

Cerebrovascular diseases: Experience of an Internal Medicine Service for 8 years (1986-1993)

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Abstract

Objective: to evaluate the experience of a department of Internal Medicine in relation to cerebrovascular disease highlighting the importance of risk factors associated with this disease.

Design: retrospective review of medical records from 1986 to 1993.

Setting: Department of Internal Medicine in a tertian care Hospital.

Patients: One thousand three hundred and seventy three (1373) patients admitted with the diagnosis of cerebrovascular disease in which the following parameters were evaluated:

Distribution by sex, age and season, individual risk factors (Hypertension, diabetes mellitus, hyperlipidaemia and cardiovascular diseases), localization of lesion, type of cerebrovascular disease, morbidity and mortality.

Interventions: since 1992 we administered nimodipine to our patients at a dose of 240mg PO/day with subarachnoid hemorrhage and 120 mg P.O./day with cerebrovascular disease of ischemic etiology.

Measurements and main results: there was a greater incidence

of cerebrovascular disease in females and in the age group between 71 and 80 years old. It occurred more frequently in winter and summer.

Hypertension alone and hyperlipidaemia were the most frequent risk factors representing 67.3% and 41% of the total.

The left hemisphere of the brain was the most often involved and cerebrovascular disease of ischemic etiology the most frequent, representing 78.2% of the total.

Mortality was 17.9% we would like to stress that during the eight years studied the mortality rate reduced with a significant decrease since 1992.

Conclusions: cerebrovascular disease was the most common cause of admission between 1986 and 1993.

Taking into account the importance of the risk factor we would like to stress that the incidence of cerebrovascular disease may be reduced if we all cooperate towards a better prevention of some of the risk factors associated with this disease, namely hypertension, hyperlipidaemia and diabetes mellitus.

Introduction

Cerebrovascular diseases (CVD) are frequent pathologies, representing an important cause for admission in Internal Medicine Services and on the other hand a cause of morbidity and mortality all over the world and in particular in our country.

At global level and in developed countries such as the USA and some Western European countries (France, Germany and Spain), CVDs have been the 3rd cause of death, being overtaken by neoplasms and ischemic cardiac diseases.

It is known the role CVDs represent as a cause of death in Portugal. As a matter of fact, in 1990, CVDs accounted for almost 1/4 of all deaths in the country (23.800 out of a total of 101.161 deaths). On the other hand, and different from most developed countries, in Portugal deaths caused by CVDs are considerably more frequent than those caused by ischemic cardiopathies than in 1990 caused 9,374 deaths (9.3% out of the total deaths). The importance of such pathologies is still highlighted by the fact of being in the origin of many more deaths than all the malignant neoplasms together which accounted for 18,751 deaths (18.5% out of total deaths). From this, it can be ascertained that CVDs represent the main cause of death in Portugal.

Also, in our country, the geographic distribution of mortality by CVDs is not uniform. Higher rates were reported in Viana do Castelo, Vila Real, Viseu e Leiria districts.

In Madeira, an island with around 300 thousand

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TABLE I

Cerebrovascular Diseases: distribution by gender

Gender	No. Patients	%
Male	621	45.2%
Female	752	54.7%

CVD studied = 1,373

inhabitants, around 500 people die yearly due to CVDs. Luckily in the last few years and in spite of this desolating situation, it is seen at global level a reduction in mortality rates by CVDs, what, at least in part is due to the efforts developed in prevention programs and control of risk factors associated to these diseases, namely diabetes, hypertension and dyslipidaemia, to an early diagnosis and treatment but also and undoubtedly due to the introduction of new drugs in the therapy of these patients as it is the case of nimodipine, slow calcium channel blockers from the dihydropyridine group whose efficacy is being proven at the level of subarachnoid hemorrhage and more recently many studies are being carried out in order to prove its action on ischemic CVDs.

In our service and since 1992 we have introduced this drug in the therapy of our patients in the dose of 240mg P.O./day in subarachnoid hemorrhage and 120mg P.O./day in ischemic CVDs.

Material and methods

Medicine I Service is one of 3 Internal Medicine services in Funchal Hospital Centre. It is made up by 48 beds, 24 in the men sector and 24 in the women's. Patients are admitted both through the Emergency Service as from the External Consultation.

