The Professional Medical Journal
www.theprofesional.com

DOI: 10.17957/TPMJ/16.3490

ORIGINAL PROF-3490

ACUTE HEART FAILURE PATIENTS;
CLINICAL PROFILE

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Article received on:
15/06/2016
Accepted for publication:
15/08/2016
Received after proof reading:
07/10/2016

ABSTRACT… Objectives: The objective of the study is to identify the precipitating factors among the patients presenting with AHF (Acute Heart Failure). **Study Design:** Cross sectional study. **Setting:** Punjab Institute of Cardiology, Lahore. **Duration of Study:** 6 months. From 01-01-2007 to 30-06-2007. **Methodology:** The calculated sample size was 170 cases with 5% margin of error, 95% confidence level taking expected percentage of uncontrolled hypertension i.e. 12% (least percentage among all precipitating factors). **Results:** In the study group, mostly patients of AHF were young with mean age of 55 $\pm$ 6.99 years, male (61.8%), Diabetic (53.5%) and have history of chronic Heart Failure (63.5%). In male the most common precipitating factor of AHF was ACS (39.04%) while in female uncontrolled hypertension (38.46%). **Conclusion**: In diabetic patients the most common precipitating factor of AHF was ACS (30.7%). In patients with acute decompensation of chronic heart failure the most common precipitating factor was non-compliance of medication (30.55%) while in patients with de novo Acute Heart Failure it was ACS (41.93%). ACS was the common precipitating factor of Acute Heart Failure (28.2%) among the study group irrespective of gender, diabetes and history of Heart Failure.

Key words: Precipitating factor, Heart failure, Diabetes, Hypertension.

Article Citation: Asghar N, Ahmad S, Nazim M, Ilyas HMF, Ahmad MN. Acute heart failure patients; clinical profile. Professional Med J 2016;23(10):1281-1287. **DOI:** 10.17957/TPMJ/16.3490

INTRODUCTION

Heart failure (HF) is a clinical set of signs and symptoms in which the heart fails to cope with the requirement of the body. Acute heart failure (AHF) represents an acute medical problem which needs prompt and methodical treatment approach for fruitful results. Patients presenting with AHF may be classified into two categories for clinical management purpose.[1] These categories are, new onset heart failure and acute decompensation of chronic HF.[2]

Universally, there is increasing burden of heart failure patients on the healthcare budget. In the U.S. alone, >6 million individuals are affected with above said disease, with 550,000 new cases added up yearly.[3] Similar epidemiology has been reported in journals in Europe, and in developing countries so far.[4,5] In a survey about heart failure patients, 4.6% of hospitalization in women and 5.1% in men, were due to HF which is considered alarming now a days.[6] The aging of the present population despite of improvements in treatment options of IHD is also the cause.[7]

We take heart failure as early to diagnose and treat in emergency ward on priority basis.[8] A better understanding mechanisms involved for decompensation help prevent mortality in acute settings.[9] We know how medical management improve the patients uotcome.[10] We have evolved new management strategies. Coronary artery intervention era is ahead with much positive role of primary PCI at many cardiac care centers. The most diagnosed causes of heart diseases include IHD and rheumatic heart diseases. The new generation antibiotics and its early use in sore throat has decreased incidence of rheumatic heart diseases. There is less information about precipitating factors.[11]

We are defining the precipitating factors correctly. This will help patient care in the better way. The factors of AHF have two categories. One is non-

modifiable. Second is avoidable. First includes, geographic variation, age, sex and family history etc. The second includes uncontrolled hypertension, anemia, infections, arrhythmias, ischemia, smoking and drug non-compliance etc. Both groups have their own importance that why we focus for management.[12]

The geographic distribution matters a lot. The aim of this study is to identify precipitating factors especially the preventable ones, leading to AHF in our community in Pakistan. Preventing the precipitants factors will help to reduce re-admissions as well as mortality and morbidity of HF.

