

Global cardiovascular risk in a neighborhood of the Cárdenas Municipality, Táchira State, Venezuela

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Acronym

GCR: global cardiovascular risk

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ABSTRACT

Introduction: The coronary heart disease and its thrombotic complications are the main cause of morbidity and mortality in developed societies. The stratification of cardiovascular risk, through scales, is a fundamental pillar for therapeutic decisions in cardiovascular prevention.

Objectives: To determine the behavior of global cardiovascular risk in people over 60 years old.

Method: Cross-sectional descriptive observational study with 152 patients belonging to the population of the Monseñor Briceño neighborhood of Cárdenas municipality, Táchira State, Venezuela; who were evaluated in the period from February 2010 to April 2011. There were followed the criteria of the prediction charts of global cardiovascular risk established by the World Health Organization. Demographic and clinical variables were evaluated. The descriptive ones were expressed in percentages and the comparison between two variables was carried out with the Chi-square non-parametric statistical method with a significance level of 0.05.

Results: A 65.79% of the individuals studied were female and 51.97% were between 60-69 years of age. The high blood pressure (58.55 %) and total cholesterol levels greater than 6 mmol/L (55.26%) prevailed among the cardiovascular risk factors. A 47.37% of the individuals presented moderate risk.

Conclusions: The moderate global cardiovascular risk prevailed, which was higher in people of 70 years of age and older. High blood pressure, diabetes mellitus and hypercholesterolemia were the modifiable risk factors most associated with the increased of the global cardiovascular risk.

Key words: Risk factors, Risk assessment, Cardiovascular diseases, Venezuela

Riesgo cardiovascular global en un barrio del municipio Cárdenas, Estado Táchira, Venezuela

RESUMEN

Introducción: La enfermedad cardíaca coronaria y sus complicaciones trombóticas constituyen la mayor causa de morbilidad y mortalidad en las sociedades desarrolladas. La estratificación del riesgo cardiovascular mediante escalas es un pilar fundamental para tomar decisiones terapéuticas en prevención cardiovascular.

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Objetivo: Determinar el comportamiento del riesgo cardiovascular global en personas mayores de 60 años de edad.

Método: Estudio observacional descriptivo de corte transversal con 152 personas pertenecientes a la población del barrio Monseñor Briceño del municipio Cárdenas, Estado Táchira, Venezuela; que fueron evaluadas en el período de febrero de 2010 a abril de 2011. Se siguieron los criterios de las tablas de predicción del riesgo cardiovascular global de la Organización Mundial de la Salud. Se evaluaron variables demográficas y clínicas. Las descriptivas se expresaron en porcentajes y para la comparación entre dos variables se utilizó el método estadístico no paramétrico de Ji cuadrado con un nivel de significación de 0,05.

Resultados: El 65,79% de las personas estudiadas fueron del sexo femenino y el 51,97% tenía entre 60-69 años de edad. Entre los factores de riesgo cardiovascular predominaron la hipertensión arterial (58,55%) y las cifras de colesterol total mayores a 6 mmol/L (55,26%). Un 47,37% de las personas presentó riesgo moderado.

Conclusiones: Predominó el riesgo cardiovascular global moderado, que fue mayor en personas de 70 años y más. Las cifras elevadas de presión arterial, la diabetes mellitus y la hipercolesterolemia fueron los factores de riesgo modificables que más se asociaron con el aumento del riesgo cardiovascular global.

Palabras clave: Factores de riesgo, Medición de riesgo, Enfermedades cardiovasculares, Venezuela

INTRODUCTION

With the progressive aging of the population, cardiovascular risk factors, coronary heart disease and its thrombotic complications represent a health problem due to their high prevalence; they are the major cause of mortality and morbidity in developed societies. The stratification of cardiovascular risk through scales is a fundamental pillar for therapeutic decisions in cardiovascular prevention. The estimation of the cardiovascular risk is the most reasonable way to determine the priorities of cardiovascular prevention in asymptomatic people^{1,2}.

