

# A Clinical Study of Congestive Cardiac Failure In Rheumatic Heart Disease

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## Abstract

**Introduction:** Congestive cardiac failure is the failure of the heart to pump blood at a rate commensurate with the requirements of the metabolizing tissue and or its ability to do so requires an abnormally elevated pressure. CCF once sets in, pressure with malignant progression with one year mortality of 38% and 15% and six year mortality of 80% and 65% in men and women respectively. Acute rheumatic fever (ARF) and its sequel Rheumatic Heart Disease (RHD) may impair myocardial function to precipitate failure.

**Aim:** To study clinical features of Congestive Cardiac Failure in Rheumatic Heart Disease.

**Methods:** A prospective study with 50 patients admitted between August 2006 and September 2008 in Shree Birendra Hospital formed the subject of this study.

Patients of rheumatic valvular heart disease of both sexes in congestive cardiac failure at the time of admission or who developed failure during hospitalization were taken into the study. Detailed history was taken from all patients. Detailed examination was done in all patients with emphasis in cardiovascular and relevant system. Modified Framingham heart study criteria was used for the diagnosis of CCF.

**Results:** A total of 50 patients with RHD in CCF were the subject of study. The average age was 33.78 years. The presenting clinical features of the patients were breathlessness on exertion and it was the commonest presenting complaint and was present in all patients. Palpitation was present 37 of 50 patients (74%). Basal crepitation was the commonest clinical sign present and 29 of 50 patients (58%) had the raised jugular venous pressure. Mitral valve was the commonest valve involved (with/ without other valves) and was seen in 94% (47) patients.

**Key words:** Congestive Cardiac Failure, Rheumatic Heart Disease

## Introduction

Congestive cardiac failure (CCF) is defined as the failure of the heart to pump blood at a rate commensurate with the requirements of the metabolizing tissue and or its ability to do so requires an abnormally elevated pressure<sup>1</sup>.

CCF once sets in, pressure with malignant progression with one year mortality of 38% and 15% and six year mortality of 80% and 65% in men and women respectively<sup>2,3</sup>. Pharmacotherapy only blunts the progression of CCF and increases the longevity, it does not eliminate the end point, so that patients with CCF despite optimum pharmacotherapy succumb to it after a lapse of months to years. Acute rheumatic fever (ARF) and its sequel Rheumatic Heart Disease (RHD) may

impair myocardial function to precipitate failure.

Currently, the only way to prevent first attacks of rheumatic fever is to appropriately treat the previous episodes of streptococcal pharyngitis, as it is impossible to identify persons at risk for developing rheumatic fever after an episode of streptococcal pharyngitis<sup>4</sup>.

In a resource poor country like Nepal, where predisposing factors to rheumatic fever persists and prophylactic penicillin therapy is often inadequate, acute rheumatic carditis still frequently follows a fulminant course resulting in death or severe disability at an early age<sup>5</sup>.

A substantial number of patients of RHD presenting at hospital are failure and this remains the important cause of death in such patients<sup>6</sup>.

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## Methods

A total number of 50 patients admitted between August 2006 and September 2008 in Shree Birendra Hospital formed the subject of this study. Patients of rheumatic valvular heart disease of both sexes in congestive cardiac failure at the time of admission or who developed failure during hospitalization were taken into the study.

Detailed history was taken from all patients which included:

Past history of rheumatic fever, any recent changes in physical activity, details of drug intake including rheumatic prophylaxis and previous hospitalization. Detailed examination was done in all patients with emphasis in cardiovascular and relevant system. Precipitating factor was looked for in all patients.

All patients were subjected to:

1. Routine haematological examination to look for anaemia raised erythrocyte sedimentation rate (ESR) and evidence of infection.
2. Urine routine examination for evidence of infection, microscopic haematuria.
3. Chest X-ray to look for cardiomegaly, prominence of pulmonary arteries, dilatations of upper lobe pulmonary veins and infective focus.
4. Twelve lead electrocardiogram for evidence of chamber enlargement, axis, arrhythmia and to exclude other diagnosis.
5. Echocardiogram
6. Throat Swab Culture
7. ASO titre
8. C- Reactive protein
9. In suspected cases of infective endocarditis, blood culture was done by obtaining three samples at one hourly interval, under strict aseptic precaution

## Diagnosis:

Modified Framingham heart study criteria was used for the diagnosis of CCF. The presence of 3 or more of

these criteria was required to make diagnosis of CCF.