OPERATIONAL DEFINITIONS

Acute Heart Failure

AHF is characterized by the clinical features of dyspnoea, crepitations and chest x-ray which shows features of pulmonary oedema, which are septal or kerley B lines, reticular shadowing of alveolar oedema, prominence of upper lobe vessels, enlarged hilar vessels or enlarged cardiac silhouette.

PRECIPITATING FACTORS

Following precipitating factors were enquired about at the time of presentation.

1. Acute Coronary Syndrome

Patients with chest pain or new ECG changes suggestive of ACS or both at presentation along with features of AHF.

A. Patients with myocardial infarction had chest pain with ST segment elevation on ECG or new onset of left bundle branch block and raised serum Troponin T level (> 0.2micro g/L) .
B. Patients with non ST elevation myocardial infarction had chest pain with ST segment depression or T wave inversion on ECG and raised serum Troponin T level (> 0.2micro g/L).
C. Patients with unstable angina had chest pain with ST segment depression or T wave inversion on ECG and normal serum Troponin T level (normal level equal or less than 0.2micro g/L).

Patients with theses presentations labeled as acute coronary syndrome.

2. Non-Compliance of Drugs

Patients taking already prescribed drugs for HF, hypertension, IHD and valvular heart disease either intermittently or not taking at all for at least one week. Patients labeled as non-compliant if any one of two mentioned features was present.

3. Infections

Patients with respiratory tract infections suggested by clinical features which may include fever, productive cough and raised white blood cell count (> 4-11 x 109 / L) especially the neutrophilic leucocytosis (>75%).

4. Uncontrolled Hypertension

Patients with blood pressure > 180/100 mmHg at presentation with or without any therapy.

5. Anemia

Patients with Haemoglobin < 10 g/dl at presentation.

6. Arrhythmias

Patients with tachyarrhythmias, either atrial or ventricular documented on ECG with heart rate > 100/min or bradyarrhythmias which include 3rd degree AV block with heart rate < 60/min.

MATERIAL AND METHOD

Sample Size

The calculated sample size is 170 cases with 5% margin of error, 95% confidence level taking expected percentage of uncontrolled hypertension i.e. 12% (least percentage among all precipitating factors).

Sampling Technique

Non-probability: Purposive sampling.

SAMPLE SELECTION

Inclusion Criteria

1. Any patient with AHF as mentioned in operational definition.
2. Patients of 18 years of age or above and of either sex.

3. Both diabetic and non-diabetics included.
4. Patients with or with history of congestive cardiac failure included.

Exclusion Criteria

Following patients were excluded from study:

1. Patients with renal disease or serum creatinine > 2 mg/ dl at presentation
2. Patients with any other co-morbid medical illness e.g. respiratory disease, liver disease, malignancy, septicaemia, psycharitic illness etc.

Data Collection Procedure

Cases selected in the emergency department. All patients explained the purpose and procedure of study and any risk involved addressed in emergency department. Informed consent taken. Patients evaluated for enrollment in the study according to inclusion and exclusion criteria. History of chest pain, fever, productive cough. Compliance with drugs, diabetes mellitus, chronic HF and blood pressure noted. Investigations including ECG and serum Troponin T (normal 0.2micro g/L) for ACS, complete blood count (normal 4-11 x 109 / L with neutrophils 40-75%) for respiratory tract infection, Haemoglobin level for anemia (Haemoglobin level men: 13-18 g/dl women: 11.5-16g/dl) and ECG for arrhythmias done in emergency department.

Data Analysis Procedure

The data analysis done on computer-based using SPSS ver.10. Descriptive statistics calculated. The age presented as Mean±SD. The categorical variables which include gender, history of HF, ACS, non-compliance with drugs, infections, uncontrolled hypertension, anemia, and arrhythmias presented as frequencies and percentages. Since it was a descriptive study so no test of significance applied.

RESULTS

In the study group, patients presenting with AHF were young as compared to international studies with mean age of 55 ± 6.99 years vs 69 ± 12 years. Majority of the patients of AHF were male (61.8%), Diabetic (53.5%) and had history of chronic HF (63.5%). In male the most common precipitating factor of AHF was ACS (39.04%) while in female it was uncontrolled hypertension (38.46%). In diabetic patients the most common precipitating factor of AHF was ACS (30.7%). In patients with ADCHF the most common precipitating factor of AHF was noncompliance of medication (30.55%) while in patients without history of chronic HF (de novo AHF) it was ACS (41.93%). ACS was the common precipitating factor of AHF (28.2%) among the study group irrespective of gender, diabetes and history of HF.