The global cardiovascular risk (GCR) is the probability that an individual has of acquiring a cardiovascular disease in the next 10 years, based on the number of risk factors present in the same individual or taking into account the magnitude of each of them.

In 1948, under the direction of the National Heart Institute, a project to research the origins of the cardiovascular disease was started, whose prevalence and incidence rates had been increasing in the United States since the beginning of the XX century, until it became a true epidemic. The main objective of this project was to identify the individual characteristics that contributed to the subsequent appearance of cardiovascular diseases, through the strategy of continuing its long-term development in a large group of people who had not had neither a myocardial infarction, nor cerebrovascular accidents and

who had not had symptoms attributable to these diseases^{2,3}.

Over the years, the Framingham study has led to the identification of the main cardiovascular risk factors, some with a greater or lesser weight with respect to others, according to the correlation of forces given by the circumstances and the general situation of the patient^{2,4}.

The cardiovascular risk formulas of the Framingham study have been tested in different populations and have been found to be reasonably accurate, except for areas where the incidence of the disease is low. But even in these areas, it has been possible to distinguish high-risk from low-risk people, to adjust interception, and to estimate the true absolute risk. These cardiovascular risk profiles have been considered effective in predicting the disease in the elderly as well as in middle-aged people^{3,5}.

The calculation of the GCR is necessary for the primary prevention of cardiovascular diseases. The scales derived from the Framingham study and the SCORE project⁶⁻¹⁰ for calculating cardiovascular mortality, in both cases to 10 years, are the most widely distributed in clinical practice. Multiple risk estimates have been developed from the Framingham studies^{2,4,6,10}. In 2008 were developed the tables of the World Health Organization (WHO) for the estimation and conduct to follow of the cardiovascular risk, designed for different regions of the world¹¹.

We do not know how the GCR behaves in the population under study, thus, for this research the

following question arises: How does the GCR behave in people over 60 years old in the Monseñor Briceño neighborhood of Cárdenas municipality, Táchira state? Therefore, the goal has been to determine the GCR's behavior in this population group.

METHOD

A cross-sectional descriptive observational study was conducted with all people over 60 years, belonging to the population of the Monseñor Briceño neighborhood of Cárdenas Municipality, Táchira State, Venezuela. A sample of 152 people was obtained, who were interviewed in the period from February 2010 to the beginning of 2011.

The criteria of the GCR prediction tables of the WHO were followed, specifically for the Americas region: AMR B¹¹. These indicate the risk of a serious, fatal or nonfatal cardiovascular event in a period of 10 years according to: age, sex, systolic blood pressure, smoking, total blood cholesterol and presence or absence of diabetes mellitus.

Procedures

With the collaboration of family physicians, people were cited for the consultation where the research was conducted. All of them were explained the purpose of the study and they were asked for their consent to apply the model of primary data collection, where the general matters of identity, age, sex, blood pressure figures, history of diabetes mellitus and smoking were collected.

The measurement of the blood pressure was taken according to the criteria of the seventh report on high blood pressure (JNC VII)¹². All were extracted a blood sample through cubital venous puncture for determining the total cholesterol (mmol/L).

Technique for determining the global cardiovascular risk

The tables of the WHO (Figure)¹¹ were used for the calculation of the GCR,

through the following steps:

- To select the appropriate letter according to the place of residence. In the case of Venezuela, the letters for the Americas were the ones used: AMR B.
- To select the appropriate table whether the person was or not diabetic.
- To select the appropriate table according to sex: male or female.
- To select the box according to the smoking habit. Considering a smoker who smokes regularly or who quit it in a period of one year before the survey.