The severity of CCF was assessed by the New York Heart Association criteria (NYHA).

## Assessment

Patient was considered to be anemic if Hb was <10 gm/dl. A haemoglobin level of 10-11 gm/dl has been defined as anemia and a level below 10 gm/dl as marked anemia. Chest infection was based on chest X-ray and / or isolation of organism in sputum. Infective endocarditis as the precipitating factor was based on clinical features and vegetation seen on echocardiography.

The various parameters observed were noted, tabulated and statistically analyzed using SPSS version 10.0. and Chi Square test was applied to Correlating severity.

## Results

A total of 50 patients with RHD in CCF were the subject of study.

### Age distribution

Patients age ranged from 13 to 70 years. Most of the subjects of present study were between 21 and 30 years(30%). The average age was 33.78 years.

### Sex distribution

The sex distribution of patients in the present study was 1:1.27 (Male to female ratio)

### Mode of Presentation (Table 1)

The presenting clinical features of the patients were breathlessness on exertion was the commonest presenting complaint and was present in all patients. Palpitation was present 37 of 50 patients(74%). Basal crepitation was the commonest clinical sign present and 29 of 50 patients(58%) had the raised jugular venous pressure.

Severity of CCF was classified by NYHA. A total of 27(54%) patients Class III, 22(44%) were in class II and only 1 patient was in class IV. Thirty four patients (68%) gave passed history suggestive of RF.

**Table 1.** Clinical features of 50 RHD patients in CCF

Clinical features	Total No.	Percentage
<b>Symptoms</b>		
Breathlessness on exertion	50	100
Chest pain	21	42
Palpitation	37	74
Paroxysmal nocturnal dyspnoea	20	40
orthopnea	13	26
Cough with / without expectoration	17	34
<b>Signs</b>		
Raised jugular venous pressure	29	58
Hepatojugular reflux	9	18
Basal crepitations	50	100
S3 gallop	11	22

**Valvular Lesion**

The various valvular lesions detected in patients studied are as depicted in table 2

**Table 2:** Valvular lesions

Valve involvement	Male	Female	Total
Mitral	18	29	47(94)
Stenosis	06	11	17(34)
Regurgitation		01	01(02)
Both	02	06	08(16)
Aortic	10	04	14(28)
Stenosis	-	-	-(-)
Regurgitation	03	-	03(06)
Both	-	-	-(-)
Triscupid	03	07	10(20)
Stenosis	-	-	-(-)
Regurgitation	-	-	-(-)
Both	-	-	-(-)
Pulmonary	-	-	-(-)

Mitral valve was the commonest valve involved (with/ without other valves) and was seen in 94% (47) patients. Isolated mitral valve involvement was seen in 52% (26) patients. Of these isolated mitral stenosis was present in 34% (17) patients.

Isolated mitral regurgitation was seen in only one patient (2%) and combination of mitral stenosis and regurgitation in 08 patient (16%)

Aortic valve involvement was seen in 28% (14 patients) with isolated aortic regurgitation in 06% of cases while the other lesions were in combinations . Isolated aortic stenosis was not seen. Tricuspid valve involvement was seen in 20% of cases, only in combination with mitral valve lesion. No pulmonary valve effection was noted. Mitral and Tricuspid valvular lesion was seen more in females 58% and 14% respectively while aortic valve involvement was found more in female 20%

### Electrocardiogram(ECG)

Most common abnormality in ECG in both NYHA class II patients were left atrial enlargement(LAE) seen in 77.3% and 70% of patients respectively. Atrial fibrillation (AF) was seen in 20% cases. Prolongation of P-R interval was not noticed in any of the patients.

