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Update: Acute Heart Failure (I)

Acute Heart Failure: Epidemiology, Risk Factors, and Prevention

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ABSTRACT

Acute heart failure represents the first cause of hospitalization in elderly persons and is the main determinant of the huge healthcare expenditure related to heart failure. Despite therapeutic advances, the prognosis of acute heart failure is poor, with in-hospital mortality ranging from 4% to 7%, 60- to 90-day mortality ranging from 7% to 11%, and 60- to 90-day rehospitalization from 25% to 30%. Several factors including cardiovascular and noncardiovascular conditions as well as patient-related and iatrogenic factors may precipitate the rapid development or deterioration of signs and symptoms of heart failure, thus leading to an acute heart failure episode that usually requires patient hospitalization. The primary prevention of acute heart failure mainly concerns the prevention, early diagnosis, and treatment of cardiovascular risk factors and heart disease, including coronary artery disease, while the secondary prevention of a new episode of decompensation requires the optimization of heart failure therapy, patient education, and the development of an effective transition and follow-up plan.

Insuficiencia cardiaca aguda: epidemiología, factores de riesgo y prevención

Palabras clave:
Insuficiencia cardiaca aguda
Epidemiología
Factores de riesgo
Prevención

RESUMEN

La insuficiencia cardiaca aguda constituye la primera causa de hospitalización en las personas ancianas y es el principal factor determinante del enorme gasto de asistencia sanitaria asociado a la insuficiencia cardiaca. A pesar de los avances terapéuticos realizados, la insuficiencia cardiaca aguda tiene un mal pronóstico, con una mortalidad hospitalaria que oscila entre el 4 y el 7%, una mortalidad a los 60 a 90 días de entre el 7 y el 11% y una tasa de rehospitalizaciones a los 60 a 90 días que va del 25 al 30%. Hay varios factores, entre los que se encuentran los trastornos cardiovasculares y no cardiovasculares, así como factores relacionados con el paciente y factores iatrogénicos, que pueden desencadenar una progresión rápida o un agravamiento de los signos y síntomas de insuficiencia cardiaca, lo que conduce a un episodio de insuficiencia cardiaca aguda que suele requerir el ingreso hospitalario del paciente. La prevención primaria de la insuficiencia cardiaca aguda se centra principalmente en la prevención, el diagnóstico precoz y el tratamiento de los factores de riesgo cardiovascular y la cardiopatía, incluida la enfermedad coronaria, mientras que la prevención secundaria para evitar nuevos episodios de descompensación requiere la optimización del tratamiento de la insuficiencia cardiaca, la educación sanitaria del paciente y el desarrollo de una transición y un plan de seguimiento efectivos.

Abbreviations

AHF: acute heart failure

INTRODUCTION

Acute heart failure (AHF) is the rapid development or change of signs and symptoms of heart failure that requires medical attention and usually leads to patient hospitalization.[1–3] Acute heart failure represents the first cause of hospital admission in elderly persons in the western world and, despite advances in medical and device therapy, it still has unacceptably high morbidity and mortality rates. As a result, AHF represents a major public health issue, an enormous financial burden, and a challenge for current cardiovascular research.[3]

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EPIDEMIOLOGY

A number of large-scale registries, such as the ADHERE[4–6] and OPTIMIZE-HF performed in the United States,[4–7] the EHFS I and II[8–10] and the ESC-HF Pilot registry performed in Europe,[8–11] as well as the international ALARM-HF[12] have provided us with some epidemiological evidence on AHF.

Patients admitted for AHF are aged > 70 years and about half of them are male. Most have a previous history a heart failure, while *de novo* AHF represents only one-fourth to one-third of cases. About 40% to 55% have preserved LVEF (left ventricular ejection fraction). Those patients have a constellation of cardiovascular and noncardiovascular abnormalities. Concerning cardiovascular comorbid conditions, most AHF patients have a history of arterial hypertension, about half have coronary artery disease, and one-third or more have atrial fibrillation. In terms of noncardiovascular comorbidities, about 40% of patients admitted for AHF have a history of diabetes mellitus, about one-fourth to one-third have renal dysfunction and chronic obstructive pulmonary disease, while anemia is also present in 15% to 30% of patients. The main clinical features of AHF patients according to the aforementioned registries are outlined in Table 1.

