

Risk factors in patients with acute coronary syndrome referred for coronary angiography

Ángel Y. Rodríguez Navarro^a, MD; Adrián A. Naranjo Domínguez^b, MD; and Ronald Aroche Aportela^b, MD

^a Medical University of Pinar del Rio. Pinar del Río, Cuba.

^b Center for Medical and Surgical Research (CIMEQ). Havana, Cuba.

Este artículo también está disponible en español

ARTICLE INFORMATION

Received: 24 de octubre de 2012

Accepted: 14 de enero de 2013

Competing interests

The authors declare no competing interests

Acronyms

CVRF: cardiovascular risk factors

NSTEMI: non-ST segment elevation myocardial infarction

STEMI: ST segment elevation myocardial infarction

On-Line Versions:

Spanish - English

✉ AA Naranjo Domínguez
Calle 4ta. Edif N° 2 Apto 23-C
Reperto 10 de Octubre
Pinar del Río, Cuba
E-mail address:
adrian90@princesa.pri.sld.cu

ABSTRACT

Introduction: Coronary risk factors are biological characteristics that increase the likelihood of cardiovascular disease.

Objective: To characterize the presence of modifiable risk factors in patients referred for coronary angiography from Pinar del Rio to the CIMEQ Hospital, in the context of an acute coronary syndrome.

Method: Retrospective study of patients treated at the Laboratory of Hemodynamics of the CIMEQ Hospital, from October 1997 to August 2008. The study population consisted of 5 297 patients who underwent coronary angiography in the specified period, of which 147 emergency cases sent from Pinar del Rio province with a diagnosis of acute coronary syndrome, with or without ST segment elevation, were analyzed. The data were obtained from the ANGYCOR database.

Results: In the 126 patients with that syndrome and without ST elevation (85.7%), the most prevalent risk factor was hypertension (64%); and in those with ST elevation, it was smoking (61.9%). Patients between 50 and 70 years of age (66.7%), and males (75.5%), were the most affected.

Conclusions: In both groups, there was a predominance of males and the age group of 50-70 years. Nine out of ten patients had at least two of the classic risk factors; and smoking and hypertension were the most frequent ones.

Key words: Coronary risk factors, Ischemic heart disease, Coronary angiography

Factores de riesgo en pacientes con síndrome coronario agudo remitidos para coronariografía

RESUMEN

Introducción: Los factores de riesgo coronario son características biológicas que aumentan la probabilidad de padecer una enfermedad cardiovascular.

Objetivo: Caracterizar la presencia de algunos factores de riesgo modificables en pacientes remitidos desde Pinar del Río al Hospital CIMEQ para coronariografía, en el contexto del síndrome coronario agudo.

Método: Estudio retrospectivo con los pacientes atendidos en el Laboratorio de He-

Hemodinámica del CIMEQ, entre octubre de 1997 y agosto del 2008. La población de estudio estuvo constituida por los 5.297 pacientes a los que se les realizó coronariografía en el período señalado, de los cuales se analizaron los 147 remitidos de urgencia desde la provincia Pinar del Río, con el diagnóstico de síndrome coronario agudo, con y sin elevación del segmento ST. Los datos se obtuvieron de la base de datos ANGYCOR.

Resultados: El factor de riesgo más prevalente en los 126 pacientes con dicho síndrome, sin elevación del ST (85,7%), fue la hipertensión arterial (64 %); y el hábito de fumar (61,9 %) en aquellos con elevación del ST. Los pacientes entre 50 y 70 años (66,7 %) y los del sexo masculino (75,5 %) fueron los más afectados.

Conclusiones: Predominó el sexo masculino y el grupo de edades de 50-70 años en ambos grupos. Nueve de cada diez pacientes tienen al menos dos de los factores de riesgo clásicos, y el hábito de fumar y la hipertensión arterial fueron los más frecuentes.

Palabras clave: Factores de riesgo coronario, Cardiopatía isquémica, Coronariografía

INTRODUCTION

Cardiovascular diseases have been the leading cause of death in the country for many years¹. In 2007, 23796 deaths were reported by health authorities and, among them, 16435 deaths occurred in patients with ischemic heart disease, accounting for 72.33%¹.

In the United States, the annual incidence of acute myocardial infarctions is 865000, of which 500000 include ST-segment elevation. Mortality in patients with myocardial infarction has decreased substantially in the last 20 years; however, it is important to note that up to a third of patients with this disease, who could received reperfusion therapy, are not treated acutely, and this proportion is much higher in Latin America². Reperfusion treatment of the coronary artery involved, when it is administered promptly, either by fibrinolysis or primary angioplasty, has been established as the treatment of choice in these patients².

