CVA in young and old patients: a retrospective study

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Abstract

Objective: to evaluate the cerebrovascular disease (CVD) and associated vascular risk factors (VRF) in patients aged 55 years or less (young adults) and patients older than 65 (elderly).

Material and method: we performed a retrospective review of medical records of patients with a diagnosis of CVD from February 1989 to December 1993 at an Internal Medicine Ward of a Hospital Center in Porto area. We analyzed gender and age, CVD type and profile, VRF (previous CVA, hypertension (HT), diabetes, dyslipidaemia, heart disease, cigarette smoking and alcohol consumption); morbidity and mortality; blood pressure (BP), complete blood count, glucose and lipid analysis at admission.

Patients: 65 patients were young adults (YA) and 309 were elderly (Ed).

Results: the CVD in YA represented 14% and in Ed 66.7% of all CVD admitted; male were more prevalent in YA (52.3%) and female in Ed (58.3%). The most frequent type of CVD was ischaemic (82.8% in YA and 82.1% in Ed) with the lacunar sub-type more prevalent in YA (P=0.04) and the atherothrombotic in Ed (P=0.004); TIA represented 8.3% of ischaemia in YA and 3.3% in Ed. Previous CVA were reported in 20% YA and 32.7% Ed (P=0.04). The dyslipidaemia (43.1%), heavy alcohol consumption (24.6%) and cigarette smoking (12.3%) were more prevalent in YA. There was heart disease in 36.9% YA and 52.4% Ed (P=0.02); the valvular cardiopathy was more prevalent in YA (18.5%). Infectious complications were observed in 32.1% YA and 58.3% Ed (P=0.001). YA had a good improvement (slight deficits in 56.8% YA vs 28.3% Ed – P=0.001). The mortality rate in YA was 12.3% and in Ed 30.4% (P=0.003).

Conclusions: the prevalence of CVD in YA was 14%. We observed more prevalence of female in the elderly. Ischaemia was the most frequent CVA in both groups, the lacunar subtype was more frequent in YA and the atherothrombotic in Ed. Hypertension was the most frequent VRF in both groups. The valvular cardiopathy was more frequent in YA and atrial fibrillation in Ed. The morbidity and mortality was higher in older patients. On admission the mean level of diastolic BP, total cholesterol, LDL-C and triglycerides were significantly higher in YA.

Key words: cerebrovascular disease, young adults, older, vascular risk factor

Introduction

Cerebral vascular accident (CVA) or CVA, is a pathology with high morbidity and mortality rates, and has important consequences for the patient, the family and society.[1,2,3,4] In young adults, these consequences are more severe, not just because they occur in a more active and productive population, but also because the sequela can persist for decades.[5,6]

Contrary to what is believed, CVA occurs in a significant proportion of young adults. Its incidence varies in different studies, but its annual incidence is believed to be from 2.5 to 40 per 100,000 inhabitants.[4,6]

The etiologies of CVA in young adults are no different from those of CVA in the elderly; only their frequencies differ.[7,8]

The authors carried out this retrospective study to compare CVA in the population aged 55 years or under with those aged 65 and over, hospitalized in an Internal Medicine Service.

Material and methods

Of the 463 clinical process relating to patients hospitalized in the Internal Medicine Service in the period from 1st February 1989 to the 31st December 1993 with a diagnosis of CVA (according to WHO criteria),[9] those aged 55 years or under (designated young adults - YA) and those aged 65 or over (designated Elderly – Ed) were selected.

In the processes selected, the following parameters were analyzed: age and gender, hospitalization time, CAP, CVA type and profile, vascular risk factors (high blood pressure – HBP), dyslipidaemia, diabetes mellitus, heart disease, smoking and alcohol consumption), deficit on the date of discharge and mortality, infectious complications, blood pressure (BP),

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TABLE I

Vascular risk factors

	Young adults (n=65)	Elderly (n=309)
Previous CVA *	13 (20%)	101 (32.7%)
Hypertension	38 (58.5%)	194 (32.7%)
Dyslipidaemia	28 (58.5%)	118 (38.2%)
Diabetes	14 (21.5%)	73 (23.6%)
Cardiopathy **	24 (36.9%)	162 (52.4%)
Ischaemic	5 (7.7%)	30 (9.7%)
Atrial fibrillation ***	8 (12.3%)	103 (33.3%)
Valvular disease	12 (18.5%)	34 (10%)
Cardiac Insufficiency	6 9.2%)	36 (11.7%)
Smoking	8 (12.3%)	23 (7.4%)
Alcohol ****	16 (24.6%)	38 (12.3%)

* P=0.004; ** P=0.002; *** P=0.0008; **** P=0.01

hemogram, glycaemia and lipid profile on admission.

