

Cardiovascular Prevention in Octo/Nonagenarian Patients

Prevención cardiovascular en pacientes octononagenarios

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ABSTRACT

Objectives: The aim of this study was to analyze cardiovascular risk factors, medication and cardiovascular prevention goals achieved in an octo/nonagenarian population.

Methods: This was a descriptive, multicenter study of consecutive samples including subjects aged ≥ 80 years. LDL-C (< 130 and < 100 mg/dL in primary and secondary prevention), blood pressure ($< 150/90$ mmHg) and HbA1c ($< 7\%$) goals were evaluated.

Results: A total of 265 patients were included in the study (women 54.0%, age 85.0 ± 4 years). History of hypertension, dyslipidemia, smoking or diabetes was present in 74.3%, 47.5%, 4.5% and 16.2% of patients, respectively. In 26.2% of cases, patients received ≥ 3 antihypertensive drugs, 18.5% (primary prevention) and 58.3% (secondary prevention) received aspirin, and 50.6% received statins. The blood pressure goal was fulfilled in 80.8% of cases. The LDL-C goals were attained in 67.4% (primary prevention) and 63.9% (secondary prevention) of patients, and 76.9% showed glycemic control.

Conclusion: The prevalence of risk factors was significant, with a high proportion of patients achieving the recommended goals.

Keywords: Aged 80 or over - Risk factors - Cardiovascular disease / drug therapy

RESUMEN

Objetivos: Analizar en octononagenarios los factores de riesgo cardiovasculares, la medicación y el cumplimiento de las metas en prevención cardiovascular.

Material y métodos: Estudio descriptivo, multicéntrico, de muestras consecutivas que incluyó sujetos ≥ 80 años. Se evaluaron las metas de C-LDL (< 130 y < 100 mg/dL en prevención primaria y secundaria), presión arterial ($< 150/90$ mmHg) y HbA1c ($< 7\%$).

Resultados: Se incluyeron 265 pacientes (mujeres 54,0%, edad $85,0 \pm 4$ años). El 74,3%, 47,5%, 4,5% y 16,2% mostró hipertensión arterial, dislipidemia, tabaquismo o diabetes, respectivamente. El 26,2% recibía ≥ 3 antihipertensivos, el 18,5% (prevención primaria) y 58,3% (prevención secundaria) aspirina y el 50,6% estatinas. El 80,8% alcanzó la meta de presión arterial, el 67,4% y 63,9% alcanzó los objetivos de C-LDL (prevención primaria y secundaria) y el 76,9% mostró control glucémico.

Conclusión: La prevalencia de factores de riesgo fue considerable, y alcanzó una gran proporción de pacientes las metas recomendadas.

Palabras clave: Anciano de 80 o más años - Factores de riesgo - Enfermedad cardiovascular/tratamiento farmacológico

INTRODUCTION

The number of elderly people is continuously growing as a result of increased life expectancy. (1) Recommendations on how to treat cardiovascular risk factors in the elderly are unclear. The scores available for cardiovascular risk stratification do not include extreme ages, and focus on cardiovascular death instead of on other relevant prognostic factors in this age group, such as functional disability or dementia.

Multiple clinical trials have demonstrated the benefits of treating risk factors in a large group of patients. However, the elderly population has been almost systematically excluded from these trials. (2)

In 2003, the Argentine Society of Cardiology presented a consensus on cardiovascular diseases in

the elderly, highlighting the importance of a comprehensive approach to these patients. (3) Recently, a consensus on the management of risk factors in octogenarian patients has been published in Spain, with the participation of various specialties such as cardiology and geriatrics. (4) In our country, updated information on the prevalence, control, and management of risk factors in this particular group of patients is scarce.

The aims of this study were: 1) to analyze the prevalence of cardiovascular risk factors in a population over 80 years of age; 2) to analyze the treatments for cardiovascular prevention; and 3) to determine the achievement of blood pressure, C-LDL and glycemic control goals.

METHODS

A descriptive, cross-sectional, multicenter study was conducted with consecutive samples obtained in cardiovascular prevention clinics of seven cardiology centers in the Autonomous City of Buenos Aires and Greater Buenos Aires. Subjects aged ≥ 80 years were included, analyzing their history, cardiovascular risk factors, and drug therapy.