Interventional cardiology has experienced a progressive development over the last decade. The introduction of new techniques, the modification and improvement of existing ones, the installation of modern devices and the use of new technologies have improved the effectiveness and safety that was initially established for those techniques^{3,4}. There is no doubt that this has been a leap forward in the quality of care and the survival of patients with ischemic heart disease.

Cardiovascular risk factors (CVRF) are biological characteristics that increase the likelihood of developing the disease in those individuals who have them. The major CVRF are those which have been demon-

strated to have a quantifiable independent causal role, showing a strong association with cardiovascular disease and a high prevalence in the population⁵.

Because of their population impact, it is necessary to prioritize interventions on those CVRF that are more prevalent and modifiable; and whose correction has been shown to decrease to a greater extent cardiovascular risk. Therefore, it is necessary to take into account, particularly, smoking, hypertension, dyslipidemia, diabetes mellitus, obesity and sedentary lifestyle.

The possibility of having an interventional cardiology laboratory, which has an organized system of data collection and reporting, has allowed us to conduct this study. Its objective is to characterize the frequency of modifiable risk factors in patients referred for coronary angiography in the context of an acute coronary syndrome, from Pinar del Rio province to the CIMEQ Hospital, which is the nearest center where interventional cardiology is available.

METHOD

A longitudinal, retrospective and descriptive study was conducted with patients treated at the Laboratory of Hemodynamics of the CIMEQ Hospital in Havana, Cuba, from October 1997 to August 2008.

The study population consisted of 5 297 patients who underwent coronary angiography in the specified period, of which 147 emergency cases were analyzed; those referred for emergency coronary angiography from Pinar del Rio province, with a diagnosis of acute coronary syndrome, with or without ST segment elevation.

The data were obtained from the ANGYCOR database, which records all patients that will be seen for diagnostic or therapeutic purposes at the Interventional Cardiology Department of the CIMEQ Hospital. This procedure had the consent of the institution. The variables studied included age, sex, smoking, hypertension, diabetes mellitus, hypercholesterolemia, and the number of risk factors per patient.

The information obtained was processed with the SPSS software version 13.0, and descriptive statistics was applied including percentage calculations, frequency distribution and Chi square. The data were organized in tables and graphs for better interpretation.

RESULTS

Of the 147 patients included in the study, 126 (85.7%) were patients with non-ST segment elevation myocardial infarction (NSTEMI) in any of its clinical forms, the rest were patients diagnosed with ST segment elevation myocardial infarction (STEMI). The ages in both groups ranged from 26 to 82 years, with a mean age of 56.8 ± 9.7 years.

The distribution by age group is shown in Table 1. Patients aged 50-59 and 60-69 were the most affected, and together account for 66.7% of those referred for emergency coronary angiography. It is noteworthy that there is no significant differences in distribution between the two groups (p = 0.765).

Table 1. Distribution of patients by diagnosis and age groups.

Age (Years)	NSTEMI No. (%)	STEMI No. (%)	Total Nº (%)
≤30	1 (0,8)	1 (4,8)	2(1,4)
30-39	5 (4,0)	0 (0,0)	5 (3,4)
40-49	30 (23,8)	4 (19,0)	34 (23,1)
50-59	38 (30,2)	7 (33,3)	45 (30,6)
60-59	45 (35,7)	8 (38,1)	53 (36,1)
70-79	6 (4,8)	1 (4,8)	7 (4,8)
≥ 80	1 (0,8)	0 (0,0)	1 (0,7)
Total	126 (100)	21 (100)	147 (100)

The males accounted for 75.5% of cases (Figure 1), and predominated in both groups. The comparative analysis of this distribution did not showed any significant differences either (p = 0.085).

When analyzing some modifiable risk factors (Table

Table 2. Modifiable coronary risk factors.

Risk factors	NSTEMI (n=126) Nº (%)	STEMI (n=21) Nº (%)	p
Dyslipidemia	36 (23,8)	6 (28,6)	0.638
Hypertension	81 (64,3)	12 (57,1)	0.530
Smoking	60 (47,6)	13 (61,9)	0.225
Diabetes	11 (11,9)	4 (19,0)	0.366

2), it is interesting that arterial hypertension and smoking are the most prevalent ones in both groups; the former predominated in NSTEMI and the latter was more frequent in the group that experienced STEMI. There was no statistically significant difference in any of the four risk factors discussed.

