80% of the expected injections, per year were classified as adherent.

Collected data was entered and analyzed using SPSS version 21. Categorical variables were expressed as frequency and percentage. Minimum, maximum, and mean ± standard deviation (SD) were calculated for continuous variables. Chi-square test was performed to assess the adherence by demographic and baseline characteristics. Two sided p Ü 0.05 was taken as criteria for statistical significance.

RESULTS

Total of 102 patients were included in study out of which 70 (68.8%) were females with age ranging from 11 years to 70 years with mean age of 34.09 ± 16.22 years. About 70 (68.8%) patients presented through outpatients department. All patients had mitral valve involvement and 12 (11.8%) patients had aortic valve involvement along with mitral valve. LV dysfunction was not present in 73 (71.6%) patients. Characteristics of the patients are presented in Table 1. Out of total patients 75 (73.5%) patients were adherent to the secondary prophylaxis with frequency of once every month (4 weeks). Significantly lesser adherence was observed among the patients presenting to emergency department 19 (59.4%) vs. 56 (80.0%) in OPD ($p = 0.028$). Adherence was observed to be lower among the patients of age more than 30 years [32 (65.3%) vs. 43 (81.1%)]. Adherence was found to be strongly associated with valvular lesion($p = 0.009$) with lesser adherence among patients with aortic stenosis (16.7%) and aortic regurgitation (62.5%) as compared to the patients with mitral stenosis (78.6%) and mitral regurgitation (78.1%). Baseline characteristics of the patients adherent to prophylaxis in comparison to non adherent patients is shown in table 2.

Table 1: Baseline Characteristics of the Patients (n=102)

Baseline Characteristics	Frequency (%)
Gender	
Male	32(31.4)
Female	70(68.6)
Age [Mean ± SD]	34.09 ± 16.22 years
Up to 30 years	53(52.0)
More than 30 years	49(48.0)
Valvular Lesion	
Mitral Stenosis (MS)	56(54.9)
Mitral Regurgitation (MR)	32(31 4)
Aortic Stenosis (AS)	6(5 9)
Aortic Regurgitation (AR)	8(7.8)
Estimated Duration of RHD [Mean ± SD]	4.94 ± 4.84 years
Up to 3 years	54(52.9)
More than 3 years	48(47.1)
LV dysfunction	
None	73(71.6)
Mild	20(19. 6)
Moderate	7(6.9)
Severe	2(2.0)
SD = Standard Deviation, LV = Left Ventricular	

Table 2: Comparison of the Patients Adherent to Prophylaxis to non Adherent (n=102)

Baseline Characteristics	Adherent (n%)	Non Adherent	**p-value
Male	24 (75.0)	8 (25.0)	0.82
Female	51 (72.9)	19 (27.1)	
Age			
Up to 30 years	43 (81.1)	10 (18.9)	0.07
More than 30 years	32 (65.3)	17 (34.7)	
Presenting Department			
Outpatient Department	56 (80.0)	14 (20.0)	0.028*
Emergency Department	19 (59.4)	13 (40.6)	
Valvular Lesion			
Mitral Stenosis (MS)	44 (78.6)	12 (21.4)	0.009*
Mitral Regurgitation (MR)	25 (78.1)	7 (21.9)	
Aortic Stenosis (AS)	1 (16.7)	5 (83.3)	
Aortic Regurgitation (AR)	5 (62.5)	3 (37.5)	
Duration of RHD			
Up to 3 years	40 (74.1)	14 (25.9)	0.895
More than 3 years	35 (72.9)	13 (27.1)	
LV dysfunction			
Normal	58 (79.5)	15 (20.6)	0.089
Mild	11 (55)	9 (45)	
Moderate	4 (57.1)	3 (42.9)	
Severe	2 (100)	0 (0)	

LV = Left Ventricular, RHD=Rheumatic Heart Disease **P-value are based on chi-square test * Significant at 5% level of significance

DISCUSSION

We have enrolled 102 patients diagnosed with rheumatic heart disease. About 73.5% of them were adherent with once every month (4 weeks) frequency of intramuscular benzathine penicillin injection. In our study adherence was lower among the patients presented to emergency department, with adherence rate of 59.4% vs. 80.0%, as against patients visiting to outpatient department (OPD). With these findings subsequent studies are needed to assess, whether non adherence to the secondary prophylaxis among the patients with rheumatic heart disease leads to higher rate of emergency visits.