The yearly admission average is of 1000 patients.

Out of the 8,300 in-patients in our service in the mentioned time frame, were reviewed the clinical files of 1,373 patients with a CVD diagnosis. Such number represents 16.5% of the total.

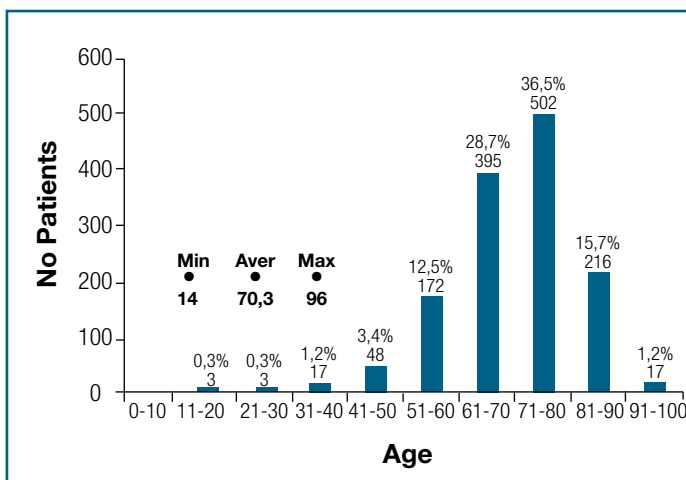
Consulting the clinical files of these 1,373 patients the following endpoints were assessed:

- Distribution by gender and age;
- Distribution by county;
- Distribution by years and seasons;
- Risk factors;
- CVD location;
- CVD types;
- Admission days;
- Morbidity and mortality.

Results

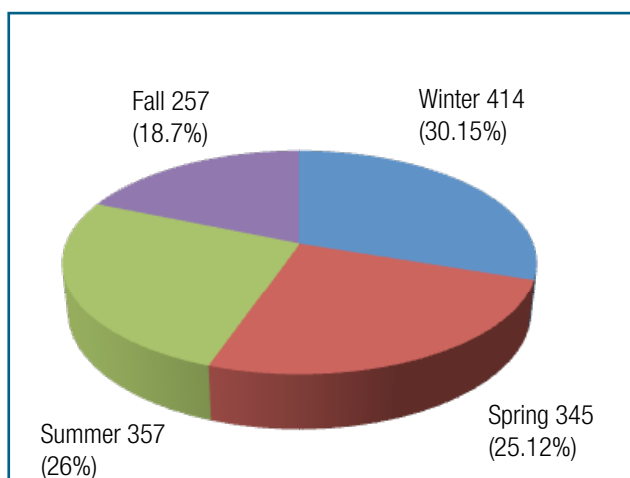
The total number of patients admitted with CVD was 1,373, being 621 of male gender (45.2%) and 725 of female gender (54.7%), (Table 1).

Their average age was 70.3 years, being its age



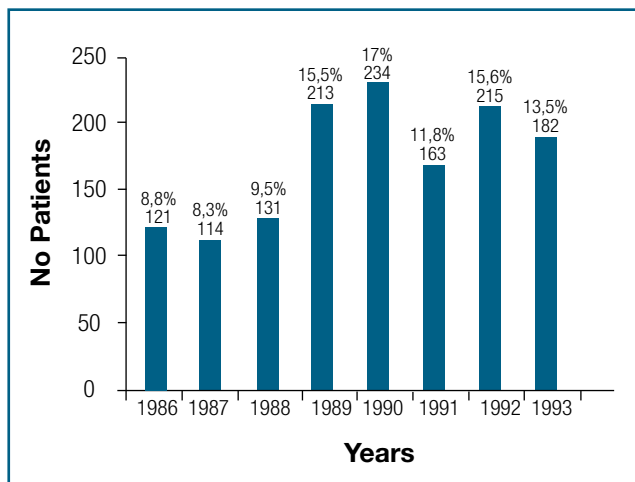
Cerebrovascular Diseases: Distribution by age.

