Original Article

Prevalence of Cardiovascular Risk Factors in Elderly Individuals treated in the Brazilian Public Health System in Goiânia

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Abstract

Background: Cardiovascular risk factors (CVRF) present a high prevalence and have an impact on the morbimortality of the elderly; however, this question is still unknown by the elderly treated in the Brazilian Public Health System (SUS).

Objective: To investigate the prevalence of CVRF among the elderly treated by SUS in the city of Goiânia, state of Goiás, Brazil.

Methods: Cross-sectional study using a multiple-stage sampling method, carried out through a home-based interview with 418 elderly individuals aged > 60 years treated by SUS in the city of Goiânia, state of Goiás, Brazil. Socioeconomic and demographic data, as well as data on lifestyle, weight, height, waist circumference, blood pressure and medications used were collected. The studied CVRF were: arterial hypertension, diabetes mellitus, total obesity, central obesity, dyslipidemias, smoking, sedentary lifestyle and alcohol consumption. The Chi-square test was used for the analyses of the associations, with significance being set at 5%.

Results: The prevalences of the CVRF were: 80.4% of arterial hypertension; 83.3% of central obesity; 59.8% of sedentary lifestyle; 32.2% of total obesity; 23.4% of dyslipidemias; 19.1% of diabetes mellitus; 10.0% of smoking and 5.9% of alcohol consumption. As for the simultaneity, 2.4% of the elderly did not present CVRF. The simultaneity of two or more CVRF occurred in 87.3% of the elderly and was more frequent among women.

Conclusion: The CVRF occur simultaneously in more than half of the elderly individuals, and the most prevalent ones were: arterial hypertension, central obesity and sedentary lifestyle. It is necessary to foster the strategies of health promotion and prevention of cardiovascular injury in elderly individuals treated by SUS in the city of Goiânia, especially among those with simultaneous CVRF. (Arq Bras Cardiol 2010; 95(5): 621-628)

Keywords: Cardiovascular diseases; risk factors; aged; primary health care; Goiânia; Brazil.

Introduction

The population aging process increases the need to be acquainted with the health status and risk factors involved in the genesis of non-transmissible chronic diseases, mainly of cardiovascular diseases (CVD)[1]. Since the 60s, the CVD have been the leading cause of death in the country, are responsible for a significant impact on the mortality rate of the Brazilian population and corresponded, in 2007, to 29.4% of the deaths in all age ranges and 37.7% of the deaths among the elderly[2].

The Framingham Heart Study is a cohort in which the individuals are followed longitudinally, to assess the incidence of outcomes among the individuals exposed or not to the factors of interest. The INTERHEART Study is a multicentric study with a case-control design, which is characterized by retrospectively obtaining information. Based on the results observed in the Framingham Heart Study as well as in the INTERHEART Study, the following were established as risk factors with the highest probability for the development of CVD: smoking, arterial hypertension, dyslipidemias and diabetes mellitus. Total and central obesity and sedentary lifestyle were also positively associated with the risk of developing CVD[3].

These factors commonly occur simultaneously, which characterizes a higher risk when compared to the sum of the effect of each one alone, as evidence of synergy. Genetic predisposition and environmental factors also contribute to the simultaneity of these factors, in individuals with an unhealthy lifestyle[4].

Therefore, the increase in the number of people older than 60 years, the significant impact of CVD in this age range and the scarcity of information in the literature were the reasons for the proposal of the present study to investigate the prevalence of cardiovascular risk factors (CVRF) in elderly individuals treated in the Brazilian Public Health System (SUS), in the city of Goiânia, state of Goiás, Brazil.

Methods

The present was a cross-sectional study carried out through home interviews. This study is part of a more comprehensive population survey on the health status of elderly individuals in the city of Goiânia - the "Goiânia Elderly Project".

The study population consisted of elderly individuals aged ≥ 60 years, of both sexes, treated in the Brazilian Public Health System (SUS) in the city of Goiânia. The sample necessary for the study was calculated as 384 individuals, considering the following factors: prevalence of 13% of diabetes mellitus, chosen as it is the CVRF with the lowest prevalence; 95% confidence level; test power of 80%; non-exposed (non-obese)/exposed(obese) ratio of 1:2; and prevalence ratio of 2.