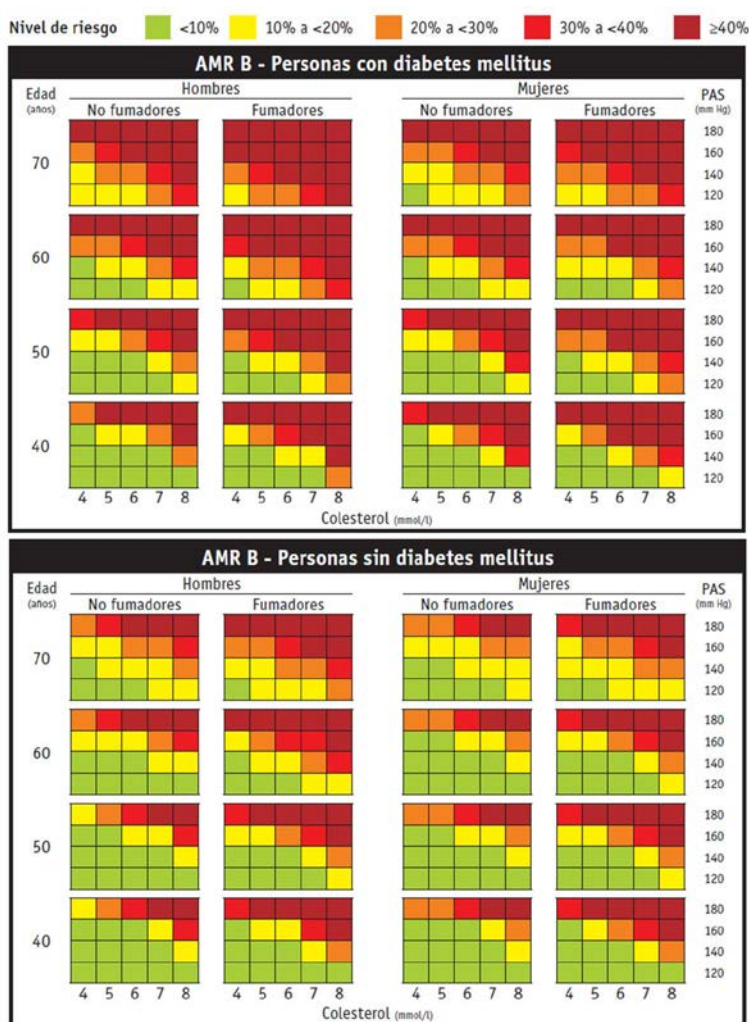


Figure. Table of WHO's risk prediction AMR B, for the contexts in which blood cholesterol can be measured. Risk of having a cardiovascular episode, fatal or not, in a period of 10 years, according to sex, age, systolic blood pressure, the total blood cholesterol, smoking and the presence or absence of diabetes mellitus. This table should only be used in the countries of the subregion B of the Americas Region of the WHO. Modified from: World Health Organization. Geneva: WHO Editions; 2008¹¹.

- To select the box according to age.
 - 40-49 years: there was selected 40.
 - 50-59 years: there was selected 50.
 - 60-69 years: there was selected 60.
 - ≥ 70 years: there was selected 70.
- To select the horizontal line that corresponded to the figure of systolic blood pressure.
 - < 140 mmHg: there was selected 120.
 - 140-159 mmHg: there was selected 140.
 - 160-179 mmHg: there was selected 160.
 - ≥ 180 mmHg: there was selected 180.
- To select in the vertical line, the box that corresponded to the figure of total blood cholesterol.
 - 3.0-4.9 mmol/L: there was selected 4.
 - 5.0-5.9 mmol/L: there was selected 5.
 - 6.0-6.9 mmol/L: there was selected 6.
 - 7.0-7.9 mmol/L: there was selected 7.
 - ≥ 8 mmol/L: there was selected 8.
- GCR, levels of risk according to the colors.
 - Level 1. Green: $< 10\%$ (Low).
 - Level 2. Yellow: 10-19,9% (Moderate).
 - Level 3. Orange: 20-29,9% (High).
 - Level 4. Red: 30-39,9% (Very high).
 - Level 5. Brown: $> 40\%$ (Extremely high).

