# (Lack of) control of clinical and anthropometrical parameters in individuals with coronary artery disease*

## (DES)CONTROLE DE PARÂMETROS CLÍNICOS E ANTROPOMÉTRICOS EM INDIVÍDUOS COM DOENÇA ARTERIAL CORONÁRIA

## (DES)CONTROL DE PARÁMETROS CLÍNICOS Y ANTROPOMÉTRICOS EN INDIVIDUOS CON ENFERMEDAD ARTERIAL CORONARIA

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**ABSTRACT**

This cross-sectional study evaluated the clinical and anthropometrical parameters of 100 individuals with coronary artery disease, who were assisted at preventive cardiology outpatient clinic at a public hospital in Salvador/BA. Data collection was performed through interviews and both clinical and laboratory evaluations. The results were analyzed as averages and percentages. Most participants were black men, aged <60 years, married, low education level and small income, unemployed and diagnosed with myocardial infarction. Most reported having arterial hypertension, dyslipidemia, a sedentary lifestyle, and had quit smoking and drinking. All women and 82% of the men had an increased abdominal circumference, 19% had causal blood glucose>200 mg/dL, 36% was overweight, 28% were obese, 65% were in soma stage of hypertension, 65% had low HDL-C and 43% had high total cholesterol. It was observed that individuals with high cardiovascular risk and deficient socioeconomic conditions show a lack of control of several cardiovascular risk factors, thus demanding effective health care practices to control the illness.

**DESCRIPTORS**

Coronary artery disease
Risk factors
Nursing

**RESUMO**

Estudo de corte transversal que avaliou parâmetros clínicos e antropométricos em 100 indivíduos com doença arterial coronária, atendidos em um ambulatório de cardiologia preventiva em um hospital público, em Salvador/BA. Na coleta de dados empregou-se entrevista, avaliação clínica e laboratorial. Os resultados foram analisados em médias e percentuais. Predominou homens, faixa etária <60 anos, raça/cor negra casado(a)s, baixa escolaridade e renda, indivíduos sem ocupação e com diagnóstico de infarto do miocárdio. A maioria relatou hipertensão arterial, dislipidemia, sedentarismo, abandono do tabagismo e da bebida alcoólica. Todas as mulheres e 82% dos homens tinham circunferência abdominal aumentada, 19% glicemia casual >200 mg/dL, 36% sobrepeso, 28% obesidade, 65% algum estágio de hipertensão arterial, 65% HDL-C baixo e 43% estava com colesterol total alto. Em indivíduos de alto risco cardiovascular e condições socioeconômicas deficitárias constatou-se o descontrole de vários fatores de risco cardiovascular, demandando práticas de cuidar efetivas para o controle da doença.

**DESCRITORES**

Doença da artéria coronariana
Fatores de risco
Enfermagem

**RESUMEN**

Estudio transversal que evaluó parámetros clínicos y antropométricos en 100 individuos con enfermedad arterial coronaria atendidos en ambulatorio de cardiología preventiva en hospital público en Salvador/BA. Para recolección de datos se utilizó entrevista, evaluación clínica y laboratorial. Los resultados fueron analizados con medias y porcentuales. Predominio de hombres, faja etaria <60 años, raza/color negra, casados/as, baja escolaridad e ingresos, individuos desocupados con diagnóstico de infarto de miocardio. La mayoría presentó hipertensión arterial, dislipidemia, sedentarismo, abandono de tabaquismo y de bebidas alcohólicas. Todas las mujeres y 82% de hombres tenían circunferencia abdominal aumentada, 19% glucemia casual >200 mg/dl, 36% sobrepeso, 28% obesidad, 65% algún estado de hipertensión arterial, 65% HDL-C bajo y 43% colesterol total alto. En individuos de alto riesgo cardiovascular y condiciones económicas deficitarias, se constató descontrol de varios factores de riesgo, demandando prácticas de cuidado efectivo para el control de la enfermedad.