Due to the lack of electronic files of all outpatient clinic consultations, the sampling procedures were carried out in multiple stages: 1) proportional allocation of the total number of the sample in the nine sanitary districts (SD) of the city, according to the proportion of elderly individuals living in each SD; 2) the technical directors of each one of the nine SD of the city were contacted, to indicate the Health Unit with the highest attendance; 3) in these Health Units, the names and addresses of Public Health System users aged ≥ 60 years were identified from the active filing system, who had been treated during the previous 12 months; 4) based on this listing, a simple random allocation was carried out.

The study procedures were carried out by previously trained and standardized interviewers and anthropometrists, during a pilot study. The standardization of the anthropometrists followed the methodology validated by Habicht (1974)[5]. The data were collected from April 2008 to March 2009, by nine pairs of professionals, consisting of one anthropometrist and one interviewer.

Data collection consisted in anthropometric and BP measurements and an interview, with a standardized and pre-tested questionnaire for the collection of data on health status, lifestyle, socioeconomic and demographic data. The quality control of the research consisted in re-applying 12 questions from the questionnaire and re-obtaining four anthropometric measurements in 10% of the residences visited in each SD, which showed a high level of concordance between variables at the Kappa test.

The analyzed sociodemographic variables were sex, age, marital status and degree of schooling. The economic status was classified according to the Criterion for Economic Classification of the *Associação Brasileira de Empresas de Pesquisa* (ABEP) of 2009[6], but, for analysis purpose, the categories were clustered as A/B; C; and D/E. The following anthropometric measurements were collected according to the standardized procedures[7]: weight, height and waist circumference (WC).

Weight and height were used to calculate the body mass index (BMI), by dividing the weight (kg) by the square height (m). BMI values were classified according to the World Health Organization (1995)[8] and total obesity was considered when BMI ≥ 30 kg/m².

The WC was analyzed based on the cutoffs in relation to the risk of developing metabolic complications and abdominal adiposity, suggested by the World Health Organization[9]. A WC > 80 cm for women and > 94 cm for men was considered a CVRF.

Blood pressure (BP) was obtained with a semiautomatic equipment (OMRON - HEM 705 CP), according to specific procedures[4]. The individuals were considered to be hypertensive when the systolic blood pressure (SBP) ≥ 140 mmHg, with a diastolic blood pressure (DBP) ≥ 90 mmHg or when they were being treated with some type of anti-hypertensive medication, whether the BP levels were elevated or not at the moment of the interview[4]. The elderly individuals were considered as having diabetes mellitus when they reported, at the moment of the interview, being treated with hypoglycemiant agents. The presence of dyslipidemia was identified by the use of specific medications or when the interviewees reported having hypercholesterolemia or hypertriglyceridemia, previously diagnosed by a physician. All medications were identified according to the medical prescriptions or presence of the medication at the interviewee's home and classified according to the Guidelines for ATC (Anatomical Therapeutic Chemical) classification system[10]. Regarding the smoking status, the participants were identified as non-smokers (never smoked), ex-smokers and smokers.

The active smoker, those with a current habit of tobacco or tobacco product use (cigarette, pipe or cigar) and the fact that the individual had possibly stopped smoking for a period < six months were considered a CVRF[11].

The sedentary lifestyle variable was defined as the presence of all the following categories: inactive in leisure time (no physical activity during leisure); inactive in house-cleaning activities (absence of heavy housework activities on at least three days a week, lasting < 3 hours); occupationally inactive (self-report of remaining seated most of the time or of performing activities of little physical effort, only) and inactive when going to work (going to work by car, motorcycle, bus or walking or riding a bicycle for less than 10 minutes)[12].

Alcohol consumption was assessed based on questions regarding the consumption of alcoholic beverages (yes/no), the type of alcoholic beverage, the frequency and the amount (doses, bottles or glasses) of alcohol consumed during the previous week and then, the number of grams of ethanol per day was determined. Alcohol consumption was considered a CVRF when the amount of ethanol consumed was > 30 g/day for men and 15 g/day for women or low-weight individuals[4].