FIG. 1



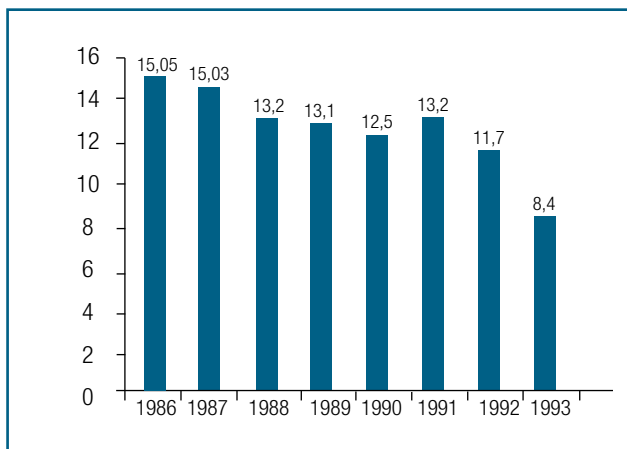
Cerebrovascular Diseases: Distribution by season.

FIG. 2



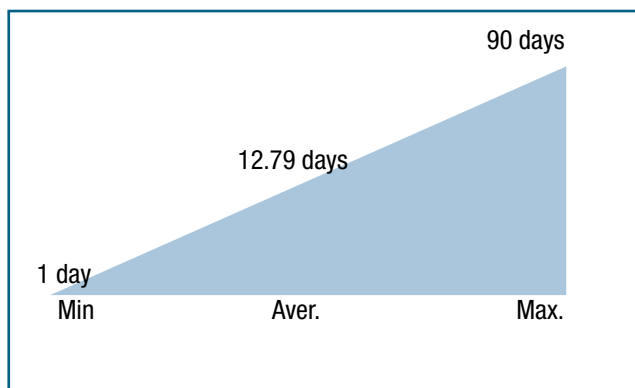
Cerebrovascular Diseases: Distribution by years.

FIG. 3



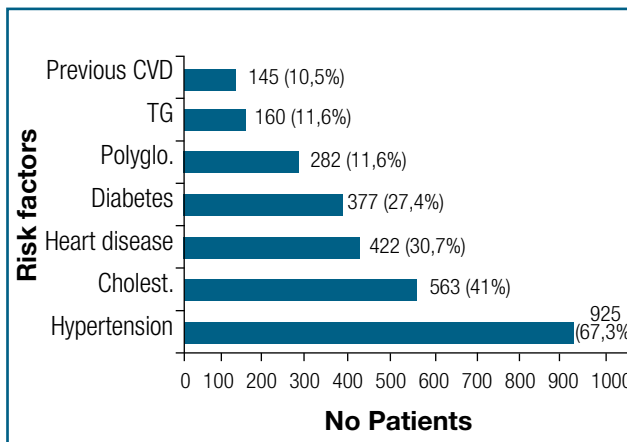
Cerebrovascular Diseases: Average admission time.

FIG. 5



Cerebrovascular Diseases: Days of admission.

FIG. 4



Cerebrovascular Diseases: Risk factors.

FIG. 6

distribution the one presented in Fig. 1.

It is described in Fig. 2 the distribution of cases by season of the year and it is observed a higher frequency in the winter months. Regarding the yearly distribution, in 1990 and in 1992 were admitted a bigger number of patients with CVDs (Fig. 3).

Most patients came from the counties with a higher population density, Funchal and Camara dos Lobos.

The average admission days was of 12.79 days, from a minimum of 1 day to a maximum of 66 days (Fig. 5). As can be seen in Fig. 5 there was a reduction on the average hospitalization time from 1986

to 1993, more evident from 1992 onwards.

The individual risk factor found with more frequency in these patients has been hypertension in 67.3%, followed by hypercholesterolaemia in 41%, cardiac pathology in 30.7%, diabetes mellitus in 27.4%, polyglobulia in 20.5%, hypertriglyceridaemia in 11.6% and lastly, previous CVDs in 10.5% of patients (Fig. 6).

Detailing the cardiac pathology found in these patients we verified that 208 patients presented auricular fibrillation, 125 valvular pathology, 76 ischemic cardiopathy and 15 cardiac blockades (Fig. 7).

