



Ischemic stroke: complication of hypertension in hospital west of Almeria in Spain

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Abstract

Objective: The aim of this paper was to analyse the etiologic, clinical, and therapeutic characteristics of the ischemic stroke in the comarca of Poniente, Almería, Spain.

Methods: An observational descriptive study was carried out from June 2005 to June 2006 in the Hospital of Poniente. We studied 243 patients admitted to Internal Medicine Department diagnosed with ischemic stroke. We revised the clinical histories of patients using social, demographic, clinical, diagnostic, and therapeutic variables. A descriptive analysis of the variables was performed using SPSS V10.1 package.

Results: A total of 172 patients (70.7%) were admitted to hospital. The time course of the stroke episode was less than 6 hours (40.6%); mean age of patients 73 years (50% males) ; 94% were autochthonous workers, 6% immigrants, 72% hypertensive, and 35% had a history of previous stroke. The most common symptom was dysarthria (59%); brain CAT scan was performed in all of them within 6 hours after stroke onset, and antiplatelet drugs were given within 48 hours after stroke onset. About 30% of the patients received early rehabilitation, 12% died within the first week.

Conclusion: We found clinical and epidemiologic characteristics similar to those reported in the literature; we found a lower incidence of CVD and a higher time course than the national average.

Keywords: Hypertension, Stroke, Symptoms, Risk factors

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Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Introduction

Cerebrovascular disease (CVD) is a transient or permanent acute dysfunction of the brain produced by ischemic or hemorrhagic mechanisms. Terminology and classification has been established according to the etiology of stroke [1,2]. There are common terms such as asymptomatic cerebrovascular disease, transient ischemic stroke, ischemic stroke or cerebral infarction, stable cerebral infarction, stroke in evolution, or reversible ischemic neurologic deficit. It is also noteworthy to mention other terms such as brain hemorrhage, focal global cerebral ischemia (transient ischemic stroke and cerebral infarction); cerebral hemorrhage

(intracerebral, subarachnoid, or intraventricular), subdural or extradural hematoma. Epidemiologic analysis established quantification of the risk factors that could help increase the incidence of CVD [3,4], such as age [5], gender [6], hypertension [7], and history of previous heart disease [8] (Table 1).

In Spain, stroke is the primary cause of death in woman, and overall the second one after ischemic heart disease. It is also the main responsible factor for severe disability in adults, followed by dementia [9-11]. In Europe, the average cost per patient -year was about € 5,400; there are other social costs probably more important than those concerning health,



such as costs of disability, rehabilitation, and need for care [12,13].

Primary prevention of stroke by the control of modifiable risk factors is one of the most efficient measures to reduce the incidence and prevalence of CVD [14,15]. It is especially important the early diagnosis of acute episodes of the disease, by the therapeutic window of 3-6 hours post onset of stroke symptoms during penumbra period [16,17], then reducing functional sequelae and the high socio economic impact of stroke [18-20].

The aim of this study was to know the clinical, epidemiological and therapeutic characteristics of ischemic acute CVD in the comarca of Poniente (Western) of the province of Almería, since this region has a special population profile; there is a prevalence of young population and the increasing presence of immigrants from African countries.

Patients and Methods

Design

An observational cross-sectional study about the incidence of patients with ischemic CVD was conducted between June 2005 and June 2006. We reviewed the clinical histories of all patients admitted to the Emergency Room with the suspicion of stroke, and those subsequently admitted to Internal Medicine or Intensive Care Unit of the Poniente Hospital. The authors received consent from all participants.

Data collection

Only clinical and analytical data were obtained at the moment of consultation. No other data from other medical specialties (ophthalmology, otolaryngology,

or gynecology) were collected. In order to minimize biases, variables were collected only by one of the authors. CAT scan results were the last revised data in all cases. Microsoft Access 2000 was used for data processing and statistical analysis, in accordance with the Spanish Law 15/1999 of Data Protection of Personal Character, and the Spanish Law 41/2002 regulating Patient Autonomy and Health Documentation and Information-Related Rights and Obligations. Dissociation data were always used.

The study was carried out at the Emergency Department attached to the Integrated Area of Critical Care Management of the Poniente Public Hospital in Almería, a first-level hospital of the Consejería de Salud, Junta de Andalucía (Andalusian Public Health System), El Ejido, Almería.