The questionnaires were revised to construct the database, using the EPI DATA™ software, release 3.1 (2005) with double entry to check for consistency. The statistical analysis was carried out using the STATA/SE software, release 8.0 (2003). Pearson's Chi-square and the Trend test or Fisher's Exact test were used to evaluate the association between risk factors and the socioeconomic, demographic and anthropometric variables, with a level of significance set at 5% (p < 0,05). For some variables, other tests were applied, such as the 95% confidence interval, means and standard deviations.

The major research project (Protocol # 031/2007) was approved by the Committee of Ethics in Research of *Universidade Federal de Goiás*. During the interview, the Free and Informed Consent Form was obtained from all participants.

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Results

Socioeconomic and demographic data and nutritional status

A total of 418 elderly individuals were assessed and the sample was characterized by a predominance of the female sex (66.0%), mean age of 70.7 ± 7 years (60 to 98 years) and a degree of schooling of 3.6 ± 3.6 years. Table 1 shows that most of the assessed sample, around 73% (n=304) was at the age range of 60 to 74 years. Regarding the socioeconomic profile, it was observed that 59.2% had completed up to the 7th year of Elementary School and around 50% belonged to economic class C, but men presented a better degree of schooling (p=0.027) and economic status (p=0.001). The frequency of elderly individuals that were married or lived with a partner was two-fold higher among men (81.7%). It was also observed a high prevalence of excess weight among women (63.6%) , who presented a higher frequency of total obesity (p=0.001).

Prevalence and distribution of cardiovascular risk factors

The cardiovascular risk factors, according to sex, are shown in Table 2. Among them, arterial hypertension presented the highest prevalence, followed by central obesity, sedentary lifestyle and total obesity, which were significantly more frequent among women. Alcohol consumption during the previous 30 days was reported by 24.6% (n=35) of the men and 10.5% (n=29) of the women; however, only 25 elderly individuals (6.0%) declared consuming an amount of alcohol that represented a risk for CVD (Table 2), a significant information among men (p=0.016).

There was an increase in the frequency of sedentary lifestyle at the age range of 70 years and older, which was higher among the elderly older than 75 years. The older the individual, the lower the prevalence of total obesity, notably after 75 years (p<0.001). Table 3 shows that smoking was prevalent at the age range of 60 to 64 years, with a decrease in the range of 65 to 69 years; from that age range on, there was a tendency toward the increase in the prevalence of smoking (p=0.005).

Table 1 - Sample description by socioeconomic and demographic variables and by nutritional status, according to sex, of the elderly individuals treated in the Brazilian Public Health System (SUS) in the city of Goiânia, state of Goiás, 2008-2009

Variables	Total (n = 418)		Male (n = 142)		Female (n = 276)		p value*
	n	%	n	%	n	%	
Age range							0.714
60 to 64	86	20.6	27	19.0	59	21.4	
65 to 69	117	28.0	39	27.5	78	28.2	
70 to 74	101	24.2	39	27.5	62	22.5	
≥75	114	27.3	37	26.1	77	27.9	
Years of schooling†							0.027
0	112	27.2	31	22.0	81	29.9	
1 to 3	117	28.4	36	25.5	81	29.9	
4 to 7	127	30.8	46	32.6	81	29.9	
+ 8	56	13.6	28	19.9	28	10.3	
Socioeconomic class							0.001
A/B	42	10.0	24	16.9	18	6.5	
C	210	50.3	74	52.1	136	49.3	
D/E	166	39.7	44	31.0	122	44.2	
Marital status‡							<0.001
Lives with partner	229	54.8	116	81.7	113	40.9	
Lives without partner	189	45.2	26	18.3	163	59.1	
Nutritional status (BMI: kg/m²)							0.001§
Low weight (BMI < 18.5)	17	4.1	4	2.8	13	4.7	
Eutrophia (BMI 18.5 to 24.99)	135	32.3	47	33.1	88	31.9	
Overweight (BMI 25 to 29.99)	153	36.6	67	47.2	86	31.2	
Obesity (BMI ≥ 30)	113	27.0	24	16.9	89	32.2	