Considering the association with risk factors found

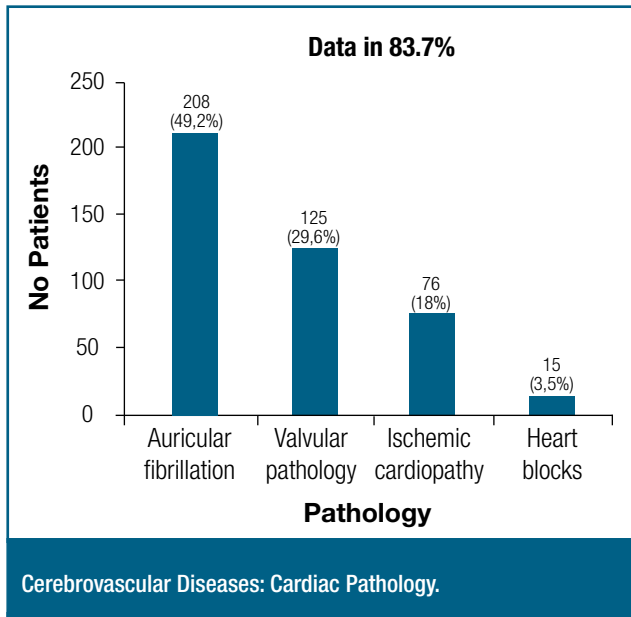


FIG. 7

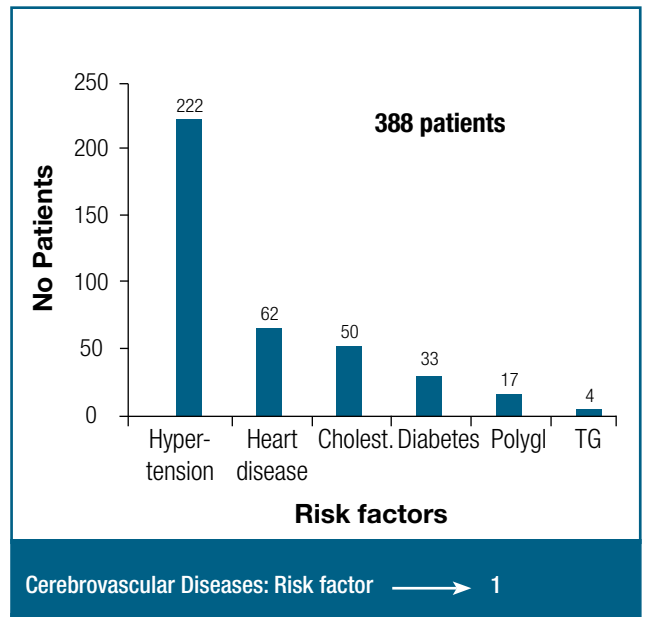


FIG. 9

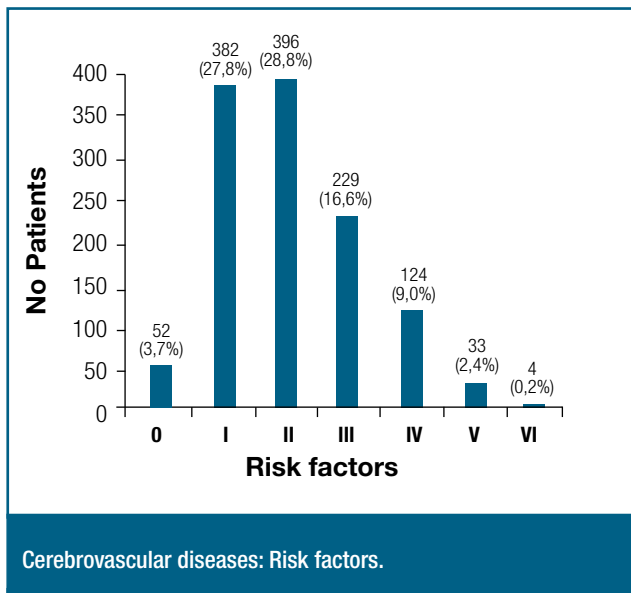


FIG. 8

in each patient, 27.8% presented a risk factor, 28.8% two associated risk factors, 16.6% three risk factors, 9% four risk factors, 2.4% five and 0.2% six factors (Fig. 8). Detailing the factors previously described and referring the patients who had only a risk factor, we detected that most of them had hypertension – 222 patients and in less number, cardiac pathology – 62 patients, hypercholesterolaemia – 50 patients, diabetes mellitus – 33 patients, polyglobulia – 17 patients