Fulfilment of the lipid and blood pressure goals recommended by the Spanish consensus for the octogenarian population was assessed. (4) The patient was considered to reach the lipid goal when the C-LDL value was <130 or <100 mg/dL in primary and secondary prevention, respectively. The blood pressure goal was $<150/90$ mmHg.

Glycemic control was considered in diabetic patients when the HbA1c value was $<7\%$. Frailty was assessed using the Edmonton Scale: 0-4 points, lack of frailty; 5 or 6 points, vulnerable elderly person; ≥ 7 points, frail elderly person. (5)

Statistical analysis

Continuous data between two groups were analyzed with Student's t-test or the Mann-Whitney-Wilcoxon test according to the distribution of variables. Categorical data were analyzed with the chi-square test. A multiple logistic regression model was performed to assess which variables were associated with greater likelihood of receiving statins, analyzing age, sex, risk factors and frailty. A value of $p < 0.05$ was considered statistically significant (two-tailed test).

Ethical considerations

The protocol was evaluated by the Argentine Society of Cardiology Ethics Committee.

RESULTS

A total of 265 patients (54.0% women, age 85.0 ± 4 years, 38.9% in secondary prevention) were included. Table 1 shows the characteristics of the study population.

Among these patients, 18.5% ($n=49$) had history of paroxysmal, permanent, or persistent atrial fibrillation; 30.6% received aspirin alone, while 67.4% were anticoagulated (29 patients with acenocoumarol and 4 with new oral anticoagulants). Among patients under anticoagulation with acenocoumarol, 69.2% showed the last INR in therapeutic range, although this proportion was 56.0% when considering the last two determinations.

In hypertensive patients, 46.9%, 22.9%, and 26.2% received 1, 2 or ≥ 3 antihypertensive drugs, respectively. The most commonly used drugs were: beta-blockers in 50.2% of patients, angiotensin II receptor blockers (ARBs) in 35.9%, and angiotensin-converting-enzyme inhibitors (ACEIs) in 29.8%. Those drugs were also the most commonly used among the subgroup of hypertensive patients with no history of coronary heart disease or atrial fibrillation. Aspirin use for primary and secondary prevention was received by 18.5% and 58.3% of patients, respectively. The total number of daily medications consumed by the population was 6.0 ± 2.7 drugs. Statins were administered in 50.6% of patients; the most commonly used regimens were atorvastatin 20 mg/day (24.6%), atorvastatin 10 mg/day (23.9%), and rosuvastatin 10 mg/day (10.4%).

Among these patients, 18.9% received high-intensity statin therapy. Presence of dyslipidemia (OR 15.8, 95% CI 7.9-31.8; $p < 0.001$), male sex (OR 2.6, 95% CI 1.3-5.1; $p=0.006$) and cardiovascular history (OR 5.0, 95% CI 2.5-10.3; $p < 0.001$) were associated with increased likelihood of receiving statins.

The blood pressure goal was reached by 80.8% of patients. Also, 67.4% and 63.9% of the subjects attained the therapeutic goals of LDL-C proposed for primary and secondary prevention, respectively. The lipid goal in secondary prevention was achieved less frequently in women compared with men (41.0% vs. 84.1%, $p < 0.001$). The proportion of patients who reached cardiovascular prevention goals is shown in Table 2.

According to the Edmonton scale, 41.2% of the patients showed no frailty, 25.0% were vulnerable elderly persons, and 33.8% had overt frailty. The proportion of subjects receiving high-intensity statins, 3 or more antihypertensive drugs, 2 or more hypoglycemic agents, and aspirin or anticoagulant agents was not significantly different in the frailty groups (Figure 1).

DISCUSSION

The present study analyzed a particular group of patients with differential epidemiological characteristics, and who may require different therapeutic goals from the rest of the population. In our study, a high prevalence of comorbidities was verified, which are also modulators of vascular risk and cause of polypharmacy.

About 75% of the population in our study evidenced high blood pressure. Our findings are consistent with previous reports, in which the prevalence of blood pressure in subjects >80 years was significant. (6) Recent hypertension guidelines propose more flexible goals for elderly patients or -at least- recommend a personalized treatment for frail patients. (7, 8) According to the latest Spanish consensus recommendations for the management of risk factors in octogenarians, (4) approximately 80% of our population achieved the recommended blood pressure goal. Even though all antihypertensive agents can be used in elderly patients, certain guidelines suggest that diuretics and calcium antagonists may be preferable in isolated systolic hypertension. (7) In our population, the most commonly used antihypertensive agents were ARBs, beta-blockers and ACEIs. Despite being controversial, the use of beta-blockers remained high even for the population with no coronary heart disease or atrial fibrillation.