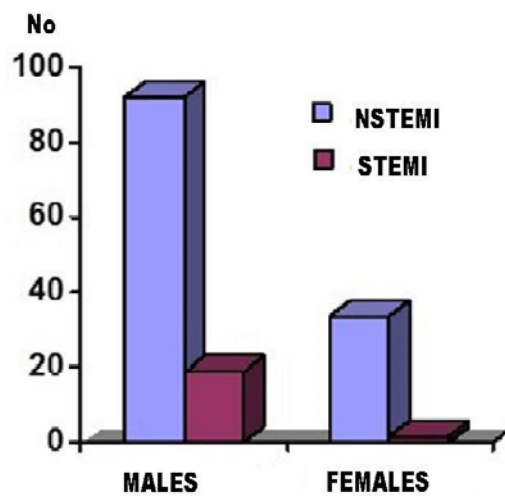


Figure 1. Distribution of groups according to sex.

The accumulation of risk factors is interesting, since it is noteworthy that 89.1% of patients (if you add up the percentages) had 2 or more risk factors, most had three (29.9%), and only one patient in the entire series did not have any of the risk factors studied in this research (Table 3).

Table 3. Number of risk factors per patient.

Nº of CVRF	NSTEMI Nº (%)	STEMI Nº (%)	Total Nº (%)
None	1 (0,8)	0 (0,0)	1 (0,7)
One	13 (10,3)	2 (9,5)	15 (10,2)
Two	31 (24,6)	4 (19,0)	35 (23,8)
Three	39 (31,0)	5 (23,8)	44 (29,9)
Four	31 (24,6)	5 (23,8)	36 (25,5)
Five	10 (7,9)	5 (23,8)	15 (10,2)
Six	1 (0,8)	0 (0,0)	1 (0,7)
Total	126 (100)	21 (100)	147 (100)

DISCUSSION

Our results are consistent with most of the reviewed series, where the age of patients is close to the sixth decade of life, and it has been noticed that ischemic heart disease is being diagnosed in increasingly younger patients⁵⁻⁷.

In most Cuban and international studies there is a predominance of male patients, which is a well known risk factor not only for coronary heart disease, but also for other vascular diseases⁴⁻⁸. Other studies report that most individuals had at least three risk factors⁹⁻¹⁰. In most of the published studies, smoking is the most common risk factor and its association with hypertension is very común^{2,4,6,9,10}, which agrees with the findings in our series.

The evidence about the adverse effects on health of this bad habit is overwhelming. This effect is linked to the amount of cigarettes or cigars smoked daily and duration of the smoking habit. The effects of smoking in patients with cardiovascular disease are more severe when they interact synergistically with other CVRF such as age, sex, hypertension and diabetes. It has also been shown that passive smoking increases the risk of ischemic heart disease and other diseases related to its toxic effect⁵⁻⁸.

High blood pressure is a risk factor for ischemic heart disease, heart failure, cerebrovascular disease, peripheral vascular disease and renal failure, in both men and women⁷⁻⁸.

Mortality due to ischemic heart disease and cerebrovascular accidents increases progressively and linearly from systolic-diastolic pressures as low as 115

and 75 mmHg, respectively. Furthermore, longitudinal data obtained from the Framingham study indicate that blood pressure values of 130-139/85-89 mmHg are associated with an increase of more than two times in the relative risk of cerebrovascular disease, compared with a BP < 120/80 mmHg⁹.

Currently, however, it is preferred to assess the risk through the overall cardiovascular risk, that is, when there is the likelihood that a person will have an atherosclerotic cardiovascular event within a given time⁹⁻¹⁰.

According to some authors, classical risk factors such as smoking, hypertension, dyslipidemia, diabetes, obesity, sedentary lifestyle and diet do not fully explain the differences in the prevalence of cardiovascular disease among different populations¹¹⁻¹⁶. Other markers such as triglycerides and impaired fasting glucose, may be helpful for risk stratification and the improvement of treatments that target specific populations, so they have been considered as emergent risk factors^{17,18}.

CONCLUSIONS

There was a predominance of male patients and ages between 50 and 70 years, in both types of acute coronary syndrome. Approximately 9 out of 10 patients present at least two of the classic risk factors. The most common were smoking (in STEMI) and hypertension (in the NSTEMI).