Cases

We studied 492 cases in a referral population of 250,000 individuals; of them, 172 were diagnosed as having acute ischemic stroke. The study included patients from the comarca of Poniente, in the Province of Almería, and also those from the Alpujarra in the Province of Granada, and other opposite municipalities of Granada. Patients with suspected acute stroke were usually treated by specialized doctors of Emergencies or resident doctors, and also by first-year doctors of other specialties. The following assessment and final admission of patients, if necessary, was determined by specialists in Internal Medicine or Intensive Care.

Inclusion Criteria

1. No age limit.

2. People going to the Emergency Room on one's own initiative, or referred from primary care or doctors of the Emergency Medical Services (DECU, 061).

3. Reason for consultation: deficient neurological symptoms or signs, lasting more than 24 hours, and later admission to the Internal Medicine Service or Intensive Care Unit.

4. Physical examination and initial complementary tests suggesting acute stroke.

5. Cranioencephalic CAT scan during diagnostic process.

Exclusion Criteria

1. Patients diagnosed with transient ischemic stroke.

2. Patients diagnosed with hemorrhagic stroke (they were referred to the Referral Hospital of Torrecárdenas Almería).

3. Cases of hemorrhagic stroke rejected for neurosurgery treatment.

Measures of Variables

Patients with the suspect of cerebrovascular disease went to doctor's office on one's own initiative or were initially evaluated at the Health Center or by the Emergency Unit (DCCU) of primary care or the Emergency Services (061) and then transferred to the Emergency Room of the Poniente Hospital. A study protocol was applied and the following variables were recorded: 1. Clinical history number of the patient; 2. demographic data: age, gender, country of origin; 3. Priority determined at the triage room; 4. Parameters reported by nursery specialized in triage (blood pressure, heart rate, temperature, baseline oxygen saturation pulse oximetry); 5. Language barriers during anamnesis interview; 6. Time lasted since symptoms onset; 7.



Adherence of professionals to the stroke code of the Unit; 8. Family medical history of the patient; 9. Personal medical history reporting all factors of vascular risk and baseline situation of the patient, and whether there was a history of previous stroke; 10. Symptoms; 11. Physical examination; 12. Blood testing: hemogram, biochemistry, coagulation; 13. EKG; 14. Chest X-ray; 15. Cranial CT scan; 16. To perform fibrinolysis or not; 17. Therapy in the Emergency Room or admission to Internal Medicine or ICU area; 18. Early rehabilitation; 19. Evolution of discharge and sequelae.

Statistical Method

Qualitative data were codified as dummy variables (presence, positive or pathological=1; absence, negative or normal= 2). Quantitative data were treated as continuous variables, and when necessary, cut points were established for categorization. We used measures of central tendency (mean, standard error of the mean), and dispersion (standard deviation, maximum and minimum), when variables were quantitative, and absolute and relative frequencies in qualitative variables. Variables with statistical significance in the multivariate analysis were assessed according to the regression coefficient (beta). In order to avoid the use of decimals, we rounded the numbers up. Regression model was applied to the patients included in the study population. Each patient obtained a score according to the number and assessment of clinical and analytical predictors they presented. Statistical analysis was performed using SPSS V10.1.

Deontological Code

The study was carried out according to the recommendations adopted by the 18th World Medical Association General Assembly, Helsinki, Finland, 1964, and then amended by the 59th General Assembly, Seoul, 2008, and by the Convention for the protection of human rights and dignity of the human being with regards to the application of biology and medicine.

Results

A total of 243 patients with acute cerebrovascular stroke were seen at the Emergency Room and Critical Care Unit (1% of the population); of them, 172 patients (71%) were admitted to the Internal Medicine Unit because of ischemic cerebrovascular disease (neurological deficit lasting more than 24 hours of ischemic origin) with an incidence of 69 per 100,000 individuals per year. We excluded patients with transient ischemic stroke (lasting less than 24 hours, and not admitted to hospital), and with hemorrhagic episodes (they were transferred to the referral health center to be treated at the Neurosurgical Service).