* Pearson's Chi Square. †Lack of data for six elderly individuals, who did not know how to answer. (0) illiterate; (1-3) did not finish First Grade or completed only 1st to 3rd Grade; (4-7) finished 4th Grade or completed between 5th and 7th Grade; (8 or +) finished 8th Grade; did not finish High School; finished High School; did not finish College/University; finished College/University; attended Post-Graduation (specialization, Master's Degree). ‡ Lives with a partner or is married. Lives without a partner: single, separated, divorced or widowed. § Fisher's Exact Test.

Table 2 - Prevalence of cardiovascular risk factors according to sex in elderly individuals treated in the Brazilian Public Health System (SUS) in the city of Goiânia, state of Goiás, Brazil - 2008-2009

Risk factors	Total (n = 418)		Male (n = 142)		Female (n = 276)		p Value*
	n	%	n	%	n	%	
Arterial hypertension	336	80.4	108	76.1	228	82.6	0.110
Central obesity†	317	76.2	88	62.4	229	83.3	<0.001
Sedentary lifestyle	229	54.8	64	45.1	165	59.8	0.004
Total obesity	113	27.0	24	16.9	89	32.2	0.001
Dyslipidemias	98	23.4	33	23.2	65	23.6	0.943
Diabetes mellitus	80	19.1	24	16.9	56	20.3	0.404
Smoking	42	10.0	16	11.3	26	9.4	0.552
Alcohol consumption ‡	25	6.0	14	9.9	11	4.0	0.016

*Pearson's Chi-square test. †Data lacking for two elderly individuals. ‡Alcohol consumption: amount of ethanol consumed that characterizes risk consumption: men > 30 g/day and women > 15 g/day⁶.

Table 3 - Prevalence of cardiovascular risk factors according to age range in elderly individuals treated in the Brazilian Public Health System (SUS) in the city of Goiânia, state of Goiás, Brazil - 2008-2009

Risk factors	Age range (years)								p Value*
	60 to 64		65 to 69		70 to 74		75 or +		
	%	95%CI	%	95%CI	%	95%CI	%	95%CI	
Arterial hypertension	76.7	66.4 - 85.2	80.3	72.0 - 87.1	80.2	71.1 – 87.5	83.3	75.2 - 89.7	0.280
Central obesity†	76.7	66.4 - 85.2	78.3	69.6 - 85.4	78.2	68.9 – 85.8	71.9	62.7 - 79.9	0.390
Sedentary lifestyle	50.0	39.0 - 61.0	42.7	33.6 - 52.2	62.4	52.2 - 71.8	64.0	54.5 - 72.8	<0.001
Total obesity	38.4	28.1 - 49.5	29.9	21.8 - 39.1	28.7	20.1 – 38.6	14.0	8.2 - 21.8	<0.001
Dyslipidemias	19.8	12.0 - 29.8	29.9	21.8 - 39.1	20.8	13.4 – 30.0	21.9	14.7 - 30.7	0.750
Diabetes mellitus	16.3	9.2 - 25.8	23.9	16.5 - 32.7	18.8	11.7 – 27.8	16.7	10.3 - 24.8	0.690
Smoking	19.8	12.0 - 29.8	6.0	2.4 - 11.9	7.9	3.5 – 15.0	8.8	4.3 - 15.5	0.005
Alcohol consumption	5.8	1.9 - 13.0	7.7	3.6 - 14.1	5.9	2.2 – 12.5	4.4	1.4 - 9.9	0.510

*Chi-Square Test for Trend. † Data lacking for two elderly individuals.

