

A study of its incidence, risk factors, laboratory parameters and outcome in patients with acute kidney injury and acute decompensated heart failure

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Abstract: *Background:* The burden of HF in India appears high and acute kidney injury is a leading cause of morbidity and mortality. The mechanisms underlying this interaction are complex and multifactorial in nature. *Objective:* To know the incidence, risk factors, laboratory parameters and outcome of such patients. *Methods:* A sample size of 100 cases of admitted to Intensive Care Unit in Al Ameen Medical College Hospital in age group between 20 to 80 years. The study period was December 2016-June2018. *Results:* In this study the mean age is 55.3±12.8 years and majority of patients were male (74%). *Conclusion:* The male predominance, age group 40-50 and 50-60, prompt diagnosis and management reduces morbidity and mortality.

Keywords: Acute Decompensated Heart Failure, Acute Kidney Injury.

Introduction

Heart failure is defined as abnormality of cardiac structure and/or function resulting in clinical symptoms (e.g., dyspnea, fatigue) and signs (e.g., edema, rales), hospitalizations, poor quality of life, and shortened survival [1]. Underlying cardiac disease Includes states that depress systolic ventricular function with reduced ejection fraction (HFrEF; e.g., coronary artery disease [CAD], dilated cardiomyopathies, valvular disease, congenital heart disease); and states of heart failure with preserved ejection fraction (HFpEF; e.g., restrictive cardiomyopathies, hypertrophic cardiomyopathy, fibrosis, endomyocardial disorders), also termed diastolic failure.

Acute precipitating factors for decompensation are excessive Na⁺ intake, noncompliance with heart failure medications, acute MI (may be silent), exacerbation of hypertension, acute arrhythmias, infections and/or fever, pulmonary embolism, anemia, thyrotoxicosis, pregnancy, acute myocarditis or infective endocarditis, and certain drugs (e.g., nonsteroidal anti-inflammatory agents, verapamil). AKI

complicates 5-7% of acute care hospital admissions and up to 30% of admissions to the intensive care units [1]. Acute kidney injury previously known as acute renal failure is characterized by sudden impairment of kidney function resulting in retention of nitrogenous and other waste products normally cleared by the kidney [1].

Material and Methods

The present study was observational study carried out at Tertiary Institute to study the incidence. The study period was December 2016 - June2018. A total of 100 patients selected by simple random with signs and symptoms after obtaining clearance from the Ethical Committee of the institute and permission from the appropriate authority.

Inclusion Criteria included all Patients with acute coronary syndrome Patients with acute heart failure and Patients of cardiac surgery. Exclusion Criteria was patients with Valvularheart disease, Pulmonary embolism, Cardiac temponade, Cardiogenic shock, Multi organ failure, Chronic renal failure, Patients

on dialysis. The statistical analyses performed using the Statistical Package for Social Science (SPSS) version 2 for Windows.

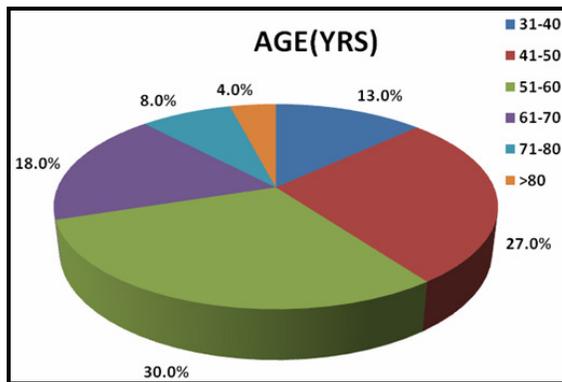
Results

Table-1: Distribution of cases according to age

| Age (Yrs) | N | % |
|-----------|-----|-----|
| 31-40 | 13 | 13 |
| 41-50 | 27 | 27 |
| 51-60 | 30 | 30 |
| 61-70 | 18 | 18 |
| 71-80 | 8 | 8 |
| >80 | 4 | 4 |
| Total | 100 | 100 |

| Age | Range | | mean | SD |
|-----|-------|-----|------|------|
| | Min | Max | | |
| Age | 32 | 88 | 55.3 | 12.8 |

Fig-1: Distribution of cases according to age

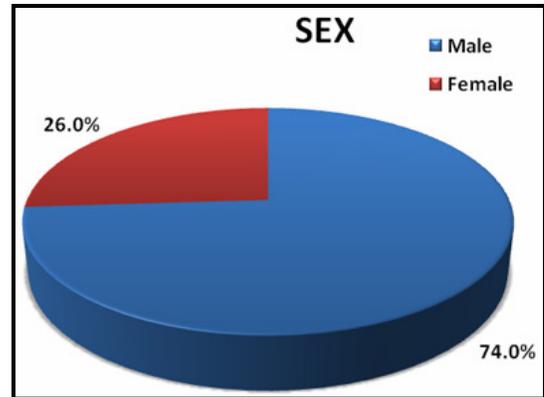


The above table and figure shows distribution of patients according to age. It was observed that majority of patients were in the age group 51-60 years (30%) followed by 41-50 years (27%). The incidence among 61-70 years was 18%, 31-40 was 13%, 71-80 years was 8% and more than 80 years was 4%. Calculated mean age is 55.3±12.8 years.

