



## HEART FAILURE; FREQUENCY OF DIFFERENT FACTORS CAUSING DECOMPENSATION IN PREVIOUSLY COMPENSATED HEART FAILURE.

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**ABSTRACT... Objectives:** To identify factors which cause deterioration with worsening of symptoms in previously stable heart failure patients. **Study design:** Descriptive case series **Setting:** Gulab Devi Chest Hospital, Lahore. **Duration:** 01-04-2017 to 30-09-2017. **Patients and Methods:** The study was done on 100 patients diagnosed with LV systolic dysfunction or cardiomyopathy with LVEF<40%. Patients were examined regarding clinical signs of decompensation and detailed history was taken to probe the cause of decompensation. All information was noted down on a pre-defined questionnaire. Mean  $\pm$  S.D was applied for quantitative data like age and LVEF. Frequency (%) was used for qualitative data like gender. **Results:** Non compliance to drugs was the most common cause of decompensation (56%), amongst them 73.21% cases were noncompliant due to poor awareness about the importance of continuing use of medicines. Infection was the second common precipitating factor (51%), where chest infection was the most common cause in 74.51% cases. Other causes of decompensation were ischaemia (28%), renal impairment (36%), and arrhythmias (23%) while more than one precipitating factors were found in 41% of cases. **Conclusion:** Multiple factors can trigger deterioration in patients with previously stable heart failure. Recognition of these factors is important for good long term outcome in these patients.

**Key words:** Decompensated Cardiac Failure, Cardiomyopathy, Left Ventricular Systolic Dysfunction, Non Compliance.

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## INTRODUCTION

Heart failure is characterized by reduced pumping ability of heart mainly due to myocardial dysfunction.<sup>1</sup> Common symptoms of heart failure include shortness of breath which may become worse on exertion, excessive tiredness and sometimes leg swelling.<sup>2</sup> If not treated properly heart failure causes significant morbidity and mortality.<sup>3</sup> Heart failure is a common condition. In developed countries around 2% of adults have heart failure while this number increases to 6–10% in adults aged more than 65 years.<sup>4,5</sup>

Heart failure may be with reduced ejection fraction (Usually defined as LVEF < 50%) or with preserved ejection fraction (LVEF >50%). Common causes of heart failure with reduced EF (LV systolic dysfunction) are ischaemic heart disease, idiopathic cardiomyopathy, uncontrolled hypertension, valvular heart diseases and

diabetes mellitus. Heart failure due to ischemic heart disease is caused by acute ischemic events or by chronic ischemic damage.<sup>6</sup>

Chronic stable heart failure may become decompensated requiring hospitalization. Readmission rates is high within few months of previous hospitalization reaching up to 25% within six months after a previous hospital discharge especially in patients older than 65 years.<sup>7,8</sup> Common causes of heart failure decompensation include an inter current illness (such as pneumonia), myocardial ischaemia, patient's noncompliance to drugs, cardiac arrhythmias and uncontrolled hypertension.<sup>9</sup> Other less common causes include anemia, excessive fluid or salt intake, and some medications that causes fluid retention such as NSAIDs and Glitazones.<sup>10</sup> NSAIDs when taken on long term basis increase the risk twofold.<sup>11</sup> One or more exacerbating

factors contributing to HF hospitalization is usually identified in most patients admitted to the hospital for HF as shown in OPTIMIZE-HF study.<sup>12</sup>

Detection of precipitating factors followed by appropriate treatment measures is important for proper management of acute decompensated HF. Guidelines also suggest that patients hospitalized for HF should undergo thorough evaluation for precipitating factors.<sup>13</sup> The goals of treatment in these patients are not only to reduce mortality but at the same time to reduce morbidity with reduction of symptoms, allowing for greater physical activity and subsequently prevention of acute decompensation.

## MATERIALS AND METHODS

### Design and Setting

This descriptive case series was done in cardiology complex of Gulab Devi Chest Hospital, Lahore within the period of Six months.

### Sample Selection

Using Non probability (purposive) sampling, 100 diagnosed cases of LV systolic dysfunction or cardiomyopathy with LVEF<40% who were previously asymptomatic or having minimal symptoms during exertion and later on presented with dyspnea at rest or with minimal exertion, were enrolled in this study. Patients with valvular heart diseases, patients with right sided cardiomyopathy and those with diastolic heart failure were excluded.

### Patients and Methods

100 cases with Cardiomyopathy or LV systolic dysfunction admitted with acute decompensated condition in cardiac complex of Gulab Devi Hospital and meeting the inclusion criteria were included in the study. Informed consent was taken from all patients. The diagnosis of acute decompensation with pulmonary oedema was largely based on clinical findings, arterial blood gas analysis and where deemed appropriate by chest X-ray. Non-compliance with medications was mostly assessed from patient's prescription records and discussion with family members whenever considered appropriate. Myocardial ischemia was diagnosed either by ST or T wave

changes on ECG or by increased levels of cardiac enzymes, regardless of the presence or absence of chest pain. Renal impairment was defined as increase of more than 25% creatinine from baseline if known or absolute creatinine value more than 2.0 mg/dl. Infection was defined by presence of fever (Temp >99F) along with raised Leucocytes count. Arrhythmias were considered only if any episode of tachy or brady arrhythmia was recorded by cardiac monitoring or on holter recording. SPSS version 22 was used for data collection and data analysis. Mean  $\pm$  S.D was applied for quantitative data like age and LVEF. Frequency (%) was used for qualitative data.