The analysis of the association of the CVRF with the degree of schooling showed that only the sedentary lifestyle presented a significant association, although it became lower as the degree of schooling increased, with a prevalence of 59.8% among the illiterate and 37.5% among the elderly with 8 or more years of schooling (p=0.020). Regarding the CVRF according to the categories of socioeconomic class, there was no statistically significant difference for the investigated factors. As for the CVRF analyzed in relation to marital status, a significant difference was observed only for the consumption of alcohol, which was higher among the elderly that lived with a partner, with a prevalence of 9.6% and for those who lived without a partner, with a prevalence of 2.1% (p=0.003).

There was a tendency toward the increase in the prevalence of arterial hypertension (p=0.010), central obesity (p<0.001) and diabetes mellitus (p<0.001), according to the BMI value. Smoking was prevalent among the eutrophic individuals (p<0.001), with a decrease among those who were overweight or obese (Table 4).

As for the simultaneity of risk factors (Table 5), it was observed that 2.4% of the studied population did not present any factor. The total number of participants with two or more risk factors was 87.3% of the total sample, with a higher frequency among women (92.4%) than among men (77.5%). None of the elderly individuals presented the eight risk factors simultaneously.

A frequency of cardiovascular events was detected in 5.7% (n=24) of the individuals, of which 15 (3.6%) reported having had an acute myocardial infarction. Nine individuals (2.2%) reported a cerebrovascular accident and none of them presented both events simultaneously. These elderly individuals were not excluded from the analysis of the risk factors, considering that they were not free of risk.

Discussion

The present study showed a high prevalence of systemic arterial hypertension (SAH) (80.4%), higher than that found in the North-American population[13] and in Brazilian epidemiological studies, which showed a prevalence of SAH

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Table 4 - Prevalence of cardiovascular risk factors according to the nutritional status of elderly individuals treated in the Brazilian Public Health System (SUS) in the city of Goiânia, state of Goiás, Brazil - 2008-2009

| Risk factors[*] | n | Nutritional status n (%) | | | | | | | | p Value[†] |
| | | Low weight | | Eutrophia | | Overweight | | Obesity | | |
		%	IC95%	%	IC95%	%	IC95%	%	IC95%	
Arterial hypertension	336	70.6	44.0 - 89.7	74.8	66.6 - 81.9	81.0	73.9 - 86.9	87.6	80.1 - 93.1	0.010
Central obesity ‡	317	0.0	0.0 - 2.1	45.9	37.3 - 54.7	94.1	89.1 - 97.3	99.1	95.2 - 100.0	<0.001
Sedentary lifestyle	229	70.6	44.0 - 89.7	51.9	43.1 - 60.5	51.0	42.8 - 59.1	61.1	51.4 - 70.1	0.520
Dyslipidemias	98	11.8	14.6 - 36.4	23.0	16.2 - 31.0	24.8	18.2 - 32.5	23.9	16.4 - 32.8	0.490
Diabetes mellitus	80	0.0	0.0 - 2.0	12.6	7.5 - 19.4	22.2	15.9 - 29.6	25.7	17.9 - 34.7	<0.001
Smoking	42	11.8	14.6 - 36.4	17.0	11.1 - 24.5	7.2	3.6 - 12.5	5.3	2.0 - 11.2	<0.001
Alcohol consumption	25	11.8	1.5 - 3.6	5.9	2.6 - 11.3	5.9	2.6 - 11.3	5.3	2.0 - 11.2	0.520

[*] Total obesity was excluded from risk factors. [†] Chi-square Test for Trend. ‡ Data lacking for two elderly individuals.

Table 5 - Simultaneity of cardiovascular risk factors according to sex, in elderly individuals treated in the Brazilian Public Health System (SUS) in the city of Goiânia, state of Goiás, Brazil - 2008-2009

| Number of risk factors | Total (n = 418) | | Male (n = 142) | | Female (n = 276) | | p value[†] |
	%	95%CI	%	95%CI	%	95%CI	
None	2.4	1.2 - 4.4	3.5	1.2 - 8.1	1.8	0.6 - 4.2	0.279‡
1	10.3	7.5 - 13.6	19.0	13.0 - 26.6	5.8	3.3 - 9.2	<0.001
2	22.3	18.4 - 26.5	26.1	19.2 - 34.3	20.3	1.6 - 2.6	0.179
3	31.3	26.9 - 36.0	24.0	17.3 - 32.0	35.1	29.5 - 41.1	0.019
4	22.7	18.8 - 27.0	21.1	14.8 - 29.0	23.6	18.7 - 29.0	0.708
≥ 5	11.0	8.2 - 14.4	6.3	3.0 - 11.8	13.4	9.6 - 18.0	0.029