Table-I presents the baseline characteristic of patients of AHF including age, sex, history of diabetes mellitus and history of chronic heart failure.

Baseline Characteristics of Patients Presentating With AHF

Baseline Characteristics		Frequency	Percent
Age	30-50 years	40	23.5
	51-60 years	88	51.8
	61-80 years	42	24.7
Sex	Male	105	61.8
	Female	65	38.2
History of Diabetes Mellitus		91	53.5
History of Heart Failure		108	63.5

Table-I. Baseline characteristic of the patients.

Table-II shows the frequency and percentage of precipitating factors of AHF in male patients.

Precipitating factors of AHF In male patients

Precipitating Factors	Frequency	Percent
Acute Coronary Syndrome	41	39.04
Non-Compliance With Drugs	23	21.90
Arrhythmias	21	20
Uncontrolled Hypertension	15	14.28
Infections	4	3.8
Anemia	1	0.95
Total	105	100

Table-II. Precipitating factors of acute heart failure in male patients

Table-III shows the frequency and percentage of precipitating factors of AHF in female patients.

Precipitating factors of AHF In female patients		
Precipitating Factors	**Frequency**	**Percent**
Uncontrolled Hypertension	25	38.46
Non-Compliance With Drugs	11	16.92
Infections	9	13.84
Arrhythmias	9	13.84
Acute Coronary Syndrome	7	10.76
Anemia	4	6.15
Total	65	100

Table-III. Precipitating factors of acute heart failure in female patients.

Figure-1 shows the comparison of precipitating factors of AHF based on gender.

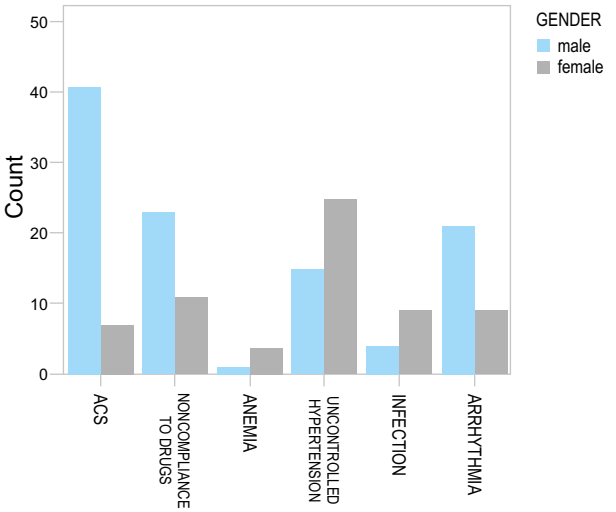

Figure-1. Comparison of distribution of the precipitating factors of AHF according to gender.

Table-IV shows the frequency and percentage of precipitating factors of AHF in diabetic patients.

Precipitating Factors of AHF In Patients With History of Diabetes Mellitus		
Precipitating Factors	**Frequency**	**Percent**
Acute Coronary Syndrome	28	30.7
Uncontrolled Hypertension	21	23.07
Non-Compliance With Drugs	18	19.7
Arrhythmias	17	18.6
Infections	6	6.5
Anemia	1	1.09
Total	91	100

Table-IV. Precipitating factors of acute heart failure in Diabetic patients.

Figure-2 shows the comparison of precipitating factors of AHF in diabetic patients with non-diabetic patients.