The mean time of evolution of the symptoms was less than 6 hours (therapeutic window) in 69 patients (40.6%). Mean age was 73 years with a standard deviation of ± 11.19 , and a range between 18 and 99 years. Only 2.7% of the group aged 18-50 years presented hemorrhagic stroke; stroke occurred in 38.4% of the group aged 51-65 years (50% hemorrhagic stroke and 50% ischemic stroke), and 58.9% of the group aged 66-99 years developed mainly (82%) ischemic stroke. Eighty-

six patients (50%) were males, and 162 (94%) were autochthonous. Hypertension was found to be the most frequent risk factor in 124 patients (72%), and 61 patients (35%) showed antecedents of a previous stroke event. About 59% of the patients presented dysarthria. Cranial CAT scan was performed in all of the patients within the first 6 hours of stroke onset, and antiaggregant therapy was administered before the first 48 hours. Early rehabilitation was applied in 52 cases (30%); 22 patients (12%) died within the first 4 weeks mainly caused by comorbidity.

Discussion

We found an incidence of stroke in the comarca of the Poniente of 98/100,000 individuals/year which is lower than that reported in the literature (250-500/100,000 individuals/year) [10-12]. It is well-known that age is a risk factor of stroke events affecting mainly to people older than 65 years [5]. In our case, there was a high percentage of young people, many of them were workers of the agriculture under plastic.

According to the scientific recommendations, the adequate therapeutic time for strokes is of less than 6 hours of evolution [16,17]. Recent studies reported that in Spain 50% of cases admitted to hospital accomplished the scientific recommendations [22,23]. We found that this percentage was found to be lower in our study-only 40% of our patients was in the therapeutic window. In our series we found a homogeneous distribution by gender (50% women, and 50% men). This is not in accordance with the literature, which is supposed to be higher in



men [6]. This finding could be explained by the high number of young immigrant men leaving from our study area, being the prevalence of the disease increased in old women. It is well-known that age is a risk factor of stroke in men and women, due to the increased incidence of atherosclerosis with age [4,5] (Table 1). It is remarkable as the predominant character of hemorrhagic stroke in young people. Hypertension is the most important risk factor reported in the literature, followed by diabetes, dyslipemia, arrhythmia, smoking habit, alcohol consumption, and obesity [3,4,7,8] (Table 2). Quality of life before the stroke event, as well as the history of previous stroke determines the therapeutic attitude and later evolution of the patient, as reported in other studies [11,24,26]. In our case, we observed in a group symptoms similar to those reported by other authors [27] (Figure 1). Our Unit per-

formed systematically cranial CAT scan within the first 6 hours of admission to Emergency Room, then accomplishing the quality norm [28] (Figure 2). Anti-aggregation therapy was also performed systematically within the first 48 hours after stroke onset [29]. About 30.2% of our cases received early rehabilitation, which was lower than that reported in the literature (40%). However, it could be not clearly documented in the clinical history of patients. Functional recovery of patients in our case was similar to that reported in previous studies (43.6% with partial stroke recovery); stroke-associated mortality was 12.8% [30].

Conclusion

No definite conclusions can be obtained from our results, because of the size of the sample and the characteristics of the study population. However, our study provides clinical, etiological, therapeutic

and evolutionary characteristics similar to those reported by other series in the literature.

However, a special condition was found in our study concerning characteristics of the comarca of Poniente (Western), such as a lower incidence of CVD due to the high percentage of young people in that area and a time course of symptoms higher than the national average, probably due to ignorance of stroke warning signs in a population with a

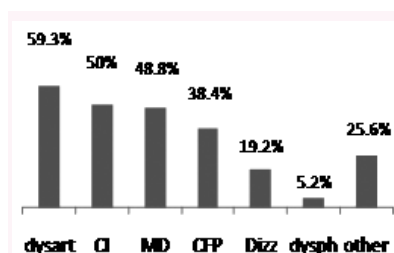


Figure 1. Presenting signs and symptoms of stroke in the comarca of Poniente, Almería. dysarth=dysarthria; CI= cognitive impairment; MD= motor deficit; CFP= central facial paralysis; Dizz= dizziness; dysph= dysphagia; other= cephalaea, nausea, vomiting, palpitations, thoracic pain

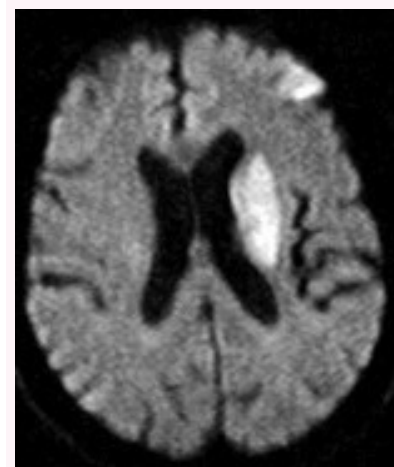


Figure 2. Image of ischemic stroke during "therapeutic window"

Table 1. Etiological prevalence of stroke according to age groups

Age group	Prevalence (%)	Hemorrhagic stroke (%)	Ischemic stroke (%)
18-50 yrs	2.7%	100%	0%
51-65yrs	38.4%	50%	50%
66-99yrs	58.9%	18%	82%

Table 2. Prevalence of cerebrovascular risk factors in the comarca of the Poniente of Almería, Spain.

