



Precipitating factors leading to decompensation of chronic heart failure in the elderly patient in South-American community hospital

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Abstract

Background Exacerbations of heart failure appear frequently associated with precipitating factors not directly related to the evolution of cardiac disease. There still a paucity of data on the proportional distribution of precipitating factors specifically in elderly patients. The aim of this study was to examine prospectively the precipitating factors leading to hospitalization in elderly patients with heart failure in our community hospital. **Methods** We evaluate elderly patients who need admissions for decompensate heart failure. All patients were reviewed daily by the study investigators at the first 24 h and closely followed-up. Decompensation was defined as the worsening in clinical NYHA class associated with the need for an increase in medical treatment (at minimum intravenously diuretics). **Results** We included 102 patients (mean age 79 ± 12 years). Precipitating factors were identified in 88.5%. The decompensation was sudden in 35% of the cases. Noncompliance with diet was identified in 52% of the patients, lack of adherence to the prescribed medications amounted to 30%. Others precipitating factors were infections (29%), arrhythmias (25%), acute coronary ischemia (22%), and uncontrolled hypertension (15%), miscellaneous causes were detected in 18% of the cases (progression of renal disease 60%, anemia 30% and iatrogenic factors 10%). Concomitant cause was not recognizable in 11.5%. **Conclusions** Large proportion heart failure hospitalizations are associated with preventable precipitating factors. Knowledge of potential precipitating factors may help to optimize treatment and provide guidance for patients with heart failure. The presence of potential precipitating factors should be routinely evaluated in patients presenting chronic heart failure.

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Keywords: heart failure; exacerbation; elderly patient

1 Introduction

Heart failure is a major and growing public health problem. The prevalence of chronic heart failure (CHF) continues to increase despite advances in the treatment of various risk factors for this condition.^[1]

Hospitalizations for CHF are rising in number despite recent advances in treatment. Most admissions to hospital and deaths related to CHF take place in individuals aged 65 or older.^[2]

The syndrome of CHF may gradually worsen, but it frequently progresses with instability in the clinical picture which may lead to death. The assessment and prevention of

factors that precipitate decompensation are therefore an important objective in the care and management of patients.^[3-6] However, there is still a paucity of data on the proportional distribution of various precipitating factors specifically in elderly people.

The aim of this study was to examine prospectively the precipitating factors leading to hospitalization in elderly patients with CHF and systolic dysfunction in our community hospital.

2 Methods

The setting of this study was a community hospital in Mar del Plata, Argentina, which covered 58 039 beneficiaries of the National Institute of Social Services for Retired and Pensioned People (similar to Medicare in the USA) and 23 490 beneficiaries of a health maintenance organization held by the hospital. All patients have a centralized and unique medical record, with coded diagnoses, all contained in an electronic database.

We only evaluate elderly patients (older than 65 years)

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who need admissions for decompensate CHF. All patients were reviewed daily by the study investigators at the first 24 h and closely followed-up with clinical and complementary examinations.

Patients were eligible for the study if they had a previous history and diagnosis of CHF and if the primary admitting diagnosis was decompensated heart failure. The diagnosis of CHF was based on Framingham clinical criteria. We excluded: (1) patients with CHF and preserved left ventricular systolic function (or diastolic dysfunction), (2) patients with dementia or severe psychiatric illness, and (3) patients with newly diagnosed cases of heart failure and acute coronary syndrome complicated by heart failure. Decompensation was defined as the worsening in clinical NYHA class associated with the need for an increase in medical treatment (at minimum intravenously diuretics).