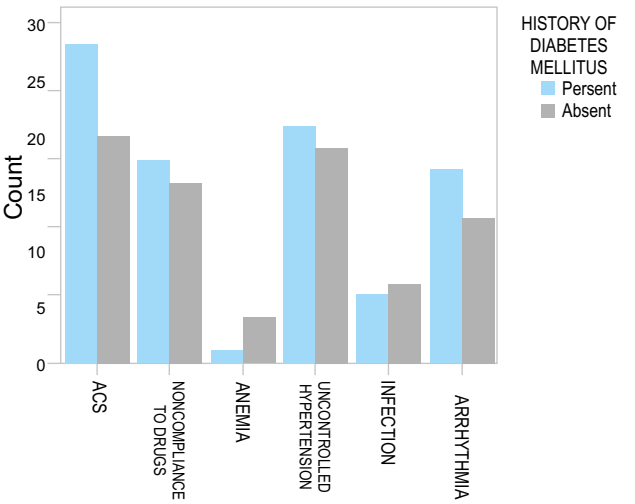

Figure-2. Comparison of distribution of the precipitating factors of AHF of diabetic with non-diabetic patients of acute heart failure.

Table-V shows the frequency and percentage of precipitating factors in patients with ADCHF.

Precipitating Factors of AHF in Patients with History of Pre-Existing Heart Failure		
Precipitating Factors	**Frequency**	**Percent**
Non-Compliance With Drugs	33	30.55
Arrhythmias	25	23.14
Acute Coronary Syndrome	22	20.37
Uncontrolled Hypertension	16	14.81
Infections	8	7.40
Anemia	4	3.70
Total	108	100

Table-V. The precipitating factors of acute decompensation of chronic heart failure.

Table-VI shows the frequency and percentage of precipitating factors of AHF in patients without history of chronic heart failure (de novo AHF). Figure-3 shows the comparison of precipitating factors of de novo AHF with ADCHF.

Precipitating Factors of De Novo AHF		
Precipitating Factors	**Frequency**	**Percent**
Acute Coronary Syndrome	26	41.93
Uncontrolled Hypertension	24	38.70
Infections	5	8.06
Arrhythmias	5	8.06
Non-Compliance With Drugs	1	1.61
Anemia	1	1.61
Total	62	100

Table-VI. The precipitating factors of de novo onset of acute heart failure.

Table-VII shows the frequency and percentage of precipitating factors of AHF among all patients included in the study.

Precipitating Factors Among All The Patients Presenting With AHF		
Precipitating Factors	**Frequency**	**Percent**
Acute Coronary Syndrome	48	28.2
Uncontrolled Hypertension	40	23.5
Non-Compliance With Drugs	34	20
Arrhythmias	30	17.6
Infections	13	7.6
Anemia	5	2.9
Total	170	100

Table-VII. The distribution of precipitating factors of acute heart failure in the study group.

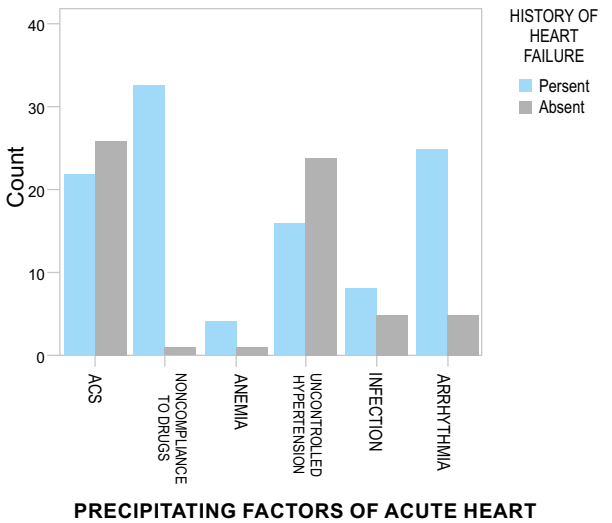

Figure-3. Comparison of the precipitating factors in patients of de novo AHF with precipitating factors of ADCHF.

DISCUSSION

Although 40 to 50 percent episodes of acute heart failure have no identifiable precipitating factors despite of all inquiring efforts and advanced lab results. We still do efforts to make all those factors identifiable.[13] Clinical inquiry skills are the first to start with. Good history taking and clinical examination define most of the precipitating factors.