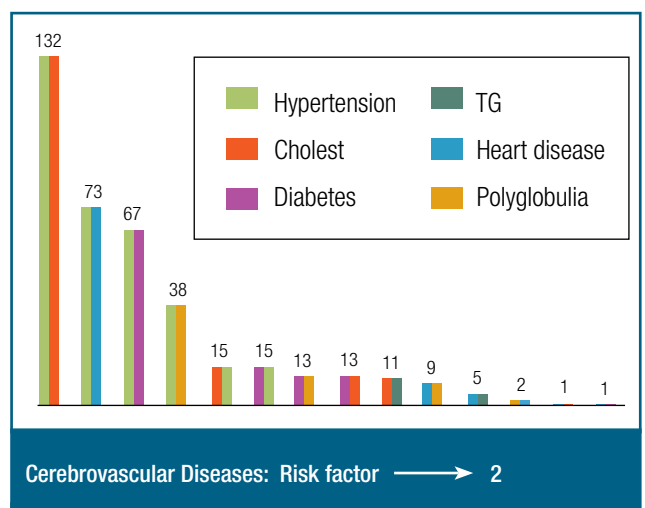
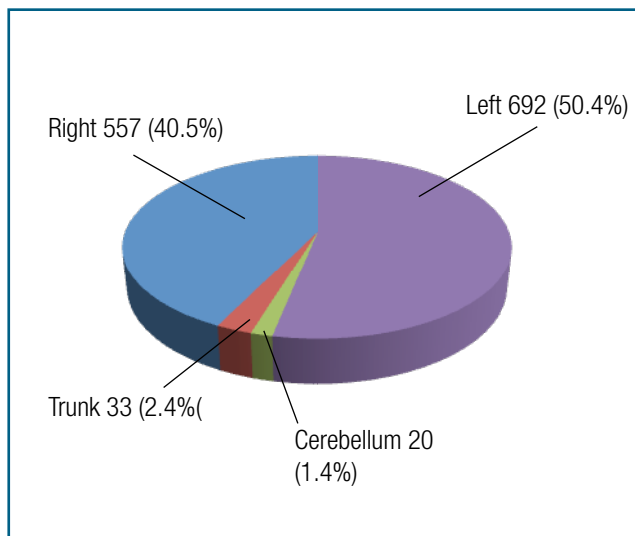


FIG. 10

and hypertriglyceridaemia – 4 (Fig. 9).

Regarding the association of 2 factors, most patients had hypertension associated to hypercholesterolaemia (132 patients), followed by hypertension associated to cardiac pathology (73 patients), hypertension associated to diabetes mellitus (67 patients), hypertension associated to polyglobulia (38 patients) (Fig. 10). Studying CVD through the cranial-encephalic CAT scan, the location found is more frequent on the left hemisphere with 692 patients (50.4%), followed by the right hemisphere with 557 patients



Cerebrovascular Diseases: Location.

FIG. 11

TABLE II

Cerebrovascular Diseases: CVD nature

Nature	No. patients	%
Hemorrhage	240	17.4%
Ischemic	1074	78.2%
?	59	4.2%

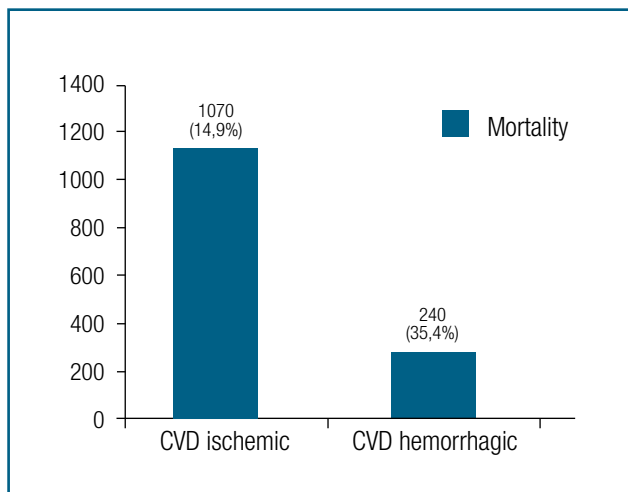
TABLE III

Cerebrovascular Diseases: Evolution

Evolution	No. patients	%
Without sequela	113	8.2%
With sequela	1014	73.8%
Deceased	246	17.9%

(40.5%), cerebral trunk with 33 patients (2.4%) and lastly the cerebellum with 20 patients (1.4%) (Fig. 11). In most patients, a CVD was of ischemic etiology corresponding to 1074 patients (78.2%); the hemorrhagic etiology was verified in 240 patients (17.4%) and in 59 patients, it was not possible to ascertain the CVD nature (Table II).