[*] Cardiovascular risk factors: arterial hypertension, diabetes mellitus, dyslipidemias, total obesity, central obesity, smoking, sedentary lifestyle and alcohol consumption. [†] Pearson's Chi-square. ‡ Fisher's Exact Test.

between 39% and 72.5% among the elderly[14-17]. The results of the Framingham study confirm that the prevalence of SAH tends to increase with age, but in the last four decades, there was no decrease in the prevalence of SAH, in spite of the progress achieved concerning its detection and treatment[18].

It was also observed a high prevalence of central obesity (76.2%), which was significantly higher among the women (83.3%). In a study carried out in the city of Fortaleza, with elderly individuals treated in SUS, the prevalence of WC above the normal cutoffs was lower (52.0%) than the one found in the present study and more frequent among women (68.9%)[19].

In a study carried out in the United States, with non-institutionalized hypertensive elderly individuals[20], the prevalence of central obesity was 79.0% for women. The increase in the WC seems to be associated with the BMI, as the frequency of central obesity was higher among the elderly individuals who were overweight or obese, as also observed by Tinoco et al[21].

The sedentary lifestyle, when considering the absence of physical activities that generate energy consumption - in leisure, during housework - or as a means of locomotion, presented

a prevalence of 54.8%. Similar results were observed in population-based studies carried out in the South and Northeast regions of Brazil (58.0%)[22] and in Fortaleza, state of Ceará, Brazil (54.3%)[19]. A prevalence lower than that observed in the present study was found among elderly individuals treated in SUS from the city of Fortaleza[23] (41.4%) and in a population sample of 16 Brazilian capital cities[24] (40.0%). The prevalence of the sedentary lifestyle was significantly higher among women (59.8%), which is in accordance with other studies[22,24].

The prevalence of the sedentary lifestyle increased with age and was higher among the elderly older than 75 years (64.0%) and higher than that observed at the Epidoso (43.2%)[25]. In spite of its importance for health maintenance, physical activity has been greatly reduced in modern societies, especially in the groups of lower socioeconomic status and lower level of schooling[26]. The same was observed in the present study, in which the prevalence of the sedentary lifestyle was higher among the socioeconomic levels D/E and those with lower levels of schooling.

The prevalence of total obesity in the studied population (27,0%) was high in relation to the that observed in a sample

of Brazilian elderly individuals (17%)[24] and similar to the one observed in a sample of elderly individuals from Pelotas, state of Rio Grande do Sul, Brazil (25.3%)[27]. The prevalence was significantly higher among the women (32.2%), as observed in the aforementioned studies[24,27]. Regarding the age, it was observed that the older the age, the lower the prevalence of total obesity, notably after 75 years, which corresponds to the findings of the study by Silveira et al[27].

Due to the high cost of hypolipemiant drugs and the insufficient distribution of free medication, many elderly individuals do not use them. Therefore, for the diagnosis of dyslipidemias, we considered, in addition to the information on the use of specific medication through the medical prescription or presence of the drug in the household, the self-reported morbidity, an information that presents moderate sensitivity and specificity[28]. The prevalence of dyslipidemia was 23.4%, whereas Pereira et al[24] observed that 33.1% of the elderly reported hypercholesterolemia and, differently from the present study, a higher prevalence among women and a decrease in prevalence with age, being 16.7% in men aged 80 years or older.

The prevalence of diabetes mellitus in the present study (19.1%) was higher than the one reported by other studies, 10.3% at the *Pesquisa Nacional por Amostra de Domicílios* (PNAD)[29], 14.0% in the IDANT study with adults and elderly individuals[14] and 17.8% in a sample of Brazilian elderly individuals[24], as well as in international studies, 15.6% in the Epicardian cohort[30] from Spain and 16.9% in estimates from the United States[13].