Table-2: Distribution of cases according to sex

| Sex | N | % |
|--------|-----|-----|
| Male | 74 | 74 |
| Female | 26 | 26 |
| Total | 100 | 100 |

Fig-2: Distribution of cases according to sex

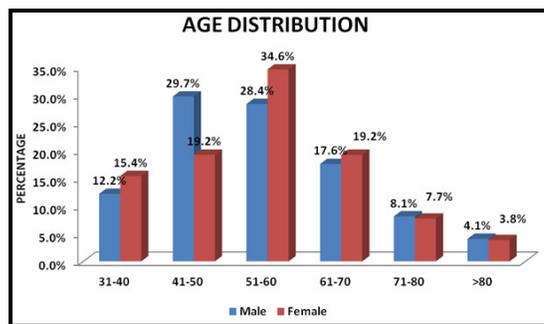


The above table and figure shows distribution of patients according to sex. It was observed that majority of patients were male (74%) and females were 26%.

Table-3: Association of age and sex

| Age (YRS) | Male | | Female | |
|-----------|------|--------|--------|--------|
| | N | % | N | % |
| 31-40 | 9 | 12.2% | 4 | 15.4% |
| 41-50 | 22 | 29.7% | 5 | 19.2% |
| 51-60 | 21 | 28.4% | 9 | 34.6% |
| 61-70 | 13 | 17.6% | 5 | 19.2% |
| 71-80 | 6 | 8.1% | 2 | 7.7% |
| >80 | 3 | 4.1% | 1 | 3.8% |
| Total | 74 | 100.0% | 26 | 100.0% |

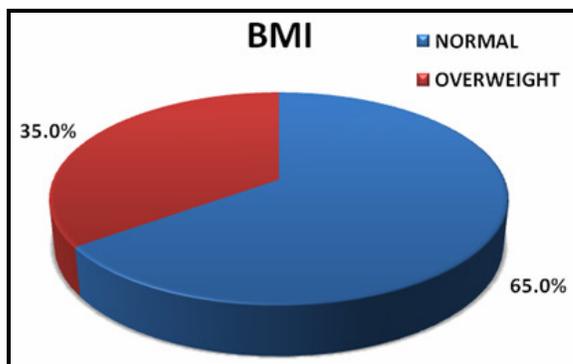
Fig-3: Association of age and sex



The above table and figure shows association of age and sex. It was observed that in age group 51-60 years had more females (34.6%) vs males (28.4%), but in age group 41-50 years males (29.7%) were more than females (19.2%).

| Table-4: Distribution of cases according to BMI | | | | |
|--|--------------|------------|-------------|-----------|
| BMI | | N | % | |
| Normal | | 65 | 65 | |
| Overweight | | 35 | 35 | |
| Total | | 100 | 100 | |
| | Range | | Mean | SD |
| | Min | Max | | |
| BMI | 17.37 | 30.67 | 24.1 | 2.0 |

Fig-4: Distribution of cases according to BMI



The above table and figure shows that most of the patients in this study were within normal BMI (65%) vs Overweight (35%). The mean BMI was 24.1±2.0

Discussion

This complex interplay was demonstrated in a 2006 systematic review of >80,000 patients with chronic heart failure, which demonstrated the concurrent existence of moderate-to-severe renal impairment in 29% of this population [2].

Demographic characteristics: It was observed that majority of patients were in the age group 51-60 years (30%) followed by 41-50 years (27%). The incidence among 61-70 years was 18%, 31-40 was 13%, 71-80 years was 8% and more than 80 years was 4%. Calculated mean age is 55.3±12.8 years. In a study by HR Shah [3] Majority of patients belonged to elderly age group of 61-80 years group. Mean age of males was 64.18±12.95 years and females were 64.64 ± 19.36 years.

Wu et al [4] in a study of total of 52 patients, which included 27 males and 25 females with

showed an average age of 70.7 ± 16.1 years. Pastori et al [5] showed the mean age of the 11 patients with CRS1 was 74.0 ± 13.1 years, and 45% of these patients were male. Zhilian Li et al [6] showed the mean age of 68.6 ± 15.0 years in RIFLE, AKIN and KIDGO classification Le Jemtel et al [7] showed a mean age of 57 ± 11 years which was similar to our result.

Age and Sex: The above table shows distribution of patients according to sex. It was observed that majority of patients were male (74%) and females were 26%. It was observed that majority of patients were in the age group 51-60 years (30%) followed by 41-50 years (27%). In a study by HR Shah [3] Out of 50 patients, about two-third patients were males (66%), which is similar to our result. Zhilian Li et al [6] showed 58% males in all three categories of RIFLE, AKIN and KIDGO classification Antonietta Gigante et al [8] showed males (68.9%) in their study which was similar to our result. Bart et al [9] had in his study found that 75% of the patients were men which is similar to this study.

BMI: The above table shows that most of the patients in this study were within normal BMI (65%) vs Overweight (35%). The mean BMI was 24.1±2.0. Le Jemtel et al [7] showed a mean BMI of 30 ± 5. Pastori et al [5] had 23% obese individuals in their study group.

Conclusion

This study emphasizes the importance of early diagnosis and prompt management to prevent morbidity and mortality. In this study the Calculated mean age is 55.3±12.8 years. It was observed that majority of patients were male (74%) and females were 26%.

This study also emphasizes the importance of the evaluation of both renal and cardiovascular systems to prevent further deterioration in both cardiac and renal function and the cascading effect of the complex interaction between the two organs.

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Conflicts of interest: There are no conflicts of interest.

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