

# Prevalence of Risk Factors in Patients Consulting During the “Cardiovascular Prevention Week” in a University Hospital

## *Prevalencia de factores de riesgo en los concurrentes a la “Semana de la prevención cardiovascular” en un hospital universitario*

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### ABSTRACT

**Introduction:** Despite pharmacological and non-pharmacological measures, the prevalence of cardiovascular risk factors (CRFs) continues to increase.

**Objective:** The aim of this study was to evaluate the level of cardiovascular risk in the population usually consulting at the Division of Cardiology of Hospital de Clínicas José de San Martín, in order to carry out a sampling of reliable epidemiological data.

**Methods:** This is a descriptive, comparative, cross-sectional study of consecutive individuals who spontaneously consulted during the “Cardiovascular Prevention Week” in September 2015.

**Results:** A total of 497 individuals were included in the study. There was high prevalence of CRFs, with poor achievement of blood pressure, blood glucose and total cholesterol goals. Overweight revealed alarming rates. The prevalence of subclinical atheromatosis was proportional to the individual cardiovascular risk.

**Conclusions:** The data collected suggest the need for cardiology areas of primary cardiovascular prevention, with objectives focused on the estimation of cardiovascular risk and patient adherence through education.

**Key words:** Risk assessment - Atherosclerosis - Primary prevention

### RESUMEN

**Introducción:** A pesar de las medidas farmacológicas y no farmacológicas, la prevalencia de factores de riesgo cardiovascular (FRCV) continúa en aumento.

**Objetivo:** Evaluar el nivel de riesgo cardiovascular de la población que habitualmente concurre a la División de Cardiología del Hospital de Clínicas José de San Martín, a fin de realizar un muestreo con datos epidemiológicos confiables.

**Material y métodos:** Estudio descriptivo y comparativo de corte transversal, en individuos consecutivos que concurren de manera espontánea durante la “Semana de la Prevención Cardiovascular” en septiembre de 2015.

**Resultados:** En un total de 497 individuos se encontró una elevada prevalencia de FRCV, con pobre alcance de las metas de presión arterial, glucemia y colesterol total. El sobrepeso arrojó valores alarmantes. La prevalencia de aterosclerosis subclínica fue proporcional al riesgo cardiovascular del individuo.

**Conclusiones:** Los datos recabados sugieren la necesidad de contar con áreas cardiológicas de prevención cardiovascular primaria, cuyos objetivos se centralicen en la estimación del riesgo cardiovascular y la adherencia del paciente a través de su educación.

**Palabras clave:** Medición de riesgo - Aterosclerosis - Prevención primaria

### INTRODUCTION

Atherosclerosis is the leading cause of death worldwide. Despite pharmacological and non-pharmacological measures, the prevalence of cardiovascular risk factors (CRFs) continues to increase. The Division of Cardiology of Hospital de Clínicas José de San Martín (HCJSM) has developed strategies to collect a greater number of high-quality data through the review of medical records.

The prevalence of CRFs, the usefulness of different cardiovascular risk (CVR) scores, and the adher-

ence to treatment were obtained, and publications and comparisons with national and international registries were performed. A cardiovascular prevention campaign open to the community was carried out with the aim of describing and comparing: 1) Clinical, anthropometric, and CVR characteristics of the participant population, and their correlation with subclinical atherosclerosis; 2) Gender differences; 3) Prevalence of left ventricular hypertrophy (LVH) and its correlation with carotid plaque; 4) The degree of blood pressure, total cholesterol and blood glucose control;

REV ARGENT CARDIOL 2018;86:271-274. <http://dx.doi.org/10.7775/rac.v86.i4.11973>

Received: 03/15/2018 – Accepted: 05/18/2018

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5) Knowledge of vaccines for primary and secondary prevention, and; 6) Association between subclinical atheromatosis and the CVR prediction score used.

## METHODS

This was a descriptive, comparative, cross-sectional study including consecutive individuals who spontaneously went for consultation to HCJSM during the “Cardiovascular Prevention Week”, in September 2015. The inclusion criteria were both sexes, age 30 to 75, and at least 12-hour fasting. A circuit was carried out where cardiologists evaluated the CRFs; anthropometric measurements (body mass index, abdominal circumference and waist-hip ratio); blood pressure measurement (average of two blood pressure readings taken 3 minutes apart in the same upper limb); monitoring of total cholesterol and blood glucose; electrocardiogram; and color Doppler ultrasound of neck vessels to identify carotid plaque in patients >45 years of age or, with at least 1 CRF, namely: high blood pressure (HBP), hypercholesterolemia or hyperglycemia known or detected during the evaluation, smoking (SMK) and obesity.

