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A study of spectrum of rheumatic heart disease in a tertiary care hospital in Central Nepal

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ABSTRACT

Background and aims: Rheumatic heart disease is one of the most common cause for heart failure and associated mortalities/morbidities in the young population in developing countries like Nepal imparting huge familial, social and manpower burden.

Materials and methods: This is a hospital based descriptive cross-sectional study during June 2014 to April 2016 over a period of 22 months at College of Medical Sciences-Bharatpur including 235 patients with clinical and/or echocardiographic evidence of definite rheumatic heart disease.

Results: The age of the patients ranged from 7 to 76 years with mean age 39.82 ± 4.2 years with female preponderance (F:M = 2.1:1) ($p < 0.01$). Majority of the rheumatic heart disease patients belonged to 30–44 years (28.78%) followed by 15–29 years (25.75%) and 45–59 years (25.00%). Majority belonged to the low socioeconomic status (60.60%) ($p < 0.05$). The predominantly involved isolated valve was mitral in 110 patients (46.80%) followed by isolated aortic valve in 22 patients (9.36%) and 79 (33.62%) had dual valvular involvement. The common rheumatic valvular lesions were pure mitral stenosis in 32 (13.61%), isolated mitral regurgitation in 58 (24.68%), combined mitral stenosis/regurgitation in 36 (15.32%), combined mitral/aortic regurgitation in 23 (9.78%) and combined aortic stenosis/regurgitation in 18 (7.66%) patients with few overlappings. The common complications encountered were heart failure in 90 (38.30%) and arrhythmias in 124 (51.00%) patients.130 patients (55.32%) received injectable benzathine penicillin whereas 45 patients (19.15%) preferred oral penicillin V. Surgical intervention was done in 54 (22.97%) patients. 12 (5.10%) expired in the CCU during the course of treatment.

Conclusion: RHD is a leading cause of heart failure among young populations with requirement of prolonged duration of medical treatment and many of them requiring surgery.

1. Background

Rheumatic heart disease (RHD) is one of the most common cardiac disease in developing countries like Nepal. According to the WHO, at least 15.6 million people worldwide have RHD. Of the 500,000 individuals who acquire acute rheumatic fever (ARF) every year, 300,000 go on to develop RHD and 233,000 deaths annually are attributable to ARF or RHD [1,2].

RHD leads to early onset of heart failure in the young population along with multiple complications with lots of mortalities and morbidities each year. It also imparts huge economic and social burden in the Nepalese communities.

We do not have adequate studies on the spectrum and related complications of RHD in central Nepal outside Kathmandu valley. This belt is located in the east–central part of the country covering many patients from nearby zones like Narayani, Lumbini, Gandaki and Janakpur. This study is carried out in our tertiary level hospital in central Nepal to study the magnitude of RHD in the overall cardiac outpatients and inpatients and the spectrum of cardiac involvement along with complications.

2. Aims and objectives

This study is designed to study the overall burden of RHD in the cardiology out and inpatients along with spectrum of cardiac involvement with special focus on pattern of valvular involvement. This study will give a real glimpse of burden of RHD in central Nepal.

3. Materials and methods

This is a hospital based cross-sectional study during June 2014 to April 2016 over a period of 22 months at College of Medical Sciences-Bharatpur including 235 patients with clinical and echocardiographic evidence of definite rheumatic heart disease.

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3.1. Inclusion criteria

Consecutive 235 patients with echocardiographic evidence of definite rheumatic heart disease were included in the present study.

2012 World Heart Federation criteria for the echocardiographic diagnosis of rheumatic heart disease was applied to reach the diagnosis [3].

3.2. Definite RHD (A, B, C, or D)

- A. Pathological MR and at least 2 morphological features of RHD of the MV
- B. MS mean gradient ≥4 mm Hg
- C. Pathological AR and at least 2 morphological features of RHD of the AV
- D. Borderline disease of both the AV and the MV

3.3. Borderline RHD (A, B, or C)

- A. At least 2 morphological features of RHD of the MV without pathological MR or MS
- B. Pathological MR
- C. Pathological AR

3.4. Criteria for pathological mitral regurgitation

(All 4 Doppler echocardiographic criteria must be met).

Seen in 2 views: In at least 1 view, jet length ≥2 cm, velocity ≥3 m/s for 1 complete envelope, pan-systolic jet in at least 1 envelope.