Processing technique and analysis of information

A database was prepared in Microsoft Excel, where the data of the primary data collection model were introduced. The statistical package, Statistical Package for the Social Sciences (SPSS), version 23 for Windows was the one used.

The descriptive variables were expressed as percentages and for comparing two of them, the Chi-square non-parametric statistical method with a significance level of 0.05 was used. The results obtained were presented in a table where the information is summarized in order to address the stated objective, then, it was carried out a descriptive analysis of the studied phenomenon that allowed, through the process of synthesis and generalization, to reach to conclusions.

RESULTS

As can be observed in the **table**, from the total of studied people, 65.79% were female, with predominance of the age group between 60-69 years old (51.97%). A 47.37% presented moderate risk, higher in people from 70 to 79 years; a 32.24% of people under study were found among the high and ex-

tremely high risk levels. When analyzing the variables, age and GCR, one result statistically significant ($p = 0.022$) was found.

The male sex presented a higher percentage of cases with moderate risk (55.77%) and 22% of women presented low risk, a level that was only reached by 17.31% of men. No statistical significance appeared when the Chi-square non-parametric statistical method was used for the analysis of the variables sex and GCR.

A history of diabetes mellitus was found in 15.79% of the cases; of these, 50% were in the moderate risk level, with a statistically significant relationship in relation to the GCR ($p=0.005$). In those who did not suffer from this disease (84.21%), moderate risk (46.88 %) and low risk (23.44%) levels were predominantly found.

Smokers were scarcely represented in the sample (8.55 %), but 53.85% had moderate risk and 46.15% high to very high risk, without reaching statistical significance ($p = 0.368$).

A 41.45 % presented figures of blood pressure lower than 140 mmHg; a 36.84% of 140 to 159 mmHg and 21.71%, figures equal or higher than 160 mmHg. In general, 58.55% of those studied presented figures of systolic blood pressure above 140 mmHg. In the **table** can be observed that while the blood pressure figures increase, the cardiovascular risk increases proportionally, with a statistically significant difference ($p= 0.05$). Similarly happens with the total cholesterol, as 55.26% of those studied have total cholesterol above 6.0 mmol/L and its relationship is directly proportional to the level of GCR ($p=0.05$).

DISCUSSION

There is a marked incidence of cardiovascular diseases that increase with the advance of age, what is attributed to the progressive increase of the risk factors identified and reduced ability of the body to face them; on the other hand, age reflects the length of time of exposure to these factors, which may explain the age-independent influence found in epidemiological research of cardiovascular diseases¹²⁻¹⁶. A large number of doctors wonder if decades of exposure to cardiovascular risk factors can be counteracted in later periods of life. However, the risk factors that predispose the elderly are the same that influence the rates of middle-aged people, and there has been found that the advantages of treating blood pressure and dyslipidemia also includes the elder

Table. Global cardiovascular risk according to age group, sex, diabetes mellitus, smoking, systolic blood pressure figures and total cholesterol figures.