Modifiable risk factors	Prevalence (%)
Hypertension	72.1
Diabetes	51.7
Dyslipemia	28.5
Arrhythmia	22.1
Tobacco use	20.3
Alcohol consumption (>5 drinks daily)	8.1
Obesity	5.8
Other uncommon or unknown risk factors	25.6



lower capacity of response to disease.

We observed in our sample that hypertension was a risk factor for the increased presence of hemorrhagic stroke among young people.

Our study accomplished professional adherence to protocol and quality norms (CAT indicators and anti-aggregation) of stroke, although the application of previous rehabilitation should be documented adequately in the clinical history of the patient in all cases.

Competing interests

The author(s) declare that they have no competing interests.

Acknowledgements

We want to express our gratitude to the Integrated Area of Critical Care Management, and Emergency Department, Internal Medicine Unit, Intensive Care Unit, Files Unit, Software Unit.

References

1. Arboix A, Álvarez-Sabin J, Soler L. En nombre del comité de redacción ad hoc del Grupo de estudio de enfermedades cerebrovasculares de la SEN, Ictus. Tipos etiológicos y criterios diagnósticos. *Neurología* 1998;13:4-10.
2. Ay H, Furic KL, Singhal A, Smith WS, Sorensen AG, Koroshetz WJ. An evidence-based causative classification system for acute ischemic stroke. *Ann Neurol* 2005;58:688-97.
3. Martínez Vila E, Irima P. Factores de riesgo del ictus. *Anales Sis San Navarra* 2000;2:25-32.
4. San Clemente Ansó C, Pedregosa Vall A, Rovira Pujol E. El ictus en manos del internista. Factores de riesgo cardiovascular. *Rev Clin Esp* 2008;208:339-46.
5. Jørgensen HS, Nakayama H, Pedersen PM, Kammergaard L, Raaschou HO, Olsen TS. Epidemiology of stroke-related disability. The Copenhagen Stroke Study. *Clin Geriatr Med* 1999;15:785-99.
6. Guallar P, Rodríguez-Artalejo F, Bane-gas JR, Lafuente P, Rey-Calero J. La distribución geográfica de la razón varon-mujer de la mortalidad cardiovascular en España. *Gac Sanit* 2001;15:296-302.
7. Banegas JR, Rodríguez-Artalejo F, Cruz JJ, de Andrés B, Rey Calero J. Mortalidad relacionada con la presión arterial y la hipertensión en España. *Med Clin (Barc)* 1999;112:489-94.
8. Castilla-Guerra L, Fernández Moreno MC, Álvarez-Suero J. Ictus cardioembólico. *Rev Clin Esp* 2012;210:127-32.
9. Instituto Nacional de Estadística, defunciones según la causa de muerte 2002. February 18th. Available from: <http://www.ine.es>.
10. Boix R, Del Barrio JL, Saz P, Rene R, Manubens JM, Lobo A, et al. Stroke prevalence among the Spanish elderly: an analysis based on screening surveys. *BMC Neurol* 2006;6:36.
11. Arboix A. Registros de enfermedades vasculares cerebrales. *Med Clin (Barc)* 2008;130:623-5.
12. Epstein D, Mason A, Manca A. The hospital cost of care for stroke in nine European countries. *Health Econ* 2008;17 (Suppl1):21-31.
13. Carod-Artal FJ, Egido JA, González JR, Varela de Seijas E. Coste directo de la enfermedad cerebrovascular en el primer año de seguimiento. *Rev Neurol* 1999;28:1123-30.
14. Goldstein LB, Adams R, Becker K, Furberg CD, Gorelick PB, Hademenos G, et al. Primary prevention of ischemic stroke. A statement for healthcare professionals from the Stroke Council of the American Heart Association. *Stroke* 2001;32:280-99.
15. Rigau Comas D, Álvarez-Sabin J, Gil Núñez A. Guía de práctica clínica sobre prevención primaria y secundaria del ictus. *Med Clin (Barc)* 2009;133:754-62.
16. Castillo J. Fisiopatología de la isquemia cerebral. *Rev Neurol*. 2000;30:459-64.
17. Bose A, Henkes H, Alfke K, Reith W, Mayer TE, Berlís A, et al. The Penumbra System: a mechanical device for the treatment of acute stroke due to thromboembolism. *AJNR Am J Neuroradiol* 2008;29:1409-13.
18. Martínez Villa E, Irima P, Urrestarazu E, Gállego J. El coste del ictus. *Anales Sis San Navarra* 2000;23:3-38.
19. Hervás A, Cabasés J, Forcén T. Coste del cuidado informal del ictus en una población general no institucionalizada. *Gac Sanit* 2007;21:444-5.
20. Fuentes B, Díez Tejedor E. Stroke unit: a cost-effective care need. *Neurología* 2008;22:456-66.
21. Di Carlo A, Launer LJ, Breteler MMB, Fratiglioni L, Lobo A, Martínez-Lage J, et al. Frequency of stroke in Europe: a collaborative study of population-based cohorts. ILSA Working Group and the Neurologic Diseases in the Elderly Research Group. *Italian Longitudinal Study on Aging. Neurol* 2000;54:S28-S33.
22. Álvarez-Sabin J, Molina CA, Abilleira S, Montaner J, García Alfranca F, Jiménez