The prevalence of diabetes mellitus was associated with excess weight in the present study, considering that a higher proportion of elderly individuals with this disease is classified as being overweight (22.2%) or obese (25.7%). In another study with adult individuals, the risk of diabetes increased with age and was incremented by excess weight and sedentary lifestyle, as these factors tend to be associated and present high prevalence among Brazilian elderly individuals[31], in addition to collaborating with type 2 diabetes mellitus to be responsible for a progressive increase in the mortality rates among the elderly[32].

The proportion of smokers in the studied population treated in SUS in Goiânia was 10.0%, a lower percentage than that observed in Fortaleza (27.6%)[23], in Bambuí (19.6%)[33], in Pelotas (14,4%)[27] and in the Brazilian sample (12.7%)[24], but it was higher than the population data from São Paulo (7.6%)[34]. The elderly individuals aged between 60 and 64 years smoke significantly more (19.8%) when compared with the older age ranges in the present study. In general, the prevalence of smoking among the elderly is lower than that observed among the younger individuals. That occurs due the interruption in the habit of smoking with the aging process, the presence of morbidities, the differences between generations or the premature death of smokers. However, elderly smokers, when compared to younger smokers, present a higher risk of developing diseases related to smoking, as they tend to present a longer and more intense exposure to tobacco[17].

The prevalence of alcohol consumption as a risk factor among the studied population of elderly individuals was 6.0%, which is higher than the one found in a sample of Brazilian elderly individuals[24] (3.2%) and lower than the one observed among the elderly in Fortaleza (13.8%)[23]. The prevalence of alcohol consumption was significantly higher among men, as observed in the study by Pereira et al[24].

Elderly individuals with two or more simultaneous CVRF were 87.3%, whereas in another study, carried out with individuals aged 60 or older, this simultaneity was lower (71.3%)[24]. The CVRF tend to occur simultaneously and their combination generally represents an increased total risk for cardiovascular diseases, when compared to the risk resulting from the sum of their isolated effects, which might indicate a synergistic effect among these factors[35].

Estimates of the combined effect of these factors consider that many of them are inter-related and are intermediaries in a causal chain. Therefore, an effective prevention of CVD will only be achieved with the global improvement in the risk profile of individuals and populations[36].

One of the limitations of the present study was the measurement bias, due to the impossibility of performing a biochemical evaluation for dyslipidemia and diabetes, which might have caused these diseases to be underdiagnosed. The possibility of under-notification raises extra concerns regarding the health situation of elderly individuals, as the observed prevalences were high, with the most severe of them being that of diabetes mellitus.

It is also noteworthy the possibility of reverse causality, typical in cross-sectional studies, which does not allow us to safely establish the causal associations between the events. Therefore, in the present study, the results on the prevalence of smoking, alcohol consumption and the sedentary lifestyle might have been influenced by the previous diagnosis of some disease. Another limitation is the fact that the sample consisted mainly of female individuals.

There was some difficulty to compare the results, as there have been few studies with elderly individuals treated in the public health system and considering that many times studies developed with the general population have been used. Therefore, this study becomes an important reference for other studies with elderly individuals treated in SUS. However, the results cannot be extrapolated to the Brazilian population of elderly individuals, as the characteristics of these elderly individuals are quite peculiar - usually, individuals presenting health problems, with low level of schooling and low income - with a marked risk profile in comparison to other elderly individuals.

Conclusion

The present study demonstrated the high prevalence of CVRF among the elderly treated in the Brazilian public health system in the city of Goiânia, state of Goiás, Brazil. The prevalence of arterial hypertension, diabetes mellitus, total and central obesity was higher than that found in most studies. Such data emphasize the importance of developing continuing assistance and educational programs for elderly healthcare promotion, as well as prevention of cardiovascular diseases. The information on the risk factors can collaborate with the multiprofessional approach to elderly healthcare, aiming at the prevention of complications related to cardiovascular diseases and the development of public policies directed at healthy aging.

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