Adherence to the secondary prophylaxis in our population is quite high compared to 52% compliance among South Indian population, as reported by Nemani L et al., 46% reported compliance for New Caledonia reported by Gasse B et al., 54% of adherence to the monthly benzapen prophylaxis among the population of Uganda, as reported by Musoke C et al., and 48.7% adherence rate among patients in Jamaica, as reported by Thompson SB et al.[9,10,14,15]

Strong association was observed between adherence and valvular lesion, patients with mitral stenosis and mitral regurgitation have relatively better adherence, 78.6% and 78.1% respectively, than the patients with aortic stenosis and aortic regurgitation, 16.7% and 62.5% respectively. Similarly, young patients (up to 30 years of age) were relatively more adherent, 81.1% vs. 65.3%, but statistically insignificant with p-value of 0.07. Duration of rheumatic heart disease of the patients does not have any statistically significant association with rate of adherence to the secondary prophylaxis for rheumatic fever. Similarly, no significant association of adherence was observed with gender in our study with p-value of 0.82. On the contrary study conducted by Nemani L et al. male gender had statistically significant association with non-adherence.[9]

Factors leading to poor adherence among the patients are not studied in our study, however, lack of knowledge, rural or semi urban residency, painful nature of injection, affordability, long commutes, lack of transportation, and long waiting hours at the center are the key factors reported in past studies.[9,14,15]

Eradication of rheumatic heart disease (RHD) is not possible without promoting positive attitude towards secondary preventive measures such as adherence to the secondary prophylaxis of rheumatic fever among the patients with rheumatic heart disease in our population. Therefore, it is important for health institutions, governing bodies, and health professionals to work together and promote awareness and educate patients regarding the benefits and importance of these secondary preventive measures.

LIMITATIONS

This study is a single center study with small geographic coverage and small sample size. Owing to these limitations, generalization of the findings of this research is limited to specific population segment. Further multicenter researches with national representative sample size are needed to understand the national behavior.

CONCLUSION

Secondary prophylaxis for rheumatic fever was being utilized by three quarter of patients and it correlated with age and type of valvular lesions.

REFERENCES

1. Rémond MG, Coyle ME, Mills JE, Maguire GP. Approaches to improving adherence to secondary prophylaxis for rheumatic fever and rheumatic heart disease: a literature review with a global perspective. Cardiol Rev 2016;24(2):94-8.
2. Marijon E, Celermajer DS, Jouven X. Rheumatic heart disease: an iceberg in tropical waters. N Engl J Med 2017;377(8):780-1.
3. Watkins DA, Johnson CO, Colquhoun SM, Karthikeyan G, Beaton A, Bukhman G, et al. Global, regional, and national burden of rheumatic heart disease, 1990–2015. N Engl J Med 2017;377(8):713-22.
4. Asghar U, Ghauri F, Naeem MT, Amjad M. Prevalence of rheumatic heart disease in different regions of Pakistan. Pak J Med Health Sci 2017;11(3):1049-52.
5. Seckeler MD, Hoke TR. The worldwide epidemiology of acute rheumatic fever and rheumatic heart disease. Clin Epidemiol 2011;3:67-84.
6. Lozano R, Naghavi M, Foreman K, Lim S, Shibuya K, Aboyans V, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet 2012;380(9859):2095-128.
7. Roberts K, Colquhoun S, Steer A, Reményi B, Carapetis J. Screening for rheumatic heart disease: current approaches and controversies. Nat Rev Cardiol 2013;10(1):49-58.
8. Meira ZM, Goulart EM, Colosimo EA, Mota CC. Long term follow up of rheumatic fever and predictors of severe rheumatic valvar disease in Brazilian children and adolescents. Heart 2005;91(8):1019-22.
9. Nemani L, Maddury J, Barik R, Arigondam AK. A Cross-sectional study to look at the determinants of poor adherence to secondary penicillin prophylaxis for rheumatic heart disease at a tertiary care center in South India. J Clin Prev Cardiol 2018;7(1):5-10.
10. Gasse B, Baroux N, Rouchon B, Meunier JM, De Frémicourt I, D'Ortenzio E. Determinants of poor adherence to secondary antibiotic prophylaxis for rheumatic fever recurrence on Lifou, New Caledonia: a retrospective cohort study. BMC Public Health 2013;13(1):131.
11. Remenyi B, Carapetis J, Wyber R, Taubert K, Mayosi BM. Position statement of the World Heart Federation on the prevention and control of rheumatic heart disease. Nat Rev Cardiol 2013;10(5):284-92.
12. Steer AC, Colquhoun S, Kado J, Carapetis JR. Secondary prophylaxis is important for the prevention

of recurrent rheumatic fever in the Pacific. Pediatr Cardiol 2011;32(6):864-5.

13. Steer AC, Carapetis JR. Prevention and treatment of rheumatic heart disease in the developing world. Nat Rev Cardiol 2009;6(11):689.
14. Musoke C, Mondo CK, Zhang W, Freers J, Okello E, Kakande B, et al. Benzathine penicillin adherence for secondary prophylaxis among patients affected with rheumatic heart disease attending Mulago Hospital: cardiovascular topics. Cardiovasc J Afr 2013;24(4):124-9.
15. Thompson SB, Brown CH, Edwards AM, Lindo JL. Low adherence to secondary prophylaxis among clients diagnosed with rheumatic fever, Jamaica. Pathog Glob Health 2014;108(5):229-34.