

Patterns of Valvular Involvement in Rheumatic Heart Disease patients taking Benzathine Penicillin at Shahid Gangalal National Heart Centre, Kathmandu, Nepal

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Abstract

Background and Aims: Acute rheumatic fever and rheumatic heart disease constitute an important public health problem in the developing countries. The disease results from an abnormal autoimmune response to a group A streptococcal infection in a susceptible host. We aim to describe the pattern of valvular involvement in patients taking Injection Benzathine Penicillin.

Methods: All the patients, who were taking injection Benzathine penicillin during 15th April to 14th July, 2013 at our Centre, were included in this study. Demographic features like age, sex, echocardiographic diagnosis along with any adverse effects of Benzathine penicillin were collected.

Results: A total of 661 patients were included in our study, out of which female predominated in numbers. Rheumatic heart disease rather than rheumatic fever was the cause for Penicillin injection. Mitral valve was the most common valve involved and it was more common in female. Pure mitral stenosis was the most common valvular involvement. Forty two percent patients underwent intervention; among them Percutaneous transluminal mitral commissurotomy was the most common. There was no adverse event during the study time following penicillin injection.

Conclusions: Women are more commonly affected than male. Mitral valve is the most common valve involved.

Keywords: Benzathine Penicillin, Rheumatic fever, Rheumatic Heart Disease, Valvular involvement

Introduction

Rheumatic fever (RF) and rheumatic heart disease (RHD) constitute important public health problem in the developing countries due to its high prevalence. RHD is a significant cause of morbidity and mortality among Nepalese school children.^{1,2} Its prevalence is high both in rural as well as in urban Nepal.³

The disease results from an abnormal autoimmune response to a group A streptococcal infection in a susceptible host. RF, the precursor to RHD, can affect different organs and lead to irreversible valve damage and heart failure.⁴ RHD occurs in 30-45% of the patients with RF and it leads to chronic valvular lesions.⁵ Injection Benzathine Penicillin is recommended for the primary and secondary prevention of the disease.

Our study was designed to describe the pattern of valvular involvement in patients taking Benzathine Penicillin.

Methods

It was a single centre prospective, cross sectional, descriptive study conducted for three months from 15th April to 14th July, 2013 in Shahid Gangalal National Heart centre (SGNHC), Kathmandu, Nepal. The study protocol was approved by the Ethics Committee of SGNHC. Informed consent was taken from all the patients. All the patients, who were prescribed with injection

Benzathine penicillin during the study period were included in this study. Demographic features like age, sex, echocardiographic findings (valvular involvement) along with any adverse effects of Benzathine penicillin were collected. Echocardiographic diagnosis of RHD was done according to World Heart Federation criteria for echocardiographic diagnosis of RHD- an evidence-based guideline.⁶ Statistical analysis was performed with SPSS 16.

Results

One thousand six hundred and eighty six Benzathine Penicillin injections were given to 661 patients. Age ranged from 4 years to 50 years, with the mean age 24.1±7.1 years. Out of 661 patients 391 (59.1%) were female and 270 (40.9%) were male with female to male ratio of 1.44:1. RF was the cause for penicillin injection in 78 (11.6%) patients. Five hundred and eighty three (88.4%) patients had valvular involvement. The number of female patients was much more than male taking Benzathine penicillin in RF and RHD patients as shown in table 1.

RF	78	11.6%
Male	36	46.7%
Female	42	53.3%
RHD	583	88.4%
Male	234	40.1%
Female	349	59.9%

Solitary valvular involvement of either mitral or aortic valve was present in 491 patients. Isolated mitral valve involvement (Mitral Stenosis (MS), Mitral regurgitation (MR) and MS with MR) was present in 448 patients whereas isolated Aortic valve involvement (Aortic stenosis (AS), Aortic regurgitation (AR) and AR with AS) was present in 43 patients. Lone MS (209 patients) is the most common valvular involvement followed by, Lone MR (201 patients), MS with MR in 38 patients and AR in 33 patients as shown in Table 2.

Mixed (Mitral as well as Aortic) valve involvement was present in 89 patients. Among mixed valvular involvement, MR with AR was the most common (59 patients) followed by AR with MS (14) and AS with MR in 10 patients. All types of valvular involvement (AR/AS/MR/MS) were a rare combination present in 2 patients as shown in table 2.

Valve	No	%
Mitral valve	448	76.8
MS	209	35.8
MR	201	34.5
MS with MR	38	6.5
Aortic Value	43	7.4
AS	5	0.8
AR	33	5.7
AS with AR	5	0.8
Mixed involvement	92	15.8
AR with MR	63	10.1
AR with MS	13	2.4
AS with MR	7	1.7
AS with MS	3	0.5
AR/AS/MR/MS	2	0.3
AR/MS/MR	4	0.6

Mitral valve disease was significantly more in female compared to male whereas Aortic valve involvement was significantly more common in Male patients.

Valve	Total	Male	Female	Male/Female ratio
Mitral valve	448	161	287	0.56
MS	209	71	138	0.51
MR	201	83	118	0.70
MS with MR	38	7	31	0.22
Aortic Valve	43	31	12	2.55
AS	5	5	0	5
AR	33	21	12	1.75
AS with AR	5	5	0	5
Mixed involvement	92	42	50	0.84
AR with MR	63	30	33	0.90
AR with MS	13	5	8	0.62
AS with MR	7	4	3	1.33
AS with MS	3	2	1	2
AR/AS/MR/MS	2	1	1	1
AR/MS/MR	4	0	4	

Discussion

In our study RHD is more common in female compared to male which are similar to other studies from the other developing countries,^{7,8,9} although a study in a western country showed both sexes are equally affected by RHD.¹⁰

In our study most of the patients were taking Penicillin for RHD (88.4%) compared to for RF (11.6%) which is similar to the study done by Humagain¹¹ et al.¹¹ The penicillin injection is provided free for the patient, compliance with the treatment is good.

Our study revealed that the Mitral valve is most commonly involved than the aortic valve which is similar to other studies.^{10,12,13} In our study MS is the most common lesion followed by MR this finding is similar to the results in others studies,^{14,15,16} but a study done by Humagain¹¹ et al and Shrestha¹⁷ et al showed MR as the common valvular involvement.

In our study AS was the least common similar to other studies.^{9,16,18} Our study revealed that mitral valve disease was more common in female than in male whereas aortic valve disease was more common in male than female. We found AS to be more common among males like the study Humagain¹¹ et al. however Shrestha N¹⁷ et al found AR to be more common among males.

Though adverse events in patients taking Injection Benzathine Penicillin are reported in other study, during our study period we didn't had any major adverse events.

Single centre study without the detail echocardiographic measurements and clinical evaluation are the limitation of this study.

Conclusions

Our study suggests that women are more commonly affected than male. Mitral valve is the most common valve involved in RHD.

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