Regarding the evolution, 1014 patients had sequela (morbidity = 73.8%), 113 patients without sequela



Cerebrovascular Diseases: CVD type/Mortality ratio.

FIG. 12

and 246 patients (17.9%) died (Table III). Regarding the mortality, the ischemic vascular accidents were responsible for 161 deaths (14.9% of the total ischemic CVDs) and the hemorrhagic by 85 deaths (35.4% of the total hemorrhagic CVD).

Fig. 12 shows the relation between the CVD type and mortality. Assessing the morbidity rate, throughout the many years of study (Fig. 13) we verify that this was kept more or less constant; excepting some oscillations which are not significant.

Regarding the mortality curve over the years (Fig. 14) it is to be highlighted a progressive reduction in the mortality rate more marked from 1992, going from 11.7% that year to 8.4% in 1993.

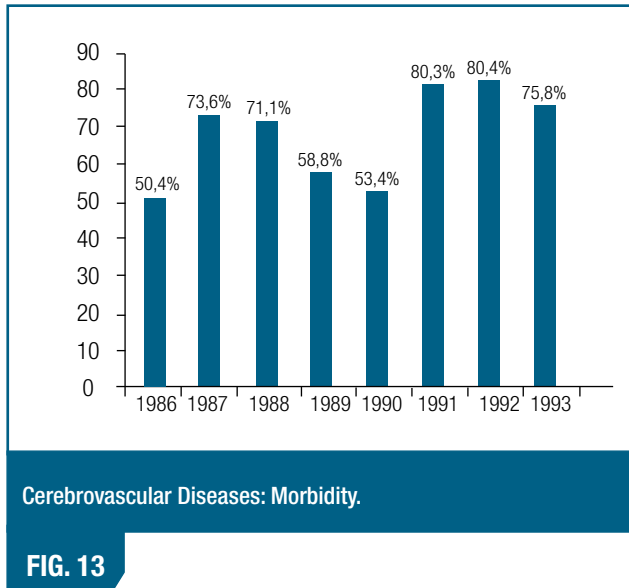
Discussion

The study we carried out, shows us that the number of patients admitted in our Internal Medicine Service by CVD, in the time frame referred was of 1,373, corresponding to 16.5% of all admissions in this service. It is the most frequent pathology found in hospitalized patients.

Female patients were in bigger number – 752, and the male gender 621, although there is not a significant difference.

As expected, the average age of these patients was high – 70.3 years – with a minimum age of 14 and a maximum of 96 years.

It is emphasized that most percentage of patients,



30.15% was admitted in the winter months, what probably it is related with more adverse environment conditions.

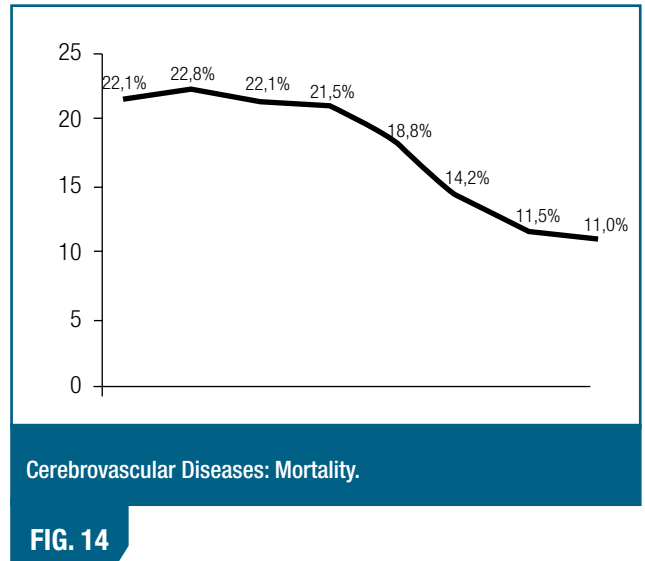
For reasons, unknown to us, it was seen a progressive increase on CVD admissions in our service from 1986 to 1990. From 1991 to 1993 there was not a significant oscillation in the number of hospitalized patients due to this pathology.