Variable	Global cardiovascular risk (%)						p
	< 10	10 – 19,9	20 – 29,9	30 – 39,9	≥ 40	Total	
Age groups (years)							
60 - 69	12 (15.19)	31 (39.24)	25 (31.65)	10 (12.66)	1 (1.27)	79 (51.97)	0.022
70 - 79	16 (27.59)	33 (56.90)	3 (5.17)	5 (8.62)	1 (1.72)	58 (38.16)	
≥ 80	3 (20)	8 (53.33)	2 (13.33)	2 (13.33)	0 (0)	15 (9.87)	
Sex							
Femenino	22 (22)	43 (43)	24 (24)	10 (10)	1 (1)	100 (65.79)	0.309
Masculino	9 (17.31)	29 (55.77)	6 (11.54)	7 (13.46)	1 (1.92)	52 (34.21)	
Diabetes mellitus							
Sí	1 (4.17)	12 (50)	6 (25)	3 (12.50)	2 (8.33)	24 (15.79)	0.005
No	30 (23.44)	60 (46.88)	24 (18.75)	14 (10.94)	0 (0)	128 (84.21)	
Smoking							
Sí	0 (0)	7 (53.85)	4 (30.77)	2 (15.38)	0 (0)	13 (8.55)	0.368
No	31 (22.30)	65 (46.76)	26 (18.71)	15 (10.79)	2 (1.44)	139 (91.45)	
Systolic blood pressure (mmHg)							
< 140	13 (20.63)	39 (61.90)	11 (17.46)	0 (0)	0 (0)	63 (41.45)	< 0.05
140 - 159	11 (19.64)	31 (55.36)	9 (16.07)	5 (8.93)	0 (0)	56 (36.84)	
160 - 179	7 (30.43)	2 (8.70)	7 (30.43)	6 (26.09)	1 (4.35)	23 (15.13)	
≥ 180	0 (0)	0 (0)	3 (30)	6 (60)	1 (10)	10 (6.58)	
Total	31 (20.39)	72 (47.37)	30 (19.74)	17 (11.18)	2 (1.32)	152 (100)	
Total cholesterol (mmol/L)							
3 - 4.9	7 (18.92)	21 (56.76)	9 (24.32)	0 (0)	0 (0)	37 (24.34)	< 0.05
5 - 5.9	9 (29.03)	18 (58.06)	4 (12.90)	0 (0)	0 (0)	31 (20.39)	
6 - 6.9	15 (23.08)	32 (49.23)	12 (18.46)	5 (7.69)	1 (1.54)	65 (42.76)	
7 - 7.9	0 (0)	1 (10)	3 (30)	5 (50)	1 (10)	10 (6.58)	
≥ 8	0 (0)	0 (0)	2 (22.22)	7 (77.78)	0 (0)	9 (5.92)	

Data expressed n (%)

ly¹⁷⁻²¹.

The coronary artery disease is manifested much later in women than in men, and it has a low incidence during the fertile period, with a progressive increase after menopause. This has been related to a protective effect of female sex hormones^{5,6,17}. In our research, no statistical significance has been found when comparing the sex and GCR.

The EPICARDIAN²⁰ Project found 68% of hypertensive patients, according to the criteria of pressure

values equal to or greater than 140/90 mmHg. Other studies report 50% after 50 years and 60-70% after 60 years²¹⁻²⁴; what matches with our results. In the present study, more than half of the people present hypercholesterolemia (55.26 %) according to the criteria of the NCEP (National Cholesterol Education Program)¹⁵, figures well above those found by other authors^{6,17,18}. The EPICARDIAN Project found a 26.4%²⁰.

The percentage of people with diabetes mellitus

found in the present research (15.79%) is similar to other reviewed studies^{16,18}. The EPICARDIAN Project found 13.4%²⁰. The smoking habit was found below other research (8.55%)^{6,8,16,20}. Smoking is considered responsible for 50% of avoidable deaths, half of them related to cardiovascular diseases^{6,17,20}.

In Venezuela, there were no published studies on GCR in the elderly; in ours, the low GCR is represented only by a 20.39%, well below other having higher percentages^{8,10,14,18,19}.

Cardiovascular diseases are at the highest level of morbid processes that affect elderly patients. The GCR assessment is the most appropriate method for addressing these diseases. Once the risk is known, it is possible to act on the modifiable risk factors and prevent the prognoses from being fulfilled.

CONCLUSIONS

A predominance of the moderate global cardiovascular risk was found. People aged 70 years and over presented greater risk. The high blood pressure, diabetes mellitus and hypercholesterolemia are the modifiable risk factors most associated with the increased global cardiovascular risk.

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