**DESCRIPTORES**

Enfermedad de la arteria coronaria
Factores de riesgo
Enfermería

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## INTRODUCTION

Cardiovascular diseases (CVD) are responsible for more than 1/3 of deaths in Brazil[1] and projections for these diseases in 2020 appoint that they will continue heading lethality statistics[2].

Coronary artery and cerebrovascular diseases are the main types, corresponding to 80% of CVD deaths[3]. They are due to different factors, ranging from the person's genetics, age, gender and life habits to lack of control of cardiovascular risk factors (CVRF) related to atherosclerosis[2]. The more of these factors are associated in a person, the greater the probability of developing the disease. Hence, their prevention and control is a powerful weapon to reduce CVD morbidity and mortality[4].

A large international study called *INTERHEART*[4] for the first time assessed CVRF in 52 countries across the five continents, including Brazil. It was verified that nine risk factors, which are simple to detect and can be modified, are responsible for more than 90% of attributable CVD risk, six of which increase (dyslipidemia, arterial hypertension, diabetes mellitus, overweight/obesity, smoking, psychological stress) and three decrease the risk (regular physical exercise, adequate vegetable and fruit intake and alcohol consumption in small to moderate doses). In the AFIRMAR study[5], carried out in Brazil, the findings were practically identical. These data evidence that predisposition to atherosclerotic disease in Brazil is similar to what is observed in other countries, and that CVRF control is fundamental to prevent and control the disease.

...nine risk factors, which are simple to detect and can be modified, are responsible for more than 90% of attributable cardiovascular diseases risk...

Industrialization, urbanization, economic development and globalization processes have stimulated the adoption of behaviors that are harmful for health. Many of the habits related to food, physical exercise, smoking and alcohol consumption are incorporated at a young age and favor the appearance or worsening of biological cardiovascular risk factors that can be reverted, such as arterial hypertension and obesity[6]. Today, overweight for example represents the main CVD risk factor, not only as a primary causal factor, but also as a generator of the main causal factors: hypertension, dyslipidemia and diabetes.

Studies appoint that socioeconomic variables like income, education and housing conditions are negatively correlated with CVD mortality[7-8]. People with lower education levels have less knowledge on chronic illness prevention and the search for health services due to preventive reasons is greater in the population with better purchasing power, while visits due to diseases are more frequent among poorer people[8].

In this sense, the poorest population groups with the lowest education levels particularly are the most vulnerable to CVRF, appointing the need for efficient prevention and control actions. This entails the great challenge clients, health professionals and public authorities need to face.

The importance of CVRF control and, consequently, of reducing the combined CVD morbidity and mortality profile, especially lack of knowledge on these factors and their degree of control in coronary artery disease (CAD) patients living in situations of social inequality, who were attended at an cardiology outpatient clinic of a public hospital, led to the need to assess clinical and anthropometric parameters in people at high cardiovascular risk. The assessment of these parameters provides support to direct interdisciplinary care practices for prevention and control purposes.

## OBJECTIVE

To assess clinical and anthropometric parameters in coronary artery disease patients.

## METHOD

### *Study design and place*

Cross-sectional, descriptive and exploratory research, carried out at an outpatient clinic of a state hospital located in Salvador-BA, which serves as a referral institution for high-complexity cardiology care to Unified Health System (SUS) users.

### *Sample*

The sample comprised adult and elderly patients, i.e. older than 18 years, male and female, oriented in time and space, registered at the outpatient clinic, with a medical diagnosis of acute myocardial infarction (AMI) (ICD - I21.9) or unstable angina (UA)(ICD - I20.0) and who agreed to sign the Informed Consent Term.

To calculate the sample size (n), the estimated prevalence of AMI was used as a parameter, which corresponds to 99/100,000 adults in Salvador/BA[9]. The following parameters were also considered to calculate the sample:

$$n = \frac{NP(1-P)}{(N-1)\,D + P\,(1-P)} \quad \text{where, } D = \frac{B^2}{Z_{\alpha/2}} \text{ and } B = 1-\alpha P$$

$N$ - total number of assumed population during data collection period = 1,000; $P$ - proportion of the study population = 0.099; $n$ - sample size; $\alpha$ -significance level; (1–$\alpha$)100 - confidence level; $B$ - ewanted estimated maximum error; $Z_{\alpha/2}$=1,96; 1–$\alpha$=0,95; B = 0,04 or 4%. According to the calculation, the size of the sample would be 99, but the sample contained 100 persons.