The criteria used were: 1. for the CVA type and profile, those of the NINDS;[10] 2. for the hypertension, those of the WHO[11] or hypertension medication; 3. for the dyslipidaemia, total cholesterol > 200 mg/dL or HDL-C < 35 mg/dl or LDL-C > 135 mg/dL or hypolipidaemic medication; 4. for the diabetes mellitus, fasting glycaemia levels > 140 mg/dl or hypoglycaemic medication; 5. for the ischaemic heart disease, the existence of at least one of the following criteria: (a) history of angina of the chest or myocardial infarction, (b) electrocardiographic findings of ischaemia, lesion or necrosis, (c) echocardiogram with segmental heart disease, atrial fibrillation – the existence of a demonstrative electrocardiogram; valvular cardiomyopathy - alterations in cardiac auscultation and demonstrative echocardiogram; cardiac insufficiency - existence of clinical signs; 6. for alcoholism, ingestion of > 60 g/day of alcohol; 7. for the scoring of deficits, the Rankin scale.

The data were submitted to univariate statistical analysis by the c^2 test or Fisher's test, to determine the differences in prevalence between the two groups of patients.

Results

Of the 463 clinical processes, 65 (14%) were selected corresponding to YA, and 309 (66.7%) to Ed. In the YA group, 34 (52.3%) patients were male and in the Ed group, 180 (58.3%) were female. The mean overall age was 45.8 ± 8.8 years (limits: 13 – 55) in the YA group and 75.4 ± 6.7 years (limits: 65 – 96) in the Ed group. No significant difference was found in mean hospitalization time (20.1 ± 16.8 in the YA and 20.2 ± 14.6 days in the Ed).

The type of CVA was not determined in 7 (10.8%) YA patients and in 86 (27.8%) Ed patients. Dividing the CVA into two main groups (intracerebral hemorrhage and ischaemic accident), we observed that 48 (82.8%) of the YA patients and 183 (82.1%) of the Ed patients had suffered ischaemic accidents, while intracerebral hemorrhage was the type of CVA in 10 (17.2%) of the YA and 40 (17.9%) of the Ed patients. Considering the cases of ischaemic CVA, we observed that in the YA group, the lacunar type was the most frequent (35.4% v 21.4% - P=0.04) while in the Ed group, the atherothrombotic type was the most frequent (41.5% v 18.8% - P=0.004); we did not observe a significant difference in the other types (cardioembolic 25% in the AG group and 22.4% in the Ed, haemodynamic 1.6%, undetermined in 12.5% of the YA and in 9.8 of the Ed).

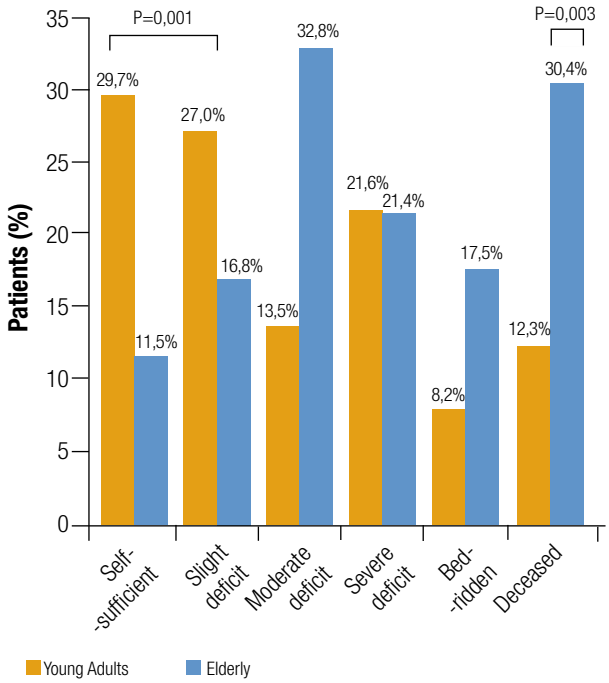
We did not observe any significant differences in the temporal profile, which was stable in 53 (81.5%) YA and 241 (78%) Ed patients, dynamic in 8 (12.3%) YA and 62 (20.1%) Ed, and TIA in 4 (6.2%) YA and 6 (1.9%) Ed.

A previous history of CVA was present in 20% of the YA and 32.7% of the Ed (P=0.04) (Table I).