To identify the concomitant factors of instability, we used clinical records and the results of all relevant investigations. Patients were assigned to one of the following subgroups: (1) Arrhythmia: defined as sustained ventricular tachycardia, atrial fibrillation or atrial flutter with rapid ventricular response, and any other supraventricular tachycardia; (2) Uncontrolled hypertension: defined as diastolic blood pressure ≥ 105 mmHg or systolic blood pressure ≥ 180 mmHg; (3) Infection: patients with pulmonary infection, infective endocarditis, urinary infection or sepsis; (4) Acute coronary syndrome: patients with prolonged chest pain and typical electrocardiographic changes suggesting myocardial ischemia; (5) Miscellaneous: patients with CHF plus other acute disease including anemia, worsening renal function, and (6) Inappropriate or inadequate treatment before hospital admission in a compliant patient. We consider noncompliance when the patient stopped taking their drugs or took them intermittently. This subgroup included patients with excessive fluid or sodium intake. Noncompliant patients were considered only if they had none of the previous precipitating factors.

3 Results

The study sample included 102 patients. The mean age was 79 ± 12 years, only 7% were younger than 70 years old. Mean ejection fraction was $31\% \pm 10\%$. On admission, 99% of the patients were in NYHA class III-IV. Ischemic etiology was confirmed in 49% of the patients. Potential precipitating factors for decompensate CHF were identified in 88.5% of patients. The decompensation was sudden in 35% of the cases.

Noncompliance with diet was the most commonly identified causative factor and was noted in 52% of the

patients, lack of adherence to the prescribed medications amounted to 30%. Others factors also related to hospitalization were infections (29%), arrhythmias (25%), acute coronary ischemia (22%), and uncontrolled hypertension (15%), miscellaneous causes were detected in 18% of the cases (progression of renal disease 60%, anemia 30% and iatrogenic factors 10%). Concomitant cause was not recognizable in 11.5%. In hospital mortality was higher in the subgroup with non recognizable precipitating factor (18% vs. 11%, $P = 0.02$).

4 Discussion

Heart failure is a costly, debilitating and deadly condition that has reached epidemic proportions. In Argentina, CHF represents 6% of all hospitalizations and has been considered one of the most frequent causes of death during the last 20 years.^[7]

CHF is clinically characterized by periods of remission and exacerbation. CHF in patients with previously stable compensated heart failure may caused by deteriorating ventricular function, but several precipitating factors have been suggested.^[6] Few investigators, however, have studied the acute precipitants factors of clinical deterioration in the elderly patient specifically. The frequencies of precipitating factors in CHF differ from country to country and according to the population of study.^[8] Identifying PF of CHF exacerbation within the context of a clinical trial^[5,9] or specialized heart failure program^[10] raises the issue of patient selection bias because these patients are more likely to adhere to medication advice and receive closer follow-up than in a usual care setting.

Our results are similar to those reported in other registers in Spain,^[11] China,^[8] Germany^[3] and USA^[4,5]. We emphasize that our population is much older than that reported in studies from specialized centers. In concordance with studies realized in non-specialized centers the most precipitant factor was the noncompliance with medications and diet. This may represent a major impediment to achieving an effective treatment in elderly people.

Infections have been found to be highly prevalent in other studies^[8,11] and their impact on the heart failure patient is noticeable in cold climates.^[12] Infections can precipitate CHF and the mechanism responsible for worsening CHF may be increased total body oxygen consumption due to fever.^[2,12] Additionally patients with CHF are susceptible to respiratory infection because of diminished ability of congestive lungs to expel respiratory secretions.^[2,13]

Arrhythmias were thought to be directly responsible for heart failure decompensation in one quarter of our patients.

The deleterious effect on hemodynamics posed by supraventricular arrhythmias occurring in failing heart is a well known predictor of adverse outcome.

In our study one fifth of the patients suffered myocardial ischemia. The deleterious effects of myocardial ischemia on ventricular function have been well documented even in non-ischemic heart failure. The main cause of myocardial failure is postulated as subendocardial ischemia.^[14] Silent or symptomatic ischemia should be systematically identified in elderly people with acute exacerbation of CHF.

In conclusion, decompensated CHF appear to be frequently associated with concomitant factors not directly related to the evolution of cardiac disease. Knowledge of potential precipitating factors may help to optimize treatment and provide guidance for patients with heart failure. The presence of potential precipitating factors should be routinely evaluated in patients presenting CHF.

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