### Discussion

Congestive cardiac failure is major and growing public health problem. Its prevalence is 3 to 20 per 1000 and increases steeply with age. Survival at five years after the onset of heart failure in Framingham study was 25% in men and 38% in women. The mortality rate of heart failure was 6 to 7 times that of general population<sup>7</sup>.

In spite of pharmacological progress, end stage CHF is still associated with decrease in quality of life. Heart transplantation remains the last therapeutical option for these patients. While the one year survival rate has increased over the last few years upto 80% but a major problem remains the significant lack of donors<sup>8</sup>. In the present study, precipitating factor in rheumatic valvular heart disease as a cause of cardiac decompensation was studied.

Majorities of patients were in their third decade (30%). This is compatible with other studies where 33.8% and 36% of the cases fell in the same age group<sup>6,9</sup>. However in other studies, majority of patients have been noted in the second decade<sup>10,11,12,13</sup>.

The male to female ratio was 1:1:27 in the present study. This observation is in agreement with other studies where the male to female ratio was 1:1:7 respectively and 1:1:17 respectively<sup>10,14</sup>.

Breathlessness on exertion was the most common symptom that the patient presented with in this study(100%). The presenting symptom was breathlessness in more than 735 of patients<sup>6,12,15</sup>.

Past history of Rheumatic fever was obtained in 68% of the patients, which is in agreement with a figure of 66% observed by Roy SB et al<sup>15</sup>. However a lower incidence has been recorded by Subramaniam et al (30%) and Raja Ram C et al (49.3%) respectively<sup>13,14</sup>.

### Valvular lesions

Mitral valve was the commonest valve involved (94%) with isolated mitral stenosis being the most common single valvular lesion(34%). This figure is in concordance with the findings of other workers where isolated mitral stenosis was found to be 40%, 38% and 35% respectively<sup>5,13,15</sup>. However in studies by other workers, the finding of such a lesion was in the range of 43% to 98.4%<sup>6,10,11,12,14</sup>.

Isolated mitral regurgitation was found in only one patient in the present study(2%). This differs from the work of Marcus et al and Arora et al , where mitral regurgitation was found in 41% and 315 of patients respectively<sup>5,10</sup>. This difference could be due to a small sample size in the present study as compared to those of above Sanyal et al in their study observed, mitral regurgitation as the single most common valvular lesion comparing 91% of the cases<sup>16</sup>.

Combined mitral stenosis with regurgitation was seen in 16% of cases which is consistent with Arora et al and Raja Ram et al who found similar lesion in 22.7% and 14% respectively<sup>10,14</sup>. This figure however differs from those of Marcus et al, Roy et al and Agrawal et al who observed the combination of mitral stenosis and regurgitation in 31%, 63% and 26% respectively<sup>5,12,15</sup>. This difference in observation was probably due to a large sample size in the first two studies and juvenile age group in the last study.

Aortic valve involvement was seen in 285 of the patients out of which 22% were in combination with mitral valve which is in agreement with finding of other workers where aortic and mitral involvement was found to be 15.8% and 24% respectively<sup>12,13</sup>.

None of the patient had aortic stenosis, isolated tricuspid and pulmonary valve involvement which is consistent with the findings of Sanyal where no patient had aortic stenosis or involvement of pulmonary and tricuspid valve<sup>16</sup>.

## Conclusion

It was seen that there was no statistical significance in the severity of CCF when patients belonging to two NYHA. Classes were correlated on the basis of electrocardiogram, chest X-ray and echocardiogram. This indicates that the patient's NYHA functional status was independent of the abnormalities recorded on relevant investigation. Hence it can be concluded that the severity can be probably related to the severity of specific underlying precipitating factor.

RHD is a disease of developing countries. While compliance with chemoprophylaxis can be upto 100% in closed or captive population, considerable variations are possible in compliance.

To avoid poor compliance with oral antibiotic regime, a single injection of Benzathine –penicilline G can be selected as the standard mode of therapy for all children with symptoms and signs suggestive of streptococcal pharyngitis<sup>4</sup>.

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