Morphological Features of RHD.

Features in Mitral Valve (MV): MV leaflet thickening ≥3 mm (age-specific), chordal thickening, restricted leaflet motion, excessive leaflet tip motion during systole.

3.5. Pathological aortic regurgitation

Seen in 2 views: In at least 1 view, jet length ≥1 cm, velocity ≥3 m/s in early diastole, pan-diastolic jet in at least 1 envelope.

Features in aortic valve (AV): Irregular or focal thickening, coaptation defect, restricted leaflet motion, prolapse.

3.6. Exclusion criteria

Those not fitting into the echocardiographic criteria for diagnosis of definite RHD were excluded from the study.

Verbal consent was taken from each patient during the study period.

Data was regularly entered into the SPSS-16 software.

3.7. Statistical analysis

The datas were analysed by the statistician. Number and sex distribution were expressed in mean and standard deviation. Crosstab analysis was done wherever required. *P* value of <0.05 was considered significant.

Data was collected from both cardiology outpatients and inpatients (admitted in cardioward/coronary care unit). Relevant data and information were entered into the pre-structured proforma and then analysed by SPSS-16 software.

Ethical clearance was taken from the Institutional review Board Committee of College of Medical Sciences-Bharatpur, Nepal.

4. Observations and results

Out of total 264 patients who were evaluated with 2-dimensional transthoracic echocardiography, 235 patients were categorized to be having definite RHD and 29 patients had possible or borderline RHD. Those with definite RHD were enrolled in our study for further statistical analysis.

The age of the patients ranged from 7 to 76 years with mean age 39.82 ± 4.2 years with female preponderance (F:M = 2.1:1) ($p < 0.01$).

The majority of the RHD patients belonged to 30–44 years (29.36%) followed by 15–29 years (26.38%) and 45–59 years (25.53%) as shown below in the Fig. 1 highlighting the involvement of productive age group.

Geographical distribution: The majority of the patients in this study were from Chitwan district (86–36.59%) followed by Nawalparasi (56–23.83%), Makwanpur (26–11.06%), Gorkha (14–5.96%), Tanahun (10–4.25%), Lamjung (8–3.40%) and few from India (10–4.25%).

Majority belonged to low socioeconomic status (63.83%) ($p < 0.05$). 81 (34.47%) had middle SES and only 4 (1.70%) had good SES.

History of acute rheumatic fever was elicited only in 16 patients (6.80%).

Overcrowding (family members >6) was noticed in 140 patients (59.57%) ($P < 0.01$).

22 patients (9.36%) were pregnant all of whom had uneventful antenatal and postnatal history.

Isolated mitral valve was the most commonly affected valve in our study (46.80%) followed by isolated aortic valve. 33.62% had dual involvement of mitral and aortic valve. Only 7.66% had involvement of

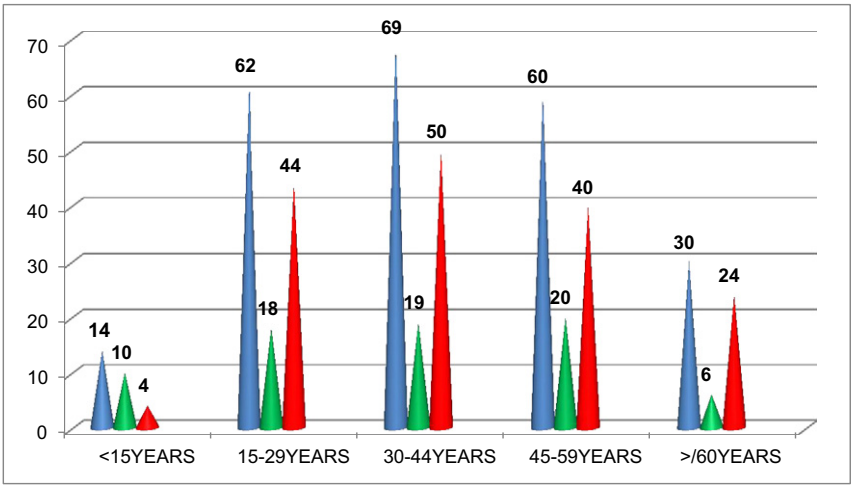

Fig. 1. RHD distribution with respect to age and sex (n-235). Note: Blue colour represents total number; green represents males and red represents females.