The elderly population is underrepresented in clinical trials with statins. Exceptions include the PROSPER study (including subjects up to 82 years old) and the HPS trial (including subjects up to 80 years). (9, 10) Both studies used moderate-intensity statins (pravastatin 40 mg and simvastatin 40 mg). The most commonly used statins in our population were atorvastatin 10 and 20 mg/day, followed by rosuvastatin

Table 1. Characteristics of the total population, and according to sex

	Total population n=265	Men n=122	Women n=143	p**
Continuous variables, mean (SD)				
Age, years	85.0 (4.2)	84.4 (3.8)	85.5 (4.5)	0.06
Body mass index, kg/m ²	27.3 (5.7)	27.6 (5.2)	27.1 (6.0)	0.52
Waist circumference, cm	90.2 (14.8)	92.7 (15.4)	88.3 (14.1)	0.07
Systolic blood pressure, mmHg	128.5 (15.0)	126.8 (14.7)	130.0 (15.1)	0.08
Diastolic blood pressure, mmHg	75.2 (8.9)	74.6 (8.8)	75.7 (9.0)	0.36
Total cholesterol, mg/dl	172.7 (42.1)	161.5 (41.0)	182.4 (40.9)	<0.001
HDL-C, mg/dl	52.2 (13.9)	47.1 (13.3)	56.7 (13.2)	<0.001
LDL-C, mg/dl	102.9 (35.1)	93.6 (34.6)	111.1 (33.5)	0.001
Triglycerides, mg/dl	117.6 (45.3)	113.2 (51.1)	121.4 (39.4)	0.24
Creatinine, mg/dl	1.1 (0.8)	1.2 (0.7)	1.0 (0.4)	0.001
Glycemia, mg/dl	103.6 (29.3)	106.5 (29.6)	101.0 (28.9)	0.16
HbA1c, % (diabetic patients)	6.3 (0.9)	6.3 (0.9)	6.4 (0.9)	0.78
Categorical variables, %				
Hypertension	74.3	77.9	71.3	0.22
Dyslipidemia	47.6	50.8	44.8	0.32
Active smoker	4.5	5.7	3.5	<0.05
Ex-smoker	29.4	41.0	19.6	<0.05
Diabetes mellitus	16.2	20.5	12.6	0.08
Overweight	40.7	49.5	33.6	0.02
Obesity	25.9	25.7	26.1	0.65
Coronary heart disease	17.7	25.4	11.2	0.003
Stroke	10.6	12.3	9.1	0.40
Peripheral artery disease	21.1	20.5	21.7	0.81
Heart failure	10.2	13.9	7.0	0.06
Atrial fibrillation	18.5	23.0	14.7	0.08
Aortic valve disease	8.3	8.2	8.4	0.95
Mitral valve disease	6.8	6.6	7.0	0.89
Pacemaker	8.9	8.4	9.4	0.79
Arthrosis	43.8	33.6	52.5	0.002
Anemia	22.6	15.6	28.7	0.01
COPD	10.6	16.4	5.6	0.004
Depression	12.8	9.8	15.4	0.18
Parkinson's disease	3.4	3.3	3.5	0.92
Dementia	6.4	4.9	7.7	0.36
Peptic ulcer	5.0	5.0	5.0	0.99
Hypothyroidism	7.9	4.9	10.5	0.09
Chronic kidney disease	13.2	13.1	13.3	0.97
Cancer	13.1	13.9	12.6	0.74

SD: Standard deviation; COPD: Chronic Obstructive Pulmonary Disease.

*Difference between men and women.

10 mg/day. In secondary prevention, only 1 out of 5 subjects received high-intensity statins. In our work, the proportion of patients receiving statins was higher than in a previously published study, in which hospital records were evaluated (22% and 29% for primary and

secondary prevention, respectively). (11) The fact that our work analyzed patients seen in cardiovascular prevention clinics may explain these findings. Also, about two-thirds of the population achieved the LDL-C goal in both primary and secondary prevention. In