## RESULTS

The mean age of cases was  $48.99 \pm 16.76$  years. There were 66(66%) male and 34(34%) female cases. The mean LVEF was  $33.21 \pm 7.76$  (%). According to cardiac disease 32(32%) cases had DCMP, 36(36%) cases had ICMP and 32(32%) cases had severe LV systolic dysfunction. There were 56(56%) cases who had non-compliance in which 15(26.79%) cases had non-compliance due to financial issues and 41(73.21%) cases had due to lack of awareness. Infection was seen in 51(51%) of the cases in which 38(74.51%) had chest infection, 12(23.53%) had UTI and 1(1.96%) cases had infection on other sites. Ischemia was diagnosed in 28(28%) of the cases in which 21(75%) had changes in ECG and 7(25%) had raised cardiac enzymes. A total of 36% cases had renal impairment and 23% cases had arrhythmias in which 3(13.04%) had Ventricular tachycardia, 18(78.26%) had Atrial fibrillation, 1(4.35%) had Brady arrhythmias and 1(4.35%) had other types of Arrhythmias. Forty one patients (41%) had more than one factors as the cause of heart failure decompensation.

	Age (years)	LVEF (%)
Mean	48.99	33.21
S.D	16.76	7.76
Range	73	35
Minimum	17	15
Maximum	90	50

Table-I. Descriptive statistics of age (Years) and LVEF %

		Frequency	Percent
Gender (n=100)	Male	66	66.0
	Female	34	34.0
Cardiac disease (n=100)	DCMP	32	32.0
	ICMP	36	36.0
	Severe LV systolic dysfunction	32	32.0
Non-compliance (n=100)	Yes	56	56.0
	No	44	44.0
Reasons of non-compliance (n=56)	Due to financial issues	15	26.79
	Due to lack of awareness	41	73.21
Infection(n=100)	Yes	51	51.0
	No	49	49.0
Site of infection (n=51)	Chest infection	38	74.51
	UTI	12	23.53
	Other	1	1.96
Ischemia (n=100)	Yes	28	28.0
	No	72	72.0
Diagnosis of Ischemia (n=28)	ECG changes	21	75.0
	Positive cardiac enzymes	7	25.0
Renal impairment (n=100)	Yes	36	36.0
	No	64	64.0
Arrhythmias (n=100)	Yes	23	23.0
	No	77	77.0
Types of arrhythmias (n=23)	Ventricular tachycardia	3	13.04
	Atrial fibrillation	18	78.26
	Brady arrhythmias	1	4.35
Infection + Ischemia + Renal impairment + Arrhythmias		2	2%
Infection + Ischemia+ Renal impairment		2	2%
Infection + Ischemia + Arrhythmias		2	2%
Infection + Renal impairment + Arrhythmias		2	2%
Infection + Ischemia		7	7%
Infection + Renal impairment		10	10%
Infection + Arrhythmias		6	6%
Ischemia + Renal impairment		3	3%
Ischemia + Arrhythmias		2	2%
Renal impairment + Arrhythmias		5	5%

Table-II. Frequency table of difference categorical variables

## DISCUSSION

CHF is clinically characterized by periods of remission and exacerbation. Although deteriorating ventricular function with worsening of symptoms may also require hospitalization, until so far the most common identified etiology is the presence of one or more precipitating factors causing acute decompensation in these patients requiring hospital admission.<sup>14</sup> These may include certain medical factors (e.g., infection, active ischemic event, deteriorating renal function or arrhythmias). In addition many

environmental, social and behavioral factors (e.g., non compliance with drugs, diet, inadequate patient education and failing social support) have also been implicated as the cause of acute decompensation.

The frequency of precipitating factors for heart failure differ from country to country. Our study shows extremely high rate of noncompliance in our patients (56%) which is predominately due to poor understanding regarding disease process and continuing use of medicines. This is alarming

as noncompliance to drugs was seen in only 8.9% in US population as demonstrated in OPTIMIZE-HF study<sup>12</sup> and in 15% patients in another study by Chin et al.<sup>16</sup> The other salient feature in our study is the presence of at least one precipitating factor in all patients in contrast to OPTIMIZE-HF where at least one precipitating factor was identified in 61.3% of patients.

A study by O Erk et al showed precipitating factors in systolic heart failure as infections (38%), arrhythmias (35%), and vascular causes (24%).<sup>15</sup> A single-center study among 435 patients hospitalized for HF showed commonly identified factors for HF exacerbations leading to hospitalization were acute ischemic event in 33% of patients, respiratory tract infection in 16%, uncontrolled hypertension in 15%, and non adherence to medicines in 15%.<sup>16</sup>

Understanding of these precipitating factors is very important because it helps practitioners to devise an appropriate plan. In case of noncompliance formal discussion sessions involving patient and family members may help to improve compliance. Readmission rate secondary to infection have been found to be reduced in elderly heart failure patients receiving pneumococcal vaccine emphasizing the need to consider for pneumococcal vaccination in these patients.<sup>17</sup> The annual mortality risk of heart failure after acute ischemic event is quite high: approximately 10% for females and 13% for males<sup>6,18</sup> necessitating the need to consider for coronary revascularization in eligible patients.<sup>18</sup>

## CONCLUSION

Noncompliance to drugs due to lack of awareness regarding importance of regular use of medicines followed by infections, ischaemia, renal impairment and arrhythmias are the leading factors for repeated hospitalization in patients with heart failure causing significant morbidity. Appropriate patient education for good compliance and to seek medical attention in case of any infection, chest pain etc. will be the cornerstone steps to achieve good long term outcome in these patients.

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

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*Understanding the Misunderstanding  
is the best understanding ever.*

– Unknown –

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#### AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Muhammad Ijaz Bhatti	Concept, article writing.	
2	Majid Kaleem	Concept, data collection.	
3	Asif Hanif	Data analysis.	