***Data collection***

The data collection instrument included three parts. The first contained closed questions on socioeconomic data and the second on referred personal and family antecedents of CVRF. The third comprised items to register clinical and anthropometric data (blood pressure, weight, height, abdominal circumference, body mass index) and laboratory test results (casual capillary glucose, total cholesterol and HDL-C).

Approval for the project was obtained from the Institutional Review Board of the Bahia State Health Secretary (protocol No 219/2008), in compliance with National Health Council Resolution No 196/96[10].

The adequacy of the data collection instrument for the study was tested. Data were collected between March and July 2008.

After confirming the medical diagnosis of CAD in the patient files of people who were going to attend or had attended a medical consult, they were contacted at the waiting room of the clinic and received in a private room to get further explanation about the research. After they had agreed to participate in the study and signed the informed consent term, the interview started to identify socioeconomic data and personal and family antecedents of CVRF. Next, clinical and anthropometric parameters were assessed and, family, participants were forwarded for lipid profile collection at the laboratory of the research institution.

All clinical and laboratory assessment results were made available to participants as well as the medical team. In case of high pressure levels (systolic pressure above 140 mmhg and diastolic pressure above 90), and/or casual capillary glucose above 200 mg/dL, the participant's physician was informed to assess the patient.

The following procedures were adopted for clinical and anthropometric assessment purposes:

*a) Blood pressure measurement*

Blood pressure was measured twice, at a one-minute interval, and the average was considered[11]. Patients were advised not to talk and/or not to keep their legs crossed during the measurement. It was certified that they were not on a full bladder; had not practiced physical exercise within 90 minutes and had not drunk coffee, eaten or smoked within 30 minutes before the measurement. Blood pressure was measured in a calm environment, in a private room, at a pleasant temperature, using an OmronHEM 705 CP dive. This is a digital electronic arm blood pressure measurement device, with automatic air inflation and deflation, in which the pulse pressure and wave are detected through a capacitance pressure transducer. The equipment was assessed according to the validation standards required by the British Hypertension Society (BHS)[12].

Pressure was measured in the sitting position, with the upper left limb resting at the height of the heart, undressed, with the hand palm turned upwards and elbow slightly flexed. The cuff was placed at about 2 to 3 cm above the cubital fossa and the rubber bag centralized on the brachial artery. The size of the rubber bag corresponded to 40% of the arm circumference and the length involved at least 80%. The V Brazilian Arterial Hypertension Guideline's blood pressure assessment and classification parameter was adopted[11].

*b) Determination of anthropometric measures*

Weight (in kilograms) was determined through Techline TEC 30 digital scales, with Inmetro verification, 0.1Kg variation, maximum capacity 150 Kg and minimum 2.5KG. Height (in meters) was determined through an Alturexta portable stadiometer linked to a base. To determine the patient's weight, the person was asked to wear light clothes, without shoes and stand with his/her back turned towards the scales' display. After measuring the weight, the patient's height was checked with the stadiometer's wooden rod, marking 0.5 cm intervals. These two variables were used to determine the body mass index (BMI), whose formula is the index between weight in kilograms and squared height in meters (BMI = weight/height$^2$). The BMI was assessed according to WHO criteria[13].

*c) Determination of abdominal circumference*

To determine the abdominal circumference, the patient was asked to stand up, breathe normally, uncovering the abdominal region. The AC was measured at the middle point between the lower rib and the iliac crest, using a 1.5m flexible, non-extendable metric tape with 0.5cm intervals. This parameter was assessed according to Brazilian[14-15] and international[16] criteria.