In most of the published AHF registries, in-hospital mortality ranges from 4% to 7% (Table 2), with the exception of ALARM-HF, in which mortality was as high as 11%, apparently due to the relatively higher proportion of patients with cardiogenic shock (around 12% vs < 4% in the rest of the aforementioned registries). The median length of hospital stay ranged from 4 days to 11 days. Postdischarge mortality up to 3 months was 7% to 11%, while 1-year postdischarge mortality reported by the ADHERE registry was 36%.[5] Heart failure progression itself represents the cause of death in less than half of patients. According to data from the EVEREST trial,[13] 41% of AHF patients die of heart failure deterioration, 26% die suddenly, and 13% die of noncardiovascular comorbidities. It should be stressed that, although in-hospital mortality tends to be higher in patients with reduced LEVF compared with those with preserved LVEF, postdischarge morbidity is similar in the 2 groups.[14]

Postdischarge rehospitalization rates are quite high, as about one-fourth of patients are readmitted within 3 months, while two-thirds of them are rehospitalized within a year. It has been shown that the readmission rate follows a biphasic course consisting of 2 peaks, an early one during the first 2 to 3 months postdischarge and a late one during the final stage of the syndrome, separated by a long plateau phase with low admission rates.[15]

Table 1
Clinical Characteristic of Acute Heart Failure Patients in Different Registries

	ADHERE	OPTIMIZE-HF	E HFS I	EHFS II	ESC-HF Pilot (AHF arm)	ALARM-HF
Patients, No.	105 388	48 612	11 327	3580	1892	4953
Age, mean (SD), y	72.0 (14.0)	73.1 (14.2)	71	69.9 (12.5)	70.0 (13.0)	66-70*
Gender, male, %	48	48	53	61	63	62
History of heart failure, %	75	87	65	63	75	64
Arterial hypertension, %	72.0	71.0	53.0	62.5	61.8	70.2
Coronary artery disease, %	57.0	50.0	68.0	53.6	50.7	30.7
Diabetes mellitus, %	44.0	42.0	27.0	32.8	35.1	45.3
Atrial fibrillation, %	31.0	31.0	43.0	38.7	43.7	24.4
Renal dysfunction, %	30.0	30.0	17.0	16.8	26.0	21.4
COPD, %	31.0	28.0		19.3		24.8
Anemia, %				14.7	31.4	14.4

ADHERE, Acute Decompensated Heart Failure National Registry; AHF, acute heart failure; ALARM-HF, Acute Heart Failure Global Survey of Standard Treatment; COPD, chronic obstructive pulmonary disease; EHFS, EuroHeart Failure Survey; ESC-HF Pilot, European Society of Cardiology-Heart Failure Pilot registry; OPTIMIZE-HF, Organized Program to Initiate Lifesaving Treatment in Hospitalized Patients with Heart Failure; SD, standard deviation.
* Median.

Table 2
Acute Heart Failure Outcome in Different Registries

	ADHERE	OPTIMIZE-HF	EHFS I	EHFS II	ESC-HF Pilot (AHF arm)	ALARM-HF
Patients, No.	105 388	48 612	11 327	3580	1892	4953
In-hospital mortality, %	4.0	4.0	6.9	6.7	3.8	11.0
Hospital stay, median, days	4	4	11	9	8	6
30-90-days mortality, %	11.2 (30 days)	9.0 (60-90 days)	6.6 (90 days)			
1-year mortality, %	36					
Readmission (time period),	22.1 (30 days) 65.8 (1 year)	30.0 (60-90 days)	24.0 (90 days)			

ADHERE, Acute Decompensated Heart Failure National Registry; AHF, acute heart failure; A LARM-HF, Acute Heart Failure Global Survey of Standard Treatment; EHFS, EuroHeart Failure Survey; ESC-HF Pilot, European Society of Cardiology-Heart Failure Pilot registry;OPTIMIZE-HF, Organized Program to Initiate Lifesaving Treatment in Hospitalized Patients with Heart Failure.