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Original article

Acute Myocardial Infarction Population Incidence and Mortality Rates, and 28-day Case-fatality in Older Adults. The REGICOR Study

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ABSTRACT

Introduction and objectives: Our aims were to determine acute myocardial infarction (AMI) incidence and mortality rates, and population and in-hospital case-fatality in the population older than 74 years; variability in clinical characteristics and AMI management of hospitalized patients, and changes in the incidence and mortality rates, case-fatality, and management by age groups from 1996 to 1997 and 2007 to 2008.
Methods: A population-based AMI registry in Girona (Catalonia, Spain) including individuals with suspected AMI older than 34 years.
Results: The incidence rate increased with age from 169 and 28 cases/100 000 per year in the group aged 35 to 64 years to 2306 and 1384 cases/100 000 per year in the group aged 85 to 94 years, in men and women, respectively. Population case-fatality also increased with age, from 19% in the group aged 35 to 64 years to 84% in the group aged 85 to 94 years. A lower population case-fatality was observed in the second period, mainly explained by a lower in-hospital case-fatality. The use of invasive procedures and effective drugs decreased with age but increased in the second period in all ages up to 84 years.
Conclusions: Acute myocardial infarction incidence, mortality, and case-fatality increased exponentially with age. There is still a gap in the use of invasive procedures and effective drugs between younger and older patients.

Tasas de incidencia y mortalidad, y letalidad poblacional a 28 días del infarto agudo de miocardio en adultos mayores. Estudio REGICOR

Palabras clave:
Infarto de miocardio
Incidencia
Mortalidad
Letalidad
Adultos mayores

RESUMEN

Introducción y objetivos: Los objetivos son determinar las tasas de incidencia y mortalidad, y la mortalidad poblacional y hospitalaria por infarto agudo de miocardio (IAM) de la población mayor de 74 años, la variabilidad en las características clínicas y el tratamiento de los pacientes hospitalizados, y los cambios en las tasas de incidencia y mortalidad, en la letalidad hospitalaria y en el tratamiento del IAM por grupos de edad entre 1996-1997 y 2007-2008.
Métodos: Registro poblacional de IAM en Girona (Cataluña) que incluyó a pacientes con IAM mayores de 34 años.
Resultados: La tasa de incidencia aumentó con la edad en varones y mujeres, respectivamente, de 169 y 28 casos/100.000/año en el grupo de 35-64 años a 2.306 y 1.384 casos/100.000/año en el de 85-94 años. La letalidad poblacional también aumentó con la edad, del 19% en el grupo de 35-64 años al 84% en el de 85-94 años. Se observó un descenso en la letalidad poblacional en el segundo periodo analizado, explicado por un descenso en la letalidad hospitalaria. El uso de procedimientos invasivos y fármacos de eficacia demostrada disminuyó con la edad, aunque aumentó en el segundo periodo en todos los grupos de edad hasta los 84 años.

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Conclusiones: La incidencia, la mortalidad y la letalidad hospitalaria del IAM aumentaron exponencialmente con la edad. Todavía se observan diferencias en el uso de procedimientos invasivos y fármacos de eficacia demostrada entre grupos de edad.

Abbreviation

AMI: acute myocardial infarction

INTRODUCTION

Ischemic heart disease continues to be the single most important cause of mortality, morbidity, and hospitalization rates in both high-income[1,2] and low-income countries.[3] Acute myocardial infarction (AMI) is a critical presentation of this disease, owing to its high case-fatality.[4] Recent studies indicate that AMI event rates have declined since 1985 in most populations[1,5]; however, these studies limited their population upper age limit to 65 or 74 years. Data are scarce on the growing European population older than 74 years.[6–8]

The prevalence and incidence of chronic conditions and associated events, among them AMI, will increase in parallel with population aging.[9] Older patients who present with an AMI tend to have more comorbidities, higher case-fatality, and fewer pharmacological and interventional treatments,[6,10–12] making it essential to monitor AMI burden, case-fatality, and hospital management at the population level and across all ages.

The present study had 4 aims: *a)* to determine AMI incidence and mortality rates in the population older than 74 years compared with those in younger age groups; *b)* to determine the in-hospital AMI 28-day case-fatality in this population; *c)* to assess the variability in clinical characteristics and AMI management of hospitalized patients across age groups; and *d)* to analyze changes in the incidence and mortality rates, case-fatality, and management by age groups from 1996 to 1997 and 2007 to 2008.

METHODS

Design

The REGICOR (*Registre Gironí del COR* or Girona Heart Registry in English) population-based AMI registry for the province of Girona, Catalonia (Spain) included all AMI cases from 1990 to 2009 in the population aged 25 to 74 years. From January 1996 to December 1997 and from January 2007 to December 2008, the registry was extended to include all residents in the study area who were older than 74 years. The present analysis included AMI cases in REGICOR participants older than 34 years.

The methods used in this registry have been described in detail elsewhere.[6,13] Briefly, the monitored area included 6 counties of Girona Province in northeast Catalonia (Spain). The population older than 34 years consisted of 339 352 inhabitants in the 1996 to 1997 census and 488 804 in the official 2007 to 2008 intercensus estimate.[14] Population distribution by age and sex is presented in Table 1. The study region has 6 community hospitals that send all AMI patients, after emergency treatment, to the single referral hospital with a coronary care unit in the region. This network of public hospitals covers the entire population.

The study protocol was approved by the local ethics committee and was conducted according to the principles expressed in the Declaration of Helsinki.

Case-finding Procedures

The MONICA methodology was used to identify and investigate possible AMI cases.[15] Briefly, AMI patients admitted to the referral coronary care unit were prospectively registered; those admitted to the referral hospital but not treated in the coronary care unit and those admitted and treated in the community hospitals were retrospectively registered. For this retrospective registry, we

Table 1
Reference Population and Number of AMI and Fatal AMI Cases Registered in the 2 Study Periods (1996-1997 and 2007-2008)

	1996-1997			2007-2008				
		CPK cases			CPK cases		Troponin cases	
	Reference population by age group	Nonfatal AMI	Fatal AMI	Reference population by age group	Nonfatal AMI	Fatal AMI	Nonfatal AMI	Fatal AMI
Men								
35-64 y	91 034	218 (69.4)	96 (30.6)	138 097	376 (80.5)	91 (19.5)	445 (83)	91 (17)
65-74 y	22 691	166 (53.4)	145 (46.6)	23 812	163 (63.4)	94 (36.6)	217 (70)	93 (30)
75-84 y	10 440	84 (29.6)	200 (70.4)	16 647	154 (41.6)	216 (58.4)	243 (52.9)	216 (47.1)
85-94 y	2568	17 (17.5)	80 (82.5)	3990	34 (18.5)	150 (81.5)	92 (38)	150 (62)
Women								
35-64 y	88 941	37 (60.7)	2	130 101	59 (80.8)	14 (19.2)	86 (86)	14 (14)
65-74 y	25 537	57 (52.3)	52 (47.7)	25 999	55 (62.5)	33 (37.5)	84 (71.8)	33 (28.2)
75-84 y	15 226	58 (35.6)	105 (64.4)	22 642	104 (39.8)	157 (60.2)	190 (54.8)	157 (45.2)
85-94 y	4691	19 (15.3)	122 (84.7)	8239	37 (16.2)	191 (83.8)	102 (34.8)	191 (65.2)

AMI, acute myocardial infarction; CPK, creatinine phosphokinase.
Data are expressed as No. of individuals or No. (%).
From 2007 to 2008, 2 AMI definitions were applied, excluding and including troponin levels (CPK and troponin cases, respectively).

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