The most frequent VRF in the YA patients were hypertension (58.5%), dyslipidaemia (43.1%) and heart disease (36.9%); in the Ed group, the most frequent VRF were hypertension (62.8%), heart disease (52.6%) and dyslipidaemia (38.2%) (Table I).

In relation to heart disease, valvular disease was the most prevalent heart disease in the YA group (18.5% v 10%) while the other types were more prevalent in the Ed group. Atrial fibrillation was significantly more prevalent in the Ed, with 33.3% v 12.3% (P=0.0008) (Table I).

Infectious complications were observed in 18 (32.1%) of the YA and 155 (58.3%) of the Ed (P=0.001). Urinary infections were the most frequent in both groups 13 (23.2%) YA and 98 (36.8%) Ed; respiratory infections were significantly more frequent in the elderly [18 (14.3%) in YA and 73 (27.4%) in Ed (P=0.04)].



Deficits on discharge. Mortality.

FIG. 1

On the date of discharge, 56.8% of the YA were self-sufficient or had a slight deficit, compared with 28.3% of the Ed (P=0.001) (Fig. 1). The mortality rate in the YA was 12.3% while in the Ed it was 30.4% (P=0.003) (Fig. 1).

From the analysis of mean BP and analytical values (Table II), the mean diastolic BP, total cholesterol, LDL cholesterol and triglycerides were significantly higher in the YA group.

Discussion

In terms of CVA, the cut-off point for the definition of a young adult is generally defined from the 20 through to 45-50 years of age. However, some authors use a cut-off point of 55 years.[5,6,12,13] In the present work, we consider 55 years as the cut-off point for the definition of a young adult.

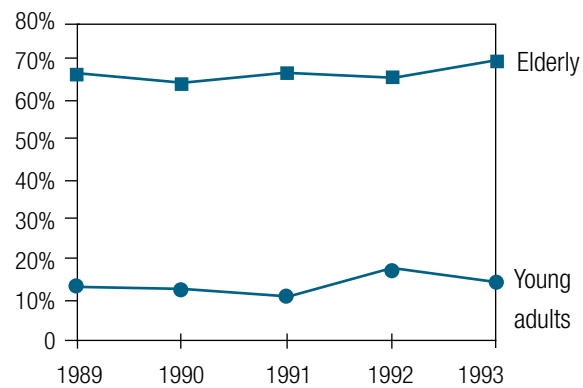
The prevalence of CVA in YA varies in the different studies, representing around 4-10% of all cases of CVA.[6,8] In our work, we saw that 14% of cases of CVA admitted in the five years analyzed occurred in YA, with an annual incidence of between 11.3% and 18.2% (Fig. 2).

TABLE II

Blood pressure and analytical values on admission

	Young adults	Elderly
Systolic BP (mmHg)	162.1 ± 32.7	160.7 ± 30.5
Diastolic BP	98.9 ± 22.8	89.6 ± 15.8
T. Cholesterol (mg/dl)	216.5 ± 49.4	194.9 ± 47.2
HDL – Cholesterol	42.4 ± 13.3	43.7 ± 16.1
LDL – Cholesterol	153.1 ± 39.9	132.3 ± 41.9
Triglycerides	153.4 ± 80.5	124.0 ± 51.0
Glucose	146.4 ± 74.0	151.4 ± 73.0
PCV (%)	45.0 ± 3.8	42.7 ± 6.3
Leukocytes (x109/L)	9.0 ± 2.4	230.8 ± 91.6

*P < 0.05



Annual incidence of CVA.

FIG. 2

In the gender distribution, the different works show a prevalence of CVA among females at very young ages (< 30 years) and among males over 30 years; this difference may reflect different etiologies of CVA in the different age groups, particularly the use of hormonal contraceptives by women.[5,6,12,14] In this work, we observed a prevalence of males in the YA group, while the average age among the females was lower (44.2 ± 8.7 in females and 47.3 ± 8.8 in males).