There are many factors like medical factors, environmental factors, behavioral factors, or factors related to discharge planning and patient and its family counseling which play vital role in the prevention of heart failure presentation.[14] The most commonly identifiable preventable precipitating factors of AHF are ischemia, anemia of chronic illness, uncontrolled hypertension, infections, native disease progression, smoking, arrhythmias and drug and food non-compliance. Smoking cessation sessions should be arranged frequently in hospital premises.

The data regarding the distribution of the precipitating factors of AHF in Pakistan is limited to date. This study is an effort to identify precipitating factors especially the preventable ones, leading to AHF in our community.

In the patients with de novo AHF, the most common precipitating factor was the ACS (41%). Although the patients who follow healthy living style are less affected even there are many factors unknown. In the Euro Heart Failure Survey II (EHFS II), the precipitating factors of total 1329 patients summarized to evaluate detail of precipitating factors. This study is considered an eye opener. After this, much work done for primary prevention of iHD. The ACS was the most common precipitating factor in 43% of the patients of de novo AHF.[15] The second most common precipitating factor was uncontrolled hypertension in our study while in Euro Heart Failure Survey II it was tachy or brady arrhythmias.[15] The role of hypertension control is clear to avoid future cardiac failure events. The hypertension also causes diastolic heart failures. The Role of anti-arrhythmic management

strategies is also important

In patients with ADCHF the most common precipitating factor was noncompliance of drugs (33%). The Euro Heart Failure Survey II, identified arrhythmia (32.5%) as most common precipitating factor.[15] Sandrigo Mangini, et al. determined the characteristics of 212 patients diagnosed with ADCHF. The common factors leading to acute decompensation were ACS (29.7%), poor compliance of medication (23.6%) and hypertension (19.8%).[16] The patients need verbal conversations to emphasis the importance of regular intake of medications and some printed materials which also shows food compliance instructions. The frequent considerations about implantations of ICDs will decrease incidence of life threatening arrhythmias.

In conclusion, the AHF is very attention seeking medical emergency problem with in-hospital mortality rates are 14% to 17%.[17] The precipitating factors of AHF play key role in acute decompensation. The right and to the point treatment of aggravating factors is also the part of treatment of heart failure. Suppose, we recognize tachy arrhythmias like VT and advise ICD, it will prevent future attack of VT leading to heart failure. Similarly, if patient was not given proper instructions about water and salt intake, he will arrive with repeated heart failure episodes. The future direction of this study is to improve the prognosis of AHF in Pakistan.

CONCLUSION

In the study group, mostly patients of AHF were young with mean age of 55 $\pm$ 6.99 years, male (61.8%), Diabetic (53.5%) and have history of chronic Heart Failure (63.5%). In male the most common precipitating factor of AHF was ACS (39.04%) while in female uncontrolled hypertension (38.46%). In diabetic patients the most common precipitating factor of AHF was ACS (30.7%). In patients with Acute Decompensation of Chronic Heart Failure the most common precipitating factor was noncompliance of medication (30.55%) while in patients with de novo Acute Heart Failure it was ACS (41.93%). ACS was the common precipitating factor of Acute Heart Failure (28.2%) among the study group irrespective of gender, diabetes and history of Heart Failure.

STUDY LIMITATIONS

The sample size of the study was small as compare to the international studies, however it provides significant data regarding the precipitating factors of Acute Heart Failure among the patients presented in the emergency department of Punjab Institute of Cardiology, Lahore.

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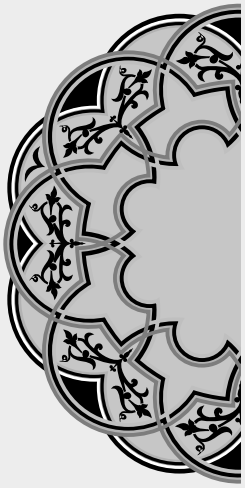

"Great things never came from comfort zones."

Unknown

AUTHORSHIP AND CONTRIBUTION DECLARATION

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3	Dr. Muhammad Nazim	Drafting	
4	Dr. Hafiz M. Faiq Ilyas	Proof Reading	
5	Dr. M. Nouman Ahmad	Data Collection	