# SUMMARY

# ***Summary***


***Background:***

Acute cardiogenic pulmonary edema is a dramatic manifestation of heart failure and the later is a frequent complication of ACS. Clinical manifestations of acute cardiogenic pulmonary edema (ACPE) appear to be independent of the kind of the underlying acute coronary syndrome (ACS), whether ST-segment myocardial infarction (STEMI), non ST-segment myocardial infarction (NSTEMI), or unstable angina (UA). However, the proportion of these ACS among the consecutive patients with ACPE and the impact of this complication on patients' outcome remain to be defined.

***Objectives:***

The present study was designed to investigate the prevalence, patients' characteristics, impact and outcome of ACPE complicating different types of ACS during the coronary care unit (CCU) admission and during three-month after CCU discharge.

***Patients and methods:***

We studied 210 consecutive patients who were admitted with acute coronary syndrome (ACS). Patients were classified into two groups; group I 172 patients (81.9%) who presented with acute coronary syndrome but without pulmonary edema and group II 38

patients (18.1%) who presented with cardiogenic pulmonary edema due to underlying acute coronary syndrome. They were followed up during their hospital stay and for three-month after hospital discharge for cardiac morbidity and mortality.

***Results:***

The prevalence of ACPE among ACS population in the present study was 18.1% **(Table 3, Figure 1)**. The highest frequency of ACPE was found among patients presented with NSTEMI (23.4%) and the lowest was found among those presented with STEMI (11.9%). Patients with UA had frequency in between other ACS subtypes (21%) **(Table 3, Figure 3)**.

Age and sex were similar between the studied groups **(Table 1).** Patients with ACPE had higher prevalence of other coronary risk factors; hypertension (73.7% vs 58.1%, $p<0.05$), diabetes mellitus (68.4% vs 32%, $p<0.05$), smoking (47.4% vs 40.7%, $p<0.05$) and prior myocardial infarction (57.9% vs 24.4%, $p<0.05$) while had lower prevalence of hyperlipidemia (42.1% vs 55.8%) than those without ACPE **(Table 2, Figure 2)**.

Patients with ACPE had significant elevated SBP, higher HR and higher incidence of arrhythmias (PVCs, AF, VT), LBBB, hypoxia, cardiomegally and lung congestion than those without ACPE (146.3 ± 32.5 vs 129.1 ± 19.9 mmHg, $p<0.05$), (118.1 ± 14.5 vs 88.1 ± 16.8

bpm, p<0.05), (34.2% vs 10.5%, p<0.05), (34.2% vs 1.2%, p<0.05), (39.5% vs 4.7%, p<0.05), (50% vs 0%, p<0.05) and (97.4% vs 0%, p<0.05) respectively **(Table 4, Figure 4)**. On the other hand patients with ACPE had lower peak CK-MB than those without ACPE (92.3 ± 80.2 vs 128.7 ± 107.4, p<0.05).

Patients with ACPE had higher incidence of depressed global left ventricular systolic functions (EF <45%), left ventricular diastolic dysfunction, segmental wall motion abnormalities at rest (SWMA), mitral regurge (MR) and left ventricular hypertrophy (LVH) compared to those without ACPE (84.2% vs 23.2%, p<0.05), (15.8% vs 7%), (68.4% vs 62.2%), (47.4% vs 13.4%, p<0.05) and (39.5% vs 13.4%, p<0.05) respectively **(Table 5, Figure 5)**.

Patients with ACPE had higher incidence of morbidity and mortality during hospital admission compared to those without ACPE. Patients with ACPE had higher incidence of major dysrrhythmia (42.1% vs 7%, p<0.05), cardiogenic shock (28.9% vs 5.2%, p<0.05), recurrent ACPE (18.4% vs 0%), heart failure (10.5% vs 0%), recurrent angina (7.9% vs 4.1%), re-infarction (10.5% vs 2.9%, p<0.05) and early hospital death (10.5% vs 3.5%, p<0.05) **(Table 6, Figure 6)**.

Patients with ACPE had higher incidence of multi-vessel disease than those without ACPE (85.3% vs 34.5%, p<0.05) **(Table 7, Figure**

**7)**. So the need for doing CABG was higher in patients with ACPE (12% vs 5%) **(Table 8, Figure 8)**.

After three-month follow up period, patients with ACPE had significantly higher rates of cardiac morbidity and mortality than those without ACPE; recurrent ACPE (29.4% vs 0%), heart failure (26.4% vs 0%), recurrent angina (23.5% vs 11%, $p<0.05$), re-infarction (29.4% vs 15.1%, $p<0.05$) and long-term mortality (20% vs 9%, $p<0.05$) respectively **(Table 9, Figure 9)**.

The results were tabulated and statistically analyzed.

***Conclusions:***

About one-fifth of patients presenting with ACS had complicating ACPE; NSTEMI and UA are the most frequent causes while STEMI was the least frequent. Irrespective of the kind of underlying ACS, patients with ACPE have several common clinical characteristics such as high incidence of hypertension, diabetes mellitus, previous myocardial infarction, significant arrhythmia, mitral regurgitation and multi-vessel disease. The results of the present study suggest that the underlying mechanism of ACPE may be the extensive ischemia and /or acute ischemic MR. The occurrence of ACPE in patients with ACS leads to increased in-hospital and three months morbidity and mortality.

***Limitations of the study:***

This study was limited by the small number as well as the short follow-up period of the studied population. Also, some modalities for assessment of the cardiac function were not used such as tissue-Doppler study, brain-natiuretic peptide (BNP) assay and pulmonary artery catheter (PAC).