*d) Determination of lipid and glucose profile*

For capillary glucose dosage purposes, a capillary puncture was done in the patient's index finger, after skin antisepsis with 70% alcohol, using an appropriate lancet. The blood droplet was applied on the test trip and an Accutrend portable monitor was used for glucose measurement. As the glucose collection was casual, the time of the last meal was registered and levels were classified according to the Brazilian Diabetes Consensus[17], which considered casual glucose levels =200 mg/dL as suspected signs of Diabetes Mellitus. Blood collection for total and HDL-C cholesterol measurement was done at the laboratory on the same occasion, as the participants were already present. Both parameters were classified according to the IV Brazilian Dyslipidemia Guideline[18].

***Data treatment and analysis***

Based on the data registered and coded in the forms, a database was elaborated in SPSS 13.0 for Windows. Results were analyzed as percentages and averages and presented in tables and graphs.

## RESULTS

### *Socioeconomic and clinical characteristics*

Table 1 shows the predominance of the male gender (56.0%), coming from Salvador (72.0%), mean age 58.7±10.9 years (58.5 ± 10.9 years for men and 58.9 ± 11.3 for women), with a majority younger than 60 years (54.0%). Most participants declared themselves mulatto or black (84.0%), lived with a partner (52.0%), had a low education level (87.0%) and income (82.0%), did not have an occupation due to retirement or unemployment (68.0%) and had between 1 and 3 dependents (56.0%). Half of the participants were first attended at the place of study in 2007, 40.0% in 2008 and 10.0% in 2006.

**Table1 -** Participants according to socioeconomic data - Salvador, BA - 2008

| Personal antecedents of cardiovascular risk factors | n | % |
|---|---|---|
| **Arterial Hypertension (n=100)** | | |
| Yes | 94 | 94 |
| No | 6 | 6 |
| **Type 2 Diabetes Mellitus (n=100)** | | |
| Yes | 35 | 35 |
| No | 63 | 63 |
| Does not know | 2 | 2 |
| **Blood lipid alteration (n=100)** | | |
| Yes | 83 | 83 |
| No | 9 | 9 |
| Does not know | 8 | 8 |
| **Overweight (n =100)** | | |
| Yes | 48 | 48 |
| No | 51 | 51 |
| Does not know | 1 | 1 |
| **Smoking (n=100)** | | |
| Yes | 4 | 4 |
| No | 37 | 37 |
| Former smoker | 59 | 59 |
| **Drinking (n=100)** | | |
| Yes | 23 | 23 |
| No | 26 | 26 |
| Former drinker | 51 | 51 |
| **Sedentariness (n=100)** | | |
| Physical exercise < 3x p/ week | 5 | 5 |
| Physical exercise 3-5x p/ week at least 30' | 16 | 16 |
| Physical exercise >5x p/ week at least 30' | 3 | 3 |
| Does not practice physical exercise | 76 | 76 |
| **Menopause (n=44*)** | | |
| Yes | 32 | 32 |
| No | 10 | 10 |
| Does not know | 1 | 1 |
| Hysterectomy | 1 | 1 |
| **Clinical characteristics for CAD (n=100)** | | |
| Chest angina | 18 | 18 |
| Acute Myocardial Infarction (AMI) | 82 | 82 |
| **Diagnosis time of Unstable Angina (n=18)** | | |
| ≤1year | 14 | 77.8 |
| 2-3 years | 3 | 16.7 |
| ≥4 years | 1 | 5.5 |
| **Diagnosis time of most recent AMI (n=82)** | | |
| ≤1year | 54 | 65.8 |
| 2-3 years | 15 | 18.3 |
| ≥4 years | 13 | 15.9 |

† Does not know how to read and write, can only write his/her name; *Minimum wage in 2008: R$ 415 (four hundred and fifteen *reais*); ** Metropolitan Region, includes the following cities: Camaçari, Candeias, Dias d'Ávila, Itaparica, Lauro de Freitas, Madre de Deus, Mata de São João, São Francisco do Conde, São Sebastião do Passé, Simões Filho, Vera Cruz.