The more significant risk factors found in our patients were and by decreasing frequency order, hypertension, hypercholesterolaemia, cardiac pathology, diabetes mellitus, polyglobulia, hypertriglyceridaemia and by last the previous CVDs. We think we can deduct from the results we got in our study, that factor of hypertension risk is more important that all the others, whether isolated, whether associated to other factors, namely hypercholesterolaemia, cardiac pathology, diabetes mellitus and polyglobulia.

We also point out the fact that an almost equal number of patients presented or an isolate risk factor or two associated factors and in a lesser percentage three, four, five and six associated risk factors.

The kind of cerebrovascular disease verified in most patients was ischemia in 78.2%.

This work showed that the age, arterial hypertension, dyslipidaemia, diabetes mellitus, polyglobulia and heart disease were important factors for the CVDs. Thus, we can conclude that if we can control these risk factors we will be contributing to reduce the frequency of this pathology.



In our study we verified that in spite of increasing the morbidity, there was a reduction both in the average admission length of time, as in the more evident mortality from 1991 onwards. A possible explanation for this result can be the fact of also from this date, it has been introduced in the service a nimodipine in the therapy of these patients. In fact, the nimodipine action is double, vasodilating and cellular protection against ischemia.

In spite of the progression made at level of prevention and treatment, CVD keeps on being a clinical entity with high morbidity and mortality.

We are aware that apart of using calcium antagonists, other steps are needed to get a bigger reduction in mortality and morbidity associated to this disease. Such steps include a bigger control on risk factors, an earlier diagnosis, a more interventionist action, easy access to the several diagnosis supplementary methods, and still, the use in combination of calcium antagonists of other cell protection drugs (glutamate antagonists and free radicals). ■

References

1. Di-Lasci, Salivini S, Nimodipine in ischemic cerebroopathy – Clin Ter 1993 Feb; 142(2): 123 (6)
2. Direcção Geral de Saúde. Risco de morrer em Portugal. Lisbon (several years)
3. Adams Jr HP, Love BL, Radical management of aneurysmal subarachnoid hemorrhage. Stroke 2nd edition, 1992: 1029-1048
4. Falcão JM, Doença cerebrovascular em Portugal. Alguns dados epidemio-

lógicos. Feb. 1992. Epidemiologia – Direcção Geral de Saúde

5. Grotta CJ, Pharmacologic Modification of acute cerebral ischemic. Stroke 2nd edition.

6. Coronna JJ, Cerebrovascular diseases. Kelley Textbook of Internal Medicine 2nd Edition – 1992 – Chap 458: Pg 2161 – 2168

7. Ferro JM, Canhão P, Melo TP, Campos JG, Trindade A, Antunes JL, Nimodipina na hemorragia subaracnoidea. Addendum to Acta Médica Portuguesa 1991, 4: 138-140

8. Kistler J Philip, Roper Allan A, Martin Joseph B, Cerebrovascular diseases. Harrison's Principles of Internal Medicine, 1991, 351:1977 – 2002

9. Mohr JP, Meta – Analysis of oral nimodipine trials in acute ischemic stroke. New York Neurological Institute Cerebrovascular Diseases. 1993, August 9, 264: 1 – 14.

10. Lees KR, Therapeutic interventions in acute stroke BR J Clin – Pharmacol, 1992; Dec. 34 (6); 486 (93)

11. Nadir J; Bogousslavsky J, Treatment of acute cerebral infarction Curr. Opin. Neurol. Neurosurg., 1993; Feb. 6 (1); 51-4

12. WHO – World Health Statistics Annual Genève (several years)

13. Wolf Philip A, Cobb Janet L., D'Agostino Ralph B, Epidemiology of stroke. Stroke 2nd edition, 1992: 3 – 25

14. Stephen E Nadeau, MD. Stroke, Geriatric Medicine Medical Clinics of North America 1989; 73(6):1351-1369

15. The American Nimodipine Study group. [Published erratum appears in stroke 1992 Apr.23 (4): 615] Clinical trial of nimodipine in acute ischemic stroke 1992 Jan; 23 (1) 3-8.