Reinfarction as a Complication of Acute Myocardial Infarction. PRIMVAC Registry Data

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Introduction and objectives. The clinical profile of patients with acute myocardial infarction (AMI) who have reinfarction (REAMI) during their stay in the intensive cardiologic care unit (ICCU) is not well known. The aim of this study was to identify factors predictive of REAMI, as well as its global incidence and mortality.

Patients and method. All patients with AMI admitted to the ICCU of 17 hospitals in the Comunidad de Valencia (Spain) in the period 1995-2000 (PRIMVAC Registry) were included. Differential characteristics between patients with or without REAMI were determined, and odds ratios (OR) for possible predictive factors were estimated with their 95% confidence intervals by logistic regression.

Results. A total of 12 071 patients were included. Mean age of the patients was of 65.5 years, the percentage of women was 23.8%, and the incidence of REAMI was 2.8%. The REAMI group was significantly older than the non-REAMI group. Female sex was significantly more common in the REAMI group. More diagnostic and therapeutic procedures were carried out, more drugs were used and there were more complications in the REAMI group. Mortality was significantly higher in the REAMI group (37.8% vs 12.6%). Only age, diabetes mellitus, previous myocardial infarction, and the appearance of Q waves in the electrocardiogram were independently associated with the presence of REAMI.

Conclusions. REAMI in the ICCU was associated with high mortality. Some clinical factors present during the first few hours after AMI were associated independently with the appearance of REAMI.

Key words: Risk factors. Myocardial infarction. Registry. Reinfarction.

*The investigators involved in the Acute Myocardial Infarction Registry Project of Valencia, Alicante and Castellón (PRIMVAC) are listed at the end of the article.

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El reinfarto como complicación del infarto agudo de miocardio. Datos del registro PRIMVAC

Introducción y objetivos. El perfil clínico de los pacientes con infarto agudo de miocardio (IAM) que presentan un reinfarto (REIAM) durante su estancia en la unidad de cuidados intensivos cardiológicos (UCIC) es poco conocido. El objetivo de este trabajo es determinar los factores predictores de REIAM, su incidencia global y su mortalidad.

Pacientes y método. Se incluyó a todos los pacientes con IAM ingresados en las UCIC de 17 hospitales de la Comunidad Valenciana en el período 1995-2000. Se determinaron las características diferenciales de los pacientes con y sin REIAM, y se calcularon las odds ratio y sus intervalos de confianza del 95% mediante un análisis de regresión logística para los posibles factores predictores.

Resultados. Se incluyó a 12.071 pacientes con IAM. La edad media fue de 65,5 años, la proporción de mujeres del 23,8% y la incidencia de REIAM del 2,8%. La edad fue significativamente mayor en el grupo con REIAM que en el grupo sin REIAM, al igual que el porcentaje de mujeres. Se realizaron más procedimientos, se utilizaron más fármacos y hubo más complicaciones en el grupo con REIAM. La mortalidad fue significativamente mayor en el grupo con REIAM (37,8 frente a 12,6%). La edad, la diabetes mellitus, el infarto de miocardio previo y el desarrollo de onda Q en el electrocardiograma se asociaron de forma independiente con la presencia de REIAM.

Conclusiones. El REIAM en la UCIC conlleva una alta mortalidad. Algunos factores presentes en las primeras horas del IAM se asocian con la aparición de REIAM.

Palabras clave: Factores de riesgo. Infarto de miocardio. Registro. Reinfarto.

ABBREVIATIONS

AMI: acute myocardial infarction.
ACE inhibitor: angiotensin-converting enzyme inhibitor.
PRIMVAC: Acute Myocardial Infarction Registry Project of Valencia, Alicante, and Castellón.
REAMI: reinfarction.
ICCU: intensive cardiologic care unit.

INTRODUCTION

Reinfarction (REAMI) is a serious complication that can present after acute myocardial infarction (AMI) in patients in the intensive cardiologic care unit (ICCU). It is a heterogeneous entity with a complex pathophysiology that extends the damage produced by the AMI that led to the hospitalization of the patient (index AMI), worsening the course.[1] There is still little information concerning its incidence, the clinical profile of the patients in whom it occurs and the factors that cause it during the hospital stay. Most of the studies on the variables predictive of the onset of REAMI refer to that occurring during the months after hospital discharge.[2-4]

The PRIMVAC (Acute Myocardial Infarction Registry Project of Valencia, Alicante, and Castellón) is a registry of cases of AMI resulting in ICCU admission in the hospitals of the Community of Valencia. Since its establishment in 1995, it has collected comprehensive data on the clinical characteristics of a large number of AMI patients.

The objective of this study was to determine the incidence, mortality rate, clinical features and factors predictive of REAMI occurring in the ICCU on the basis of the analysis of the PRIMVAC Registry data.

PATIENTS AND METHODS

All the patients enrolled in the PRIMVAC Registry between 1 January 1995 and 31 December 2000 were included. This registry consists of the patients admitted to the ICCU of 17 hospitals in the Community of Valencia with a diagnosis of AMI. The participating hospitals serve approximately 72% of the total population of this autonomous community (4 162 780 inhabitants according to the 2001 census). The design of the PRIMVAC Registry and the characteristics of the participating centers were described in a previous report.[5]

Two groups were established: patients who had a REAMI during their ICCU stay and those who did not. We adopted the definition of REAMI used for the PRIMVAC Registry: clear evidence, more than 24 hours after the index AMI, of a renewed increase in cardiac enzymes (more than twice the laboratory reference values if they had decreased to below that level), with or without chest pain and/or electrocardiographic changes (ST segment elevation or depression), which can occur in the same leads as the index AMI or in others. For the diagnosis, cardiac enzymes were measured at least once every 24 hours. We analyzed the demographic characteristics, coronary history, coronary risk factors, electrocardiographic data from the index AMI, diagnostic and therapeutic procedures carried out during the ICCU stay, medication administered during the ICCU stay and the complications presenting in the ICCU. These variables have been defined elsewhere.[5]

Statistical Analysis

The quantitative (continuous) variables are expressed as the mean and standard deviation and the proportions as percentages. The differences between the categorical variables were analyzed using the Pearson χ^2 test with Yates' correction and Fisher's exact test, when necessary. For the continuous variables, Student's *t* test was employed. All statistical tests were two-sided and considered significant at $P<.05$.

A logistic regression model was used to predict the onset of REAMI. The following variables were assessed during the first 24 hours after the index AMI: age, sex, smoking habits, hypercholesterolemia, hypertension, diabetes mellitus, previous myocardial infarction, Q wave index infarction (or undetermined), and thrombolysis. The variables were included according to their relevance, not on the basis of the results of univariate analysis. All the variables were made to remain within the model. Risk was estimated using odds ratio (OR), and 95% confidence intervals (CI) were calculated.

RESULTS

The PRIMVAC registry included a total of 12 071 patients with AMI. The overall mean age was 65.5±12.05 years and 23.8% were women. Thrombolysis was performed in 5 139 patients (42.6%). There were 344 REAMI, for an overall incidence of 2.8%. Age was significantly greater in the REAMI group (69.5±10.4 years) than in the non-REAMI group (65.4±12.1 years) ($P<.001$). The proportion of women was also higher in the REAMI group (34.3% vs 23.5%; $P<.001$).

Patient History and Risk Factors

The patient histories and risk factors of the REAMI and non-REAMI groups are shown in Table 1. In the REAMI group, the incidences of diabetes melli-