### *Characterization of clinical manifestation of CAD and reference to CVRF*

Most participants received a medical diagnosis of AMI (82.0%). Independently of the type of coronary event, more than two thirds of the sample had received this diagnosis less than one year before. Out of 90 patients registered at the place of study in 2007 and 2008 (Table 1), 64 had suffered the most recent coronary event less than one year earlier, picturing that the period when the event occurred seems to coincide with the period when they were attended at the outpatient clinic.

Frequency levels for references of personal risk antecedents were high, particularly arterial hypertension (94.0%), dyslipidemia (83.0%), sedentariness (76.0%) and menopause in 72.7% of the women (32 out of 44), as shown in Table 2. Levels below 50.0% refer to overweight (48.0%) and diabetes mellitus (35.0%). The 24 participants who practiced physical exercise walked, 19 of them more than three times per week for at least thirty minutes.

**Table 2 -** Participants according to clinical characteristics of CAD and reference to CVRF - Salvador, BA - 2008

| Variables | n % - 100 |
|---|---|
| **Gender** | |
| Male | 56 |
| Female | 44 |
| **Age** | |
| < 50 years | 22 |
| 50 – 60 years | 32 |
| ≥ 60 years | 46 |
| **Self-declared race/color** | |
| White | 16 |
| Black | 21 |
| Mulatto | 63 |
| **Marital status** | |
| With partner (married or fixed partner) | 52 |
| Without partner (single, widowed or divorced) | 48 |
| **Education** | |
| Illiterate† | 34 |
| Primary education – year 1 | 53 |
| Primary education – year 2 | 8 |
| Primary education – year 3 | 5 |
| **Employment situation** | |
| Employed | 32 |
| Unemployed | 68 |
| **Family income (in minimum wages*)** | |
| ≤ 1 wage | 35 |
| 1-2 wages | 47 |
| ≥ 3 wages | 18 |
| **Number of dependents** | |
| 1-3 people | 56 |
| 4-6 people | 39 |
| > 6 people | 5 |
| **Number of children** | |
| ≤ 3 | 48 |
| 4-6 | 34 |
| > 6 | 18 |
| **Place of residence** | |
| Salvador | 72 |
| Metropolitan Region** | 5 |
| Other cities in Bahia | 23 |
| **Year of 1st attendance at place of study** | |
| 2006 | 10 |
| 2007 | 50 |
| 2008 | 40 |

*56 participants were men

Risk antecedents were also reported for more than 50% of first-degree relatives: hypertension (84.0%), obesity (59.0%), dyslipidemia (59.0%) and type 2 diabetes mellitus (56.0%). Frequent reference was also made to cerebrovascular accident (49.0%), AMI (64.0%) and UA (50.0%).

Table 3 shows the study participants' characteristics according to clinical and anthropometric indicators. Normal blood pressure was observed in only 20.0%, while 65.0% displayed hypertension, equally distributed among stages I to II. Overweight was observed in 64%, 28% of whom were obese. According to the mean abdominal circumference, central obesity was identified in 100.0% of women and 82.1% of men, totaling 90.0% of the sample. Casual glucose >200mg/dl was detected in 19.0%, all of whom had a previous medical diagnosis of diabetes mellitus. It is highlighted that none of the participants had been fasting for eight hours or more. Regarding lipids, high total cholesterol was observed in 43.0% of participants, and low serum levels of HDL-C in more than half (65%).