Patients were classified according to the World Health Organization (WHO) 10-year CVR tables as low (<10%), moderate (10-20%) and high risk (>20%). Participants who were candidates for secondary prevention (coronary heart disease, peripheral vascular disease, previous stroke or transient ischemic attack) were included in the high-risk group. In addition, the population was divided into age tertiles to correlate with subclinical atherosclerosis.

For the statistical analysis, continuous variables were expressed as mean and standard deviation and qualitative variables, as percentage and interquartile range. Qualitative variables were compared using the chi square test. For the analysis of factors associated with the presence of carotid plaque, a logistic stepwise regression model was used, selecting the variables with significant associations. A p value <0.05 was considered statistically significant.

## ETHICS CONSIDERATIONS

All participants signed the informed consent to perform the evaluations in accordance with the “Declaration of Helsinki” in its latest version (Fortaleza, 2013) and the “National Data Protection Act”. A copy of the

results together with medical recommendations was provided to all subjects.

## RESULTS

Among all the individuals who presented to consultation, 497 met the inclusion criteria. Mean age was  $55.6 \pm 11$  years. Table 1 shows the prevalence of CRFs. There was a significant difference in the prevalence of subclinical atherosclerosis between the subgroups analyzed according to age (OR=3.88 for over-60 years, 95% CI=2.46-6.39,  $p < 0.0001$ ) and hypertension (OR=2.9, 95% CI=1.69-4.27,  $p < 0.0001$ ). (Figure 1)

According to WHO charts, the 10-year global risk stratification was: Low, 64.2%, Moderate, 18.8% and High, 17%. Among the total number of women, 68.7% were at low risk, 16.6% at moderate risk and 14.6% at high risk. Among the total number of men, 57.7% were at low risk, 21.9% at moderate risk and 20.4% at high risk. According to CVR, plaque was found in 21% of low risk, 48.2% of moderate risk, and 56% of high risk individuals.

Table 2 shows the scope of anthropometric and CRF goals. The overall mean body mass index (BMI) was 29.2 (95% CI=28.7-29.8). A total of 56.9% participants had BMI >29.9, and were considered obese.

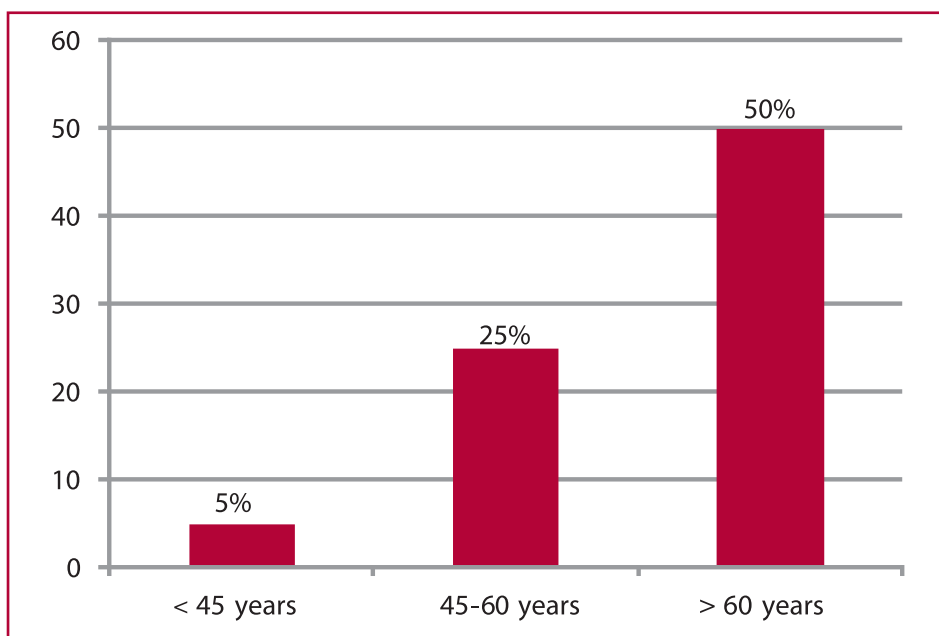
In the electrocardiographic recording, 16 participants presented LVH, 43.7% correlating with atherosclerotic plaque in the Doppler ultrasound of neck vessels.

The rate of influenza vaccine knowledge and administration in the last 12 months was 80.3% and 22.8%, respectively, and of pneumococcal disease vaccine 40.7% and 7.9%, respectively. Thirty percent and 21% of participants who were candidates for secondary prevention received influenza and pneumococcal vaccines, respectively.

