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Original article

Heart Failure in Acute Myocardial Infarction: a Comparison Between Patients With or Without Heart Failure Criteria From the FAST-MI Registry

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ABSTRACT

Introduction and objectives: To compare acute myocardial infarction patients with or without congestive heart failure in the French FAST-MI registry.
Methods: The French FAST-MI registry included 374 centers and 3059 patients over a 1-month period at the end of 2005, with 1-year follow-up. Among this population, patients with at least one congestive heart failure criterion constituted group 1 (n=1149; 37.5%) and were compared to patients without congestive heart failure (group 2, n=1910; 62.5%). The congestive heart failure patients were further divided according to presence of both beta-blockers and antagonists of the renin-angiotensin-aldosterone system at hospital discharge (n=511) or not (n=498), in order to assess the real-world clinical importance of recommended medications.
Results: Overall in-hospital and 1-year mortality rates were 3.4% and 13.2%, respectively. In hospital survivors, presence of congestive heart failure was associated with increased mortality (adjusted hazard ratio=1.55; 95% confidence interval, 1.10-2.17; *P*=.01). Survival was higher in patients without congestive heart failure, compared with congestive heart failure patients receiving or not recommended medications (*P*<.001). Congestive heart failure patients receiving neither renin-angiotensin-aldosterone system blockers nor beta-blockers (adjusted hazard ratio=1.66; 95% confidence interval, 1.08-2.55; *P*=.02) had a significantly higher risk of death than patients receiving both classes of medications (adjusted hazard ratio=1.16; 95% confidence interval, 0.82-1.64; not statistically significant). Patients receiving only one of the recommended classes had an intermediate risk (adjusted hazard ratio=1.47; 95% confidence interval, 1.04-2.07; *P*=.03).
Conclusions: Patients admitted for acute myocardial infarction with congestive heart failure criteria are still at very high risk of mortality. When receiving major recommended medications, they presented with significantly reduced mortality rates. Additional efforts should therefore be made to encourage the prescription of recommended medications in acute myocardial infarction patients with congestive heart failure.
Trial registration: ClinicalTrials.gov number: NCT00673036.

Insuficiencia cardiaca en el infarto agudo de miocardio: comparación de pacientes con o sin criterios de insuficiencia cardiaca del registro FAST-MI

Palabras clave:
Infarto de miocardio
Insuficiencia cardiaca
Supervivencia
Bloqueadores beta
Antagonistas de los receptores de la angiotensina II

RESUMEN

Introducción y objetivos: Comparar a los pacientes con infarto agudo de miocardio, con o sin insuficiencia cardiaca congestiva, en el registro francés FAST-MI.
Métodos: El registro francés FAST-MI incluyó 374 centros y a 3.059 pacientes a lo largo de un periodo de 1 mes a finales de 2005, con un seguimiento de 1 año. En esta población, los pacientes con al menos un criterio de insuficiencia cardiaca congestiva constituyeron el grupo 1 (n = 1.149; 37,5%) y se los comparó con los pacientes sin insuficiencia cardiaca congestiva (grupo 2, n = 1.910; 62,5%). Se subdividió a los pacientes con insuficiencia cardiaca congestiva según estuvieran en tratamiento con bloqueadores

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Inhibidores de la enzima de conversión de la angiotensina

beta y antagonistas del sistema renina-angiotensina-aldosterona en el momento del alta hospitalaria (n = 511) o no siguieran este tratamiento (n = 498), con objeto de valorar la importancia en la práctica clínica real de las medicaciones recomendadas.

Resultados: Las tasas generales de mortalidad intrahospitalaria y mortalidad a 1 año fueron del 3,4 y el 13,2%, respectivamente. En los pacientes que sobrevivieron a la hospitalización, la insuficiencia cardiaca congestiva se asoció a un aumento de la mortalidad (*hazard ratio* ajustada = 1,55; intervalo de confianza del 95%, 1,10-2,17; p = 0,01). La supervivencia fue mayor entre los pacientes sin insuficiencia cardiaca congestiva que entre los pacientes con insuficiencia cardiaca congestiva tratados o no con las medicaciones recomendadas ($p < 0,001$). Los pacientes con insuficiencia cardiaca congestiva que no recibían tratamiento con antagonistas del sistema renina-angiotensina-aldosterona ni con bloqueadores beta (*hazard ratio* ajustada = 1,66; intervalo de confianza del 95%, 1,08-2,55; p = 0,02) presentaron un riesgo de muerte significativamente superior que los pacientes que recibían ambas clases de medicación (*hazard ratio* ajustada = 1,16; intervalo de confianza del 95%, 0,82-1,64; sin significación estadística). Los pacientes que recibían sólo una de las clases de medicación recomendadas presentaron un riesgo intermedio (*hazard ratio* ajustada = 1,47; intervalo de confianza del 95%, 1,04-2,07; p = 0,03).