**Table 3 -** Characterization of study participants' clinical and anthropometric parameters - Salvador, BA - 2008

| Risk factor | Total n | % |
|---|---|---|
| **Blood pressure*** | | |
| Excellent (up to 120X80) | 11 | 11 |
| Normal (120 – 130 X 80 – 85) | 9 | 9 |
| Borderline (130 – 139 X 85 – 89) | 15 | 15 |
| Stage I hypertension (140 – 159 X 90 – 99) | 22 | 22 |
| Stage II hypertension (160 – 179 X 100 – 109) | 21 | 21 |
| Stage III hypertension (> 180X110) | 22 | 22 |
| **Body mass index (BMI)†** | | |
| 18 a 24.9 (Eutrophic) | 36 | 36 |
| 25 a 29.9 (Overweight or pre-obesity) | 36 | 36 |
| 30 a 34.9 (Grade I obesity) | 26 | 26 |
| 35 a 39.9 (Grade II obesity) | 2 | 2 |
| **Circunferência abdominal (CA)** | | |
| Women ≤84 cm¥ or ≤80 cm§ /Mens ≤88 cm¥ or ≤90 cm§ | 10 | |
| Women >84 cm¥ or >80 cm§/ Mens >88 cm¥ or >90 cm§ | 90 | |
| **Casual glucose♣•** | | |
| >200 mg/dL | 19 | |
| ≤200 mg/dL | 81 | |
| **Total cholesterol ♥•** | | |
| Excellent (<200) | 57 | |
| High (≥200) | 43 | |
| **HDL♥•** | | |
| Low (<40 p/ man and <50 p/ woman) | 65 | |
| Borderline (40-60) | 24 | |
| High (≥60) | 11 | |

* Source: V Brazilian Arterial Hypertension Guideline (2006); † Source: World Health Organization (2004), ¥ Source: Barbosa PJ, et al. Arq Bras Cardiol (2006), § International Diabetes Federation Classification (2006), ♣Source: Update on Diabetes (2006); ♥Source: IV Brazilian Dyslipidemia and Atherosclerosis Prevention Guideline (2007); •the 100 participants had not fasted >8 hours.

Table 4 displays the study participants' distribution according to the combination of smoking, sedentariness, hereditariness, high blood pressure, high blood sugar, high total cholesterol, low HDL-C and increased abdominal circumference. All participants showed one of these cardiovascular risk factors. The minimum number of risk factors in men was 1 and the maximum 6, against a minimum number of 2 and a maximum of 6 as well in women.

**Table 4** - Aggregated CVRF in participants according to gender - Salvador, BA - 2008

| Gender | Number of risk factors – n (%) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| Male (n=56) | - | 2 (3.6) | 9 (16.1) | 9 (16.1) | 16 (28.6) | 18 (32.1) | 2 (3.6) |
| Female (n=44) | - | - | 1 (2.3) | 8 (18.2) | 16 (36.4) | 12 (27.3) | 7 (15.9) |
| **TOTAL** | - | 2 (2.0) | 10 (10.0) | 17 (17.0) | 32 (32.0) | 30 (30.0) | 9 (9.0) |

The general μ (mean) of these factors per participant was 4±1.2. It is also highlighted that 64.0% of men and 79.6% of women had 4 or more associated risk factors.

## DISCUSSION

The study involved a group of men and women, at high cardiovascular risk, characterized by clinical manifestations of CAD, mostly AMI. The mean age younger than 60 years stood out, indicating a population that tends to present CAD at a younger age, suggesting a more severe evolution of atherosclerotic disease. The mean age among men was 10.8% lower than the mean age of 65.8 years for American men and 16.3% lower than the mean 70.4 years for women[19]. The mean global age in this study (58.7±10.9 years) is similar to the AFIRMAR[5] study, with a median 56 (48-65) years, a Brazilian multicenter study of people after their first AMI, confirming the prematurity of clinical manifestations of CAD in developing countries.

This group presented homogeneous socioeconomic characteristics, such as dependence on care delivery through the Unified Health System (SUS), basically coming from Salvador City and the Metropolitan Region, mainly self-declared mulatto and living in conditions of social inequality, as evidenced by low education and family income levels and high professional inactivity, due to retirement or unemployment. These findings confirm descriptions in Brazilian literature[8] on these characteristics as enhancing the risk for CVD. In this particular case, AFIRMAR[5] is similar to the present study population in the income level below R$600, present in 40.5% of participants, end education level up to the first year of primary education, present in 62.0%, but strongly contrasts in terms of ethnic origin, with only 16% of white participants. This aspect raises the possibility that, in a country with high levels of ethnic mixture, economic, cultural and educational inequalities serve as the main conditioning factors for greater severity of the disease. This hypothesis is limited, though, by the impossibility of comparing the way ethnic origin was classified, self-declared in the present sample, but not identified in the AFIRMAR study[5].