- nez Fábrega X, et al. Impacto de la activación del Código ictus en la eficacia del tratamiento trombolítico. *Med Clin (Barc)* 2003;120:47-51.
23. Ministerio de Sanidad y Consumo. Estrategia en ictus del Sistema Nacional de Salud, 2008.
24. Lloyd-Hones D, Adams R, Carnethon M, De Simone G, Fergusn B, Flegal K, et al. Heart disease and stroke statistics 2009 update: a report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. *Circulation* 2009;119:480-6.
25. Kalra L, Crome P. The role of pronostic scores in targeting stroke rehabilitation in the elderly. *J Am Geriatr Soc* 1993;41:396-400.
26. Ustrell-Roig X, Serena-Leal J. Ictus. Diagnostico y tratamiento de las enfermedades cerebrovasculares. *Rev Esp Cardiol* 2007;60:753-69.
27. Vila N. Síndromes Neurovasculares. In: Castillo J, editor. *Ictus. Plan de formación en neurología 2000*. Madrid: Ergon; pp 23-31.
28. Alvarez Sabin J, Mostacero E, Molina C, Moltó JM. Guía para la utilización de los métodos y técnicas diagnósticas en el ictus. *Neurología* 2002;17:13-29.
29. Meller DM, Albright KC, Allison TA, Grotta JC. LOAD: a pilot study of the safety of loading aspirin and clopidogrel in acute ischemic stroke and transient ischemic attack. *J Stroke Cerebrovasc Dis* 2008;17:26-9.
30. Murie-Fernández M, Irimia P, Martínez-Vila E, Meller John Meller M, Teasell R. Neuror rehabilitación tras el ictus. *Neurología* 2010;25:189-96.

.COCHRANE UPDATES & NICE GUIDELINES .

SOCIAL AND EMOTIONAL WELLBEING - EARLY YEARS

This guidance aims to define how the social and emotional wellbeing of vulnerable children aged under 5 years can be supported through home visiting, childcare and early education. The term 'vulnerable' is used to describe children who are at risk of, or who are already experiencing, social and emotional problems and need additional support.

The guidance is for all those responsible for planning and commissioning children's services in local authorities (including education), the NHS and the community, voluntary and private sectors.

It also for: GPs, health visitors, midwives, psychologists and other health practitioners, social workers, teachers and those working in all early years settings (including childminders and those working in children's centres and nurseries).

The recommendations cover:

- Strategy, commissioning and review
- Identifying vulnerable children and assessing their needs
- Ante- and postnatal home visiting for vulnerable children and their families
- Early education and childcare
- Delivering services.

The recommendations:

- Adopt a 'life course perspective'
- Focus on social and emotional wellbeing as the foundation for the healthy development of vulnerable children and to offset the risks relating to disadvantage
- Aim to ensure universal, as well as more targeted, services provide them with additional support
- Should be used in conjunction with local child

(Source: NICE Public health guidance, PH40, October 2012; available at <http://guidance.nice.org.uk/PH40>)