REFERENCES

1. Ministerio de Salud Pública. Anuario estadístico de salud 2010. Cuba: MINSAP; 2011.
2. Martínez MA, González CJ. Rol de la angioplastia primaria en la actualidad. Boletín educativo SOLACI. 2008;4(6):3-7.
3. Aroche Aportela R, Obregón Santos AG, Alfonso Garriga M, Padrón KM. Aterosclerosis coronaria en pacientes tratados con intervencionismo percutáneo [Internet]. 2006 [citado 7 Jul 2008]. Disponible en: http://www.sld.cu/galerias/pdf/sitios/urgencia/113_ateroesclerosis_coronariaen_pacientes_tratados_con_intervencionismo_percutaneo.pdf
4. González Fajardo I, Rojas Álvarez E, Moreno Martín G, Vargas González O, Cabrera Cabrera JR. Comportamiento de la letalidad por IMA en la unidad de cuidados coronarios del H.A.S. en el año 2004.

- Revista Universidad Médica Pinareña [Internet]. 2005 [citado 4 Feb 2012];1(1):[aprox. 4 p.]. Disponible en: <http://publicaciones.pri.sld.cu/rev-estud/rev-estud91/rev-estud911.html>
5. Al-Huthi MA, Raja'a YA, Al-Noami M, Abdul AR. Prevalence of coronary risk factors, clinical presentation, and complications in acute coronary syndrome patients living at high vs low altitudes in Yemen. *Med Gen Med* 2006;8(4):28.
 6. Ortega-Gil J, Pérez-Cardona JM. Unstable angina and non ST elevation acute coronary syndromes. *P R Health Sci J*. 2008;27(4):395-401.
 7. Wijpkema JS, Tio RA, Zijlstra F. Quantification of coronary lesions by 64-slice computed tomography compared with quantitative coronary angiography and intravascular ultrasound. *J Am Coll Cardiol*. 2006;47(4):891.
 8. Spinler SA. Managing acute coronary syndrome: evidence-based approaches. *Am J Health Syst Pharm*. 2007;64(11 Suppl 7):S14-24.
 9. Graham I, Atara D, Borch-Johnsen K, Boysen G, Burell G, Cifkova R, Dallongeville J, *et al*. Guías de práctica clínica sobre prevención de la enfermedad cardiovascular: Versión resumida. *Rev Esp Cardiol*. 2008;61(1): 82.e1-82.e49.
 10. Debs G, de La Noval R, Dueñas A, González JC. Prevalencia de factores de riesgo coronario en "10 de Octubre". Su evolución a los 5 años. *Rev Cubana Cardiol Cir Cardiovas*. 2001;15(1):15-20.
 11. Masia R, Pena A, Marrugat J, Sala J, Vila J, Pavesi M, *et al*. High prevalence of cardiovascular risk factors in Gerona, Spain, a province with low myocardial infarction incidence. REGICOR Investigators. *J Epidemiol Community Health*. 1998;52:707-15.
 12. Menotti A, Lanti M, Puddu PE, Kromhout D. Coronary heart disease incidence in northern and southern European populations: a reanalysis of the seven countries study for a European coronary risk chart. *Heart*. 2008;84(3):238-44.
 13. Artaud-Wild SM, Connor SL, Sexton G, Connor WE. Differences in coronary mortality can be explained by differences in cholesterol and saturated fat intakes in 40 countries but not in France and Finland. A paradox. *Circulation*. 1993;88(6):2771-9.
 14. Marrugat J, Solanas P, D'Agostino R, Sullivan L, Ordovás J, Cerdán F, *et al*. Estimación del riesgo coronario en España mediante la ecuación de Framingham calibrada. *Rev Esp Cardiol*. 2003;56(3): 253-61.
 15. Laguna F, Vicente I, Mostaza Prieto JM, Lahoz Rallo C, Taboada M, Echániz A, García Iglesias F, *et al*. La aplicación de las tablas del SCORE a varones de edad avanzada triplica el número de sujetos clasificados de alto riesgo en comparación con la función de Framingham. *Med Clin (Barc)*. 2005;124(13): 487-90.
 16. Pyörälä K. Assessment of coronary heart disease risk in populations with different levels of risk. *Eur Heart J*. 2000;21:348-50.
 17. Barrios V, Gómez-Huelgas R, Rodríguez R, Pablos-Velasco P. Adiponectina, un factor de riesgo cardiovascular emergente. Estudio REFERENCE. *Rev Esp Cardiol*. 2008;61(11):1159-67.
 18. Organización Mundial de la Salud y la Sociedad Internacional de Hipertensión. Prevención de las enfermedades cardiovasculares. Guía de bolsillo para la estimación y el manejo del riesgo cardiovascular [Internet]. Ginebra: OMS; 2008 [citado 6 Feb 2009]. Disponible en: http://www.who.int/publications/list/cadio_pocket_guidelines/es/index.html