These people's socioeconomic and educational profile is associated with high prevalence and aggregation levels of cardiovascular risk factors, which justifies a more severe disease

that manifests itself earlier. As found in that research, other studies[8] have found that between 80% and 90% of men and women after acute coronary events or submitted to coronary artery bypass graft surgeries presented at least one out of eight well-known cardiovascular risk factors: arterial hypertension, diabetes, high total cholesterol or low HDL-cholesterol levels, overweight/obesity, central obesity, sedentariness and hereditariness. In comparison with the Brazilian sample in AFIRMAR[5], the presence sample shows prevalence levels of hypertension and diabetes 42.2% and 38.2% higher, respectively. The clinical and laboratory data obtained from patients who were under outpatient treatment, after hospital admission, showed the highest risk ratios for central obesity (90.0%) and high blood pressure (65.0%), followed by hypercholesterolemia (57.0%) and high blood glucose (19.0%). The condition reveals to be more severe, however, when considering the aggregation of these indicators per individual, with a mean 4±1.2 and 64.0% of men and 79.6% of women displaying four or more risk factors.

After evidencing these people's severity, whose risk increases in comparison with their low socioeconomic condition, it should be discussed that this also reflects the inefficiency of the current care model as a specialized high-complexity reference center. This is not an isolated example however. Data on risk factor control, centered on changes in life habits, especially food habits, physical activity and adherence to pharmacological treatment, show difficulties that do not depend on social class. Instead, they are related to the conditions inherent in human beings, regarding values established across the lifetime and difficulties to accept the disease condition. These, however, are combined with specific conditions that are aggravated in low-level social groups, hampering the understanding of messages between the care staff and the patient, and low purchasing power, another main limiting factor, especially considering the existence of a health system any citizen is entitled to.

To overcome these barriers and improve the care quality, as done in this study, the situation needs to be identified, so that adequate therapeutic and preventive care strategies can reach their goal. The most basic is the structuring of interdisciplinary teams, including physicians, nurses, nutritionists, pharmacists, social workers, psychologists and secondary-level technicians, culminating with health agents. Nevertheless, joint work training is needed, including well-defined competencies and activity strategies with a view to the greater good of risk control, without which the high cost of high care technology does not play its role.

The lack of blood pressure control was frequent in the study group, as 94% informed arterial hypertension and, in the clinical assessment, a minority (20%) showed blood pressure levels within normal parameters according to the V Brazilian Hypertension Guideline[11]. This finding is concerning and calls for the establishment of control strategies, as arterial hypertension is considered a risk factor strongly associated with severe cardiovascular events in the global and Brazilian population[3,11].

Another important cardiometabolic risk factor associated with the increase in cardiovascular event rates is diabetes mellitus. Besides predisposing to the development of CAD, it also increases the risk of acute coronary syndromes, whose incidence levels rise up to 20% in seven years among diabetics, against 3.5% among non-diabetics[17]. In this study, most participants showed more controlled casual glucose levels, with casual glucose =200 mg/dL in 81.0% of cases. Nevertheless, 19% of casual glucose ³200mg/dL is a relevant percentage, mainly when considering that these were individuals with confirmed diabetes, representing 54.3% of this group.

Eighty-three percent of participants informed dyslipidemia, a risk factor associated with myocardial infarction of greater clinical impact, according to the *INTERHEART*[4] study. Out of 17 participants who mentioned its absence or lack of knowledge about the presence of this condition, nine showed total cholesterol levels ³200mg/dL and 13 low HDL. High frequencies were also found for patients with lipid profile alterations, 43.0% with high total cholesterol (=200 mg/dL) and 65.0% with low HDL-C.