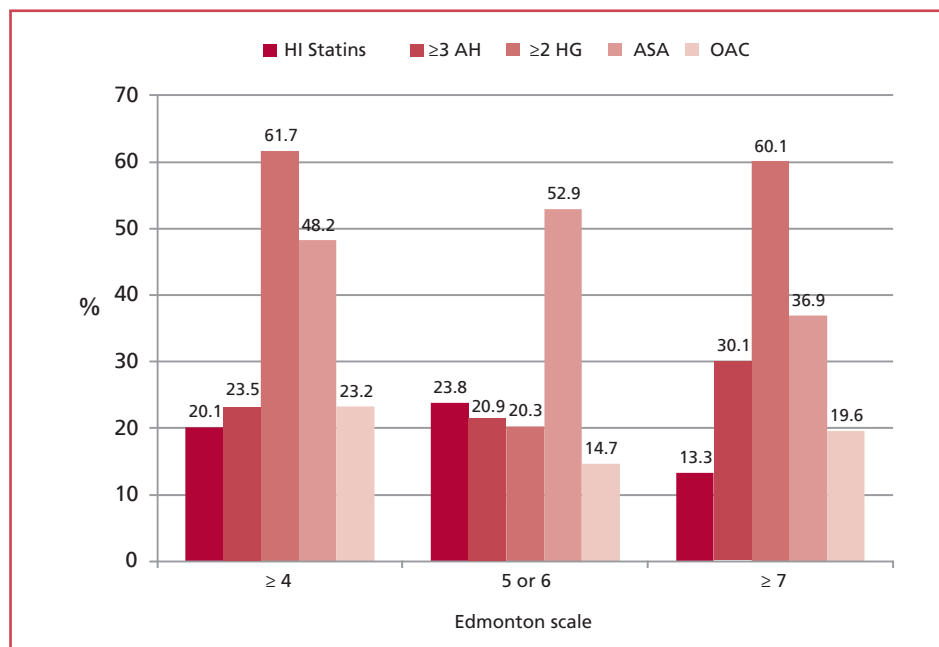


Fig. 1. Relationship between the treatments provided and the degree of frailty in elderly subjects. HI: High intensity; AH: Antihypertensive agents; HG: Hypoglycemic agents; ASA: Acetylsalicylic acid; OAC: Anticoagulant agents.

Achievement of therapeutic goals, %	Total population n=265	Men n=122	Women n=143	p**
LDL-C Goal	-	-	-	-
Primary prevention (<130 mg/dL)	67.4	75.7	61.5	0.16
Secondary prevention (<100 mg/dL)	63.9	84.1	41.0	< 0.001
Blood pressure goal (<150/90 mmHg)	80.8	83.6	78.3	0.28
HbA1c goal (<7%)*	76.9	70.6	88.9	0.38

Table 2. Achievement of cardiovascular prevention goals

*Only in the diabetic population.

**Between both sexes.

the latter case, the objective was more frequently met by male patients.

Less than 5% of the subjects in our work were active smokers. However, we should approach them as we do with younger smokers, since smoking remains an independent predictor of cardiovascular morbidity and mortality in elderly patients. (12)

Elderly patients with diabetes have higher rates of disability and death compared with individuals without diabetes. (13) However, there are no randomized studies demonstrating the benefits of intensive glyce-mic control in elderly patients. In addition, the risk of hypoglycemia is greater in this age group. In our work, the prevalence of diabetes was similar to that reported in an American registry. (14) About three-quarters of the diabetic patients achieved the HbA1c <7% goal. Moreover, all patients achieved the HbA1c <8.5% objective recommended by a recent Spanish consensus for the management of diabetes in the elderly. (15)

Finally, our work showed that male sex, dyslipi-demia, and history of cardiovascular disease were as-

sociated with greater likelihood of receiving statins. However, frailty in elderly subjects had no influence in the prescription of these drugs or in other useful treatments for cardiovascular prevention.

CONCLUSION

In this population of octo/nonagenarians, the preva-lence of risk factors was significant, and a great pro-portion of patients achieved the recommended goals. Elderly subjects received multiple medications, and statins were frequently used. Although therapeutic decisions in the elderly should be an individualized process based on clinical judgment and comprehensive geriatric assessment, the frailty of the elderly did not influence the intensity of the treatments implemented.

Epidemiology and Cardiovascular Preven-tion Council Research Group. Walter Masson, Gustavo Calderón, Salvador De Francesca, Diana Mil-lán, Ignacio Dávalos, Adriana Ángel, Augusto Lavalle-Cobo, Laura Vitagliano, Silvina Sagardia, Mariano Giorgi.

Conflicts of interest

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

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