Conclusiones: Los pacientes ingresados por un infarto agudo de miocardio que cumplen los criterios de insuficiencia cardiaca congestiva continúan teniendo un riesgo de muerte muy elevado. Cuando se les administraban las principales medicaciones recomendadas, sus tasas de mortalidad fueron significativamente más bajas. Se deberá tomar nuevas medidas para fomentar la prescripción de las medicaciones recomendadas a los pacientes con infarto agudo de miocardio que presentan insuficiencia cardiaca congestiva.

Registro del ensayo: ClinicalTrials.gov número: NCT00673036.

Abbreviations

ACE: angiotensin-converting enzyme
CHF: congestive heart failure
FAST-MI: French nationwide Acute ST-elevation and non-ST-elevation Myocardial Infarction
LVEF: left ventricular ejection fraction
MI: myocardial infarction
RAAS: renin-angiotensin-aldosterone system

INTRODUCTION

Clinical trials have shown that combining beta-blockers (BB) and angiotensin-converting enzyme (ACE) inhibitors has an addictive effect in reducing short- and long-term mortality and morbidity in patients with congestive heart failure (CHF) due to either left ventricular systolic dysfunction[1–3] or acute myocardial infarction (MI) with left ventricular dysfunction with or without symptoms of CHF.[4–7] Guidelines have been published, specifying the optimal treatment strategies for such patients.[8] For each type of CHF conditions, several important registries have provided useful information on the prescription of recommended drugs and their impact on long-term mortality, showing an important under-prescription despite a major role on reducing mortality.[9,10] Available data from registries have shown the importance of recommended drugs used in the context of either MI[9,11,12] or CHF.[10] However, the real impact of these drugs on survival when combining CHF in acute MI in the context of real life has not been demonstrated. The French nationwide Acute ST-elevation and non-ST-elevation Myocardial Infarction (FAST-MI) 2005 survey is a prospective registry of all patients admitted to an intensive care unit (ICU) in France for acute MI by the end of 2005.[13] It gives the opportunity to analyze the specific characteristics of patients presenting with CHF criteria within the population of patients with acute MI.

The purpose of the present study is to compare the baseline clinical profile, drug prescriptions at hospital discharge, and short- and long-term mortality and morbidity in acute MI patients with or without CHF.

METHODS

Population

The objectives of the FAST-MI 2005 registry were to gather complete and representative data on the management and outcome of patients admitted to ICU for acute MI during a 1-month period in France, irrespective of the type of institution to which the patients were admitted (that is, university hospitals, public hospitals, or private clinics). The FAST-MI design has been already described in detail.[13] In summary, from a list of all ICUs or coronary care units admitting patients at the acute stage of MI, 374 centers gave their consent to participate: 42 university hospitals, 225 public hospitals, 96 private clinics and 11 other centers. The final participation rate was 93% (n=39) for university hospitals, 59% (n=132) for public hospitals, 46% (n=44) for private clinics and 73% (n=8) for other centers.[13]

Patient Selection

All consecutive patients admitted to the participating centers November 1-30, 2005 were included in the registry if they met the following criteria:

- Diagnosis of acute MI based on serum markers more than twice the upper limit of normal for creatine kinase, creatine kinase MB fraction, or troponins; and either chest pain lasting for at least 30 min and not relieved by nitrates or electrocardiogram changes on at least 2 contiguous leads with pathological Q waves (at least 0.04 s) or persisting ST-elevation or depression >0.1 mV.
- Less than 48 h from the beginning of symptoms to ICU admission.
- Informed consent for participation in the survey and follow-up.

Among the whole population, patients with at least one of the following criteria were defined as CHF patients (group 1):

- Previous CHF history before admission.
- Symptoms of CHF on admission according to the Framingham criteria.[14]
- Killip class≥2 on admission.
- Killip class≥2 at any time of hospitalization.
- Left ventricular ejection fraction (LVEF)≤40% at any time during hospitalization.