In the BMI (body mass index) assessment, an indicator of generalized obesity, more than half of the sample manifested overweight or some grade of obesity, which is related to high prevalence and incidence levels of CVD. It is considered one of the main current public health problems in developed and emerging countries[13]. The BMI has been used to stratify cardiovascular risk levels and to make therapeutic decisions on associated clinical situations[14] . This index alone, however, does not join the conditions for body fat assessment. In addition, it does not always estimate obesity patterns correctly, demanding the use of other indicators[15]. Recent evidence has demonstrated a stronger association between central obesity indicators and high coronary risk than between generalized obesity indicators and high risk levels[15-16].

In the present study, the mean abdominal circumference was used as a central obesity indicator. It was observed that this level was high in all women and 82.0% of men. These data demonstrate a concerning lack of control, as abdominal circumference is more specific as a risk factor, mainly in the overweight range, as it indicates abdominal fat concentrations, a basic pathophysiological expression of the metabolic syndrome, whose complete form is characterized by central obesity, hypertension, low HDL-C, high triglyceride levels and diabetes melittus[2].

The finding that 59 participants quit smoking after the cardiovascular event, most of them for more than two years, was important and shows a lifestyle change needed to prevent and control CVD. Nowadays, only 4.0% were still smoking. It is known that patients after a coronary event can reduce, by up to 50%, their risk of a new event (AMI), of sudden cardiac death and total mortality if they quit smoking. The speed and magnitude of risk reduction when one stops smoking are a source of discussion though, with some studies mentioning 3 to 20 years after the interruption, associated with significant reductions in CAD[20].

Although moderate consumption of alcoholic beverages showed to be a protection factor in the *INTERHEART*[4] study, in the present study, the quantity, type and frequency of patients' daily intake was not explored. Thus, only a change in life habits can be characterized, with 51.0% of the interviewees who gave up drinking after the coronary event.

Another prevalent cardiovascular risk factor in the study was sedentariness, which may have contributed to the high prevalence levels of overweight/obesity, increased abdominal circumference and dyslipidemia, as 81.0% of participants denied regular physical exercise, especially men. Regular physical exercise is fundamental to prevent CAD. Positive effects on the lipid and glucose profile, blood pressure, body composition, hormones, intestinal transition and psychological stress seem to be the main mechanisms through which physical exercise protects patients with chronic conditions[3]. At least 60.0% of participants did not comply with the recommended minimum of 30 minutes per day of moderate physical exercise, five days per week, increasing the risk of CVD or another event by 1.5 times[21].

Genetic heritage of CAD is also considered a very important risk factor in susceptibility to the action of environmental factors or in the development of metabolic disorders, whose severity alone can determine the disease[2]. It was verified in 64% of the subjects' first-degree relatives and more present among men.

The presented data revealed non-control of different CVRF in the study sample, which may result from the combination of behavioral, economic, social variables and patients' understanding of medication and non-medication treatment of CAD. When not adopted, measures to prevent and control a CVRF can also imply non-control of other factors, as these are interrelated. One example is the adoption of healthy eating habits and physical exercise as important components in hypertension, diabetes, dyslipidemia and obesity prevention and control.

The study presents a challenge towards reflection, practice and assessment of interdisciplinary care practices with a view to lifestyle changes and better control of clinical and anthropometric parameters in groups living in socially unequal conditions. It cannot be ignored that changing behaviors is not an easy task and that health education minimally presupposes that health professionals know the population they are delivering care to, take into account its sociocultural context and share personal healthcare projects with the clients[22]. It is essential that patients receive help to understand the importance of treatment and to use available resources in a more adequate and attractive way so as to prevent new coronary events.

## CONCLUSION

CAD patients followed in high-complexity referral hospitals for cardiology care showed lack of control of clinical and anthropometric parameters and life habits that entail cardiovascular health risks. These risk indicators for morbidity and mortality due to CAD cannot solely be modified through the application of high-complexity technology, but mainly through lifestyle changes. The sample's low socioeconomic level and a dissatisfactory interdisciplinary approach seem to constitute the most important factors for these findings, and efforts are needed to revert them.

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