TIA in the YA group represented 8.3% of ischaemic accidents, a value that is far lower than that described

TABLE III

Vascular risk factors in ischaemic CVA in young adults

	Cardioembolic (n=12)	Atherothrombotic (n=9)	Lacunar (n=17)
Hypertension*	3 (25.3%)	4 (44.4%)	16 (94.1%)
Diabetes**		4 (44.4%)	6 (35.3%)
Dyslipidaemia*	1 (8.3%)	4 (44.4%)	12 (70.6%)
Atrial fibrillation*	7 (58.3%)		1 (5.9%)
Ischaemic Heart disease			2 (11.8%)
Valvular heart disease**	6 (50%)		4 (23.5%)
Smoking	1 (8.3%)	1 (11.1%)	
Alcohol**	1 (8.3%)	3 (33.3%)	

* P <0.005; ** P <0.05

TABLE IV

Vascular risk factors in ischaemic CVA in the elderly

	Cardioembolic (n=41)	Atherothrombotic (n=76)	Lacunar (n=17)
Hypertension*	28 (68.3%)	48 (63.2%)	37 (94.9%)
Diabetes**	6 (14.6%)	26 (34.2%)	6 (15.4%)
Dyslipidaemia*	13 (31.7%)	32 (42.1%)	26 (66.7%)
Atrial fibrillation*	30 (73.2%)	22 (28.9%)	10 (25.6%)
Ischaemic Heart disease	7 (17.1%)	11 (14.5%)	4 (10.3%)
Valvular heart disease**	9 (22%)	5 (6.6%)	3 (7.7%)
Smoking	2 (4.9%)	6 (7.9%)	
Alcohol**	5 (12.9%)	8 (10.5%)	

*P<0.005; **P <0.05

(around 1/3 of ischaemic accidents are TIA[5]), justified, in part, by the fact that it represents the prevalence of patients admitted to an Internal Medicine Service.

Ischaemic accident is more prevalent among the elderly (in patients over 60 years of age, around 80% of CVAs are ischaemic, whereas in YA, this figure is around 50%).[6,8,13] In the present work, the prevalence of ischaemic accidents was around 82% in both groups, which is comparable to the YA observed in the Lausanne stroke Registry[12] and in the Ed observed in other works.[15,16]

Intraparenchymal hemorrhages represent 10 – 20% of CVAs in YA.[5,8,17] In the present study, hemorrhagic CVA corresponds to intraparenchymal hemorrhages, with a prevalence of 17.2%.

The absence of subarachnoid hemorrhages in our study is due to the fact that these patients were not admitted to the Internal Medicine Service.

The most frequent etiologies of ischaemic CVA in YA are arterial dissection (20% of patients aged under 45), this being the first or second cause in various studies), cardioembolism (12 to 34%) and atherosclerosis (5 to 27%, including disease of the large and small arteries, with lacunar CVA being rare).[5,6,8,12] In our study, lacunar or atherothrombotic CVA accounted for 54.2% of CVAs in YA, and it was observed that these patients had a higher mean age (48.6 ± 5.8 years) and a high prevalence of VRFs (hypertension, dyslipidaemias and diabetes) (Table III).

The most prevalent types of heart disease in Ed were atrial fibrillation (P=0.0008) and ischaemic heart disease, while in YA, the most prevalent type was valvular heart disease (Table I), corroborating with previous studies which report that in YA, rheumatic valvulopathy and valvular prosthesis are the most frequent causes of cardioembolism, while in the Ed, atrial fibrillation and ischaemic heart disease are the most frequent.[5,8]

In the AI subtypes of both groups, we observed a higher prevalence of hypertension and dyslipidaemia in the lacunar type, diabetes in the atherothrombotic type, and atrial fibrillation and valvular heart disease in the cardioembolic type; in YA, alcohol was more prevalent in the atherothrombotic (Tables III and IV).

We believe that the high prevalence of infectious complications (around 1/3 in the YA and more than half of the Ed) is a result of the indiscriminate use of invasive technique, particularly urinary catheter insertion.

The lower morbidity rate in YA is in accordance

with what is reported, in that around three quarters of patients remain functionally independent.[5,6,12,18]

The mortality rate (12.3% in YA and 30.4% in Ed), despite corroborating with what is reported by Marquardsen for Europe,[19] is higher in YA than they describe for the acute phase (1.5 – 7.3%),[5,6] which is explained by the methodology used and by the percentage of infectious complications observed.[20]

Conclusions

1 – The prevalence of CVA in young adults was 14%;
2 – The prevalence of CVA was higher among elderly women;
3 – The incidence of ischaemic and hemorrhagic CVA was overlapping in both groups;
4 – Lacunar ischaemic accident was more frequent in young adults, while the atherothrombotic type was more frequent in the elderly;
5 – Hypertension was the most common risk factor in both groups;
6 – Valvular heart disease was more frequent in young adults, and atrial fibrillation in the elderly;
7 – CVA in young adults presents lower morbidity and mortality rates;
8 – The mean rates for diastolic BP, total cholesterol, LDL-cholesterol and triglycerides were significantly higher in young adults on the date of admission. ■

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