Finally, a logistic regression model identified five factors independently associated with atherosclerotic plaque: BMI, history of hypertension, age, systolic blood pressure  $\geq 140$  mm Hg, and fasting blood glucose  $\geq 110$  mg/dl.

CRF	n	%	95% CI
Male subjects	202	40.6	
Hypertension	189	38	33.7 - 42.3
Hypercholesterolemia	162	32.6	28.5 - 36.7
Ex SMK	159	32	27.9 - 36.1
SMK	57	11.5	8.6 - 14.3
Diabetes mellitus	49	9.9	7.2 - 12.5
Primary prevention		94	
<b>Secondary prevention</b>			
Peripheral vascular disease	14	2.8	1.4 - 4.3
Stroke/TIA	10	2	0.8 - 3.3
Renal failure	5	1	0.1 - 1.9

**Table 1.** Cardiovascular risk factors prevalence

**Fig. 1.** Association between carotid plaque and age**Table 2.** Achievement of cardiovascular risk factors and anthropometric goals

Variable	%	cm	kg
BMI <30	43.1		
Scope / Mean waist circumference (men)	45.5	102	
Scope / Mean waist circumference (women)	48.8	93.4	
Global weight			78.5
- male			87.4
- female			72.4
Global height		162.5	
- male		171.4	
- female		156.3	
Blood pressure	33.5		
Total cholesterol	35.1		
Glycemia	59.2		

BMI: Body mass index.

## DISCUSSION

The evaluation of CVR in asymptomatic individuals with risk factors for cardiovascular disease, particularly those at low or intermediate risk, remains a challenge. No score is perfect and hence, different strategies have been developed: 1) calculation of vascular age or risk scores at 30 years (1, 2); 2) biomarkers that improve the predictive power of a model based on traditional risk factors (3); and 3) detection of subclinical carotid atherosclerosis –or in another vascular territory– using imaging studies. (4)

In 2006, in Argentina, Christen et al. published that every other patient considered to be at low risk by different risk tables underwent restratification due to subclinical atheromatosis. The prevalence of carotid plaque detected in this study is lower than that in Christen's work (32% versus 57%), but in line with other international publications. In view of the above,

we found that 48.2% of individuals at intermediate WHO risk presented plaque, which would place them in a higher risk category, as proposed by the SCORE evaluation system of the European Society of Cardiology. (5)

The "Update of the Consensus on Cardiovascular Prevention" (6) recommends the use of any risk score. In our analysis, we have divided the population according to the WHO score –which is the only score that includes data from Argentina, located in region B of the Americas–, composed of variables that are measurable in the context of a prevention campaign. (7, 8)

Compared to the CARMELA study, our study reported higher prevalence of hypertension, hypercholesterolemia, diabetes, and carotid plaque. Something we share with other countries in the Southern Cone is the high prevalence of CRFs, confirming the epidemic of cardiovascular disease without effective medical intervention. (9-11)

When comparing our study with the National Reg-

istry of Hypertension (RENATA), (12) the population consulting at HCJSM presents a higher percentage of undertreatment. We have found a low percentage in the scope of target figures due to the notorious underdiagnosis and undertreatment of dyslipidemic, hypertensive, and diabetic patients. In Argentina, Masson et al. concluded that risk stratification and statin administration in a primary prevention population vary according to the risk function used, and that being aware of the plaque-scores relationship may improve risk estimation. (13)

Our research aims at continuing along that line; we have designed a predictive carotid plaque score through the analysis of five variables measurable in a medical consultation, which correlates with subclinical atheromatosis.

Regarding the prevalence of diabetes mellitus, hypercholesterolemia and ex-smoking, our data coincide with those published in the "Third National Survey of Risk Factors for Non-Communicable Diseases".

The humble scope of target figures in primary prevention populations seems to predict the poor outcomes published in secondary prevention registries. (14)

Some study limitations include the convenience –not random– sampling type with patients who consulted spontaneously, restricting its generalization to the general population. In addition, socio-economic or educational variables that can be associated with the control of CRFs were not evaluated.

## CONCLUSIONS

Diagnosing cardiovascular disease in asymptomatic individuals has turned into a chapter in Cardiology. Our findings are consistent with the national data published earlier. Some CVR indicators are directly associated with the presence of subclinical atheromatosis. This statement would allow us to recategorize a considerable number of patients to higher CVR, and also select different profiles of patients who are candidates to statins, and others, who would not benefit from a Doppler ultrasound of neck vessels.

## Conflicts of interest

None declared. (See authors' conflicts of interest forms on the website/Supplementary material).

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