

The cerebrovascular disease unit at Hospital de L'Aliança in Barcelona (1990)

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In memory of Professor Josep Lluís Martí i Vilalta, a pioneer in the systematic, protocolised study of cerebrovascular diseases.

ABSTRACT

Introduction. The purpose of this study is to analyse training and care provided by the cerebrovascular disease unit at Hospital de L'Aliança in Barcelona. Additionally, we will analyse the role played by this unit in Spain to determine whether it served as a prototype for current stroke units.

Methods. We conducted a literature search in the library of Hospital Universitari del Sagrat Cor and the authors' private documents to gather information on the creation and opening of the cerebrovascular disease unit at Hospital de L'Aliança.

Results. The cerebrovascular disease unit at Hospital de L'Aliança was created in January 1990 and opened its doors on 5 October 1994. This unit formed part of the neurology department, and it created a stroke registry published in 1993, which included 1000 consecutive patients admitted to hospital between 1986 and 1991. The cerebrovascular disease unit held clinical sessions twice monthly with experts from other institutions.

Conclusions. The cerebrovascular disease unit at Hospital de L'Aliança made systematic and protocolised use of a stroke registry to analyse and study clinical data associated with acute cerebrovascular disease. This unit may be regarded as the first stroke unit in Catalonia and Spain, and one of the pioneer institutions in stroke management along with the stroke units at Hospital Clínico San Carlos (1991) and Hospital Universitario La Paz (1995).

KEYWORDS

Stroke unit, cerebrovascular disease unit, history, cerebrovascular disease, stroke registry

Introduction

Stroke units have been shown to be useful for the management of stroke patients, especially after thrombolytic treatment was proven effective when administered to selected patients within the therapeutic window.^{1,2} However, little is known about the efforts that went into creating the first cerebrovascular disease units, pioneering endeavors with scarce resources which paved the way for our modern stroke units.

Stroke units appeared in the 1970s, initially in the form of intensive stroke care units; significant contributions were made by Pitner and Mance³ (1973), Drake et al.⁴ (1973), Millikan⁵ (1979), and Norris and Hachinski⁶ (1976). Given that the initial results from their studies were not conclusive, these units were transformed into non-intensive stroke care units during the 1980s based on the studies by Strand et al.^{7,8} (1985, 1986) and by Norris and Hachinski⁹ (1986). These later versions provided the basis for current acute stroke units, which have been

proved effective for clinical management of these patients.^{10,11}

The purpose of this study is twofold: firstly, to gather information on the organisation and launch of the cerebrovascular disease unit at Hospital de L'Aliança in Barcelona,¹² focusing on its contributions to clinical care, training, and research.

Secondly, we will verify whether this unit broke ground for stroke management in Spain and served as a model for current stroke units. Likewise, we address its relationship with the stroke units that began to emerge at other Spanish hospitals.

Material and methods

Using documents in the Hospital Universitari del Sagrat Cor and the authors' private collections, we conducted a literature search to gather information on the creation and launch of the cerebrovascular disease unit at Hospital de L'Aliança.

We also searched on PubMed using the keywords and Boolean operators "stroke unit" OR "stroke units" AND "Spanish" OR "Spain" to locate articles published between 1986 and 1996 and addressing the activity of other contemporary stroke units.

Furthermore, we consulted Marta Gloria Fabregas Camps' doctoral thesis "Història de la Neurologia a Catalunya. De l'any 1882 a l'any 1949",¹³ presented in 1992 at Universitat Autònoma de Barcelona. We also used primary historical sources selected from the library of the Academy of Medical and Health Sciences of Catalonia and the Balearic Isles in Barcelona, and analysed published articles and other documents (training programmes, clinical sessions, scientific reports, etc.) referring to the cerebrovascular disease unit at Hospital de L'Aliança in its early years (1990-1996).

Our findings are listed in the following section.

Results

General information about the cerebrovascular disease unit at Hospital de L'Aliança

The cerebrovascular disease unit was located on the second floor of Hospital de L'Aliança, in Carrer de Sant

**INAGURACIÓ DE LA
"UNITAT DE PATOLOGIA VASCULAR CEREBRAL"
DEL SERVEI DE NEUROLOGIA DELS HOSPITALS
DE BARCELONA DE L'ALIANÇA**



**Dia 5 d'Octubre de 1994 a les 13.00 hores
Sala d'Actes, 7ª planta. L'Aliança-Hospital Central,
Sant Antoni Mª Claret, 200**

Coordinador: Dr. A. Arboix

Figure 1. Programme for the grand opening of the cerebrovascular disease unit at Hospital de L'Aliança in Barcelona on 5 October 1994

Antoni Maria Claret in Barcelona; that building currently houses the Centro Sociosanitario Palau. This unit formed part of the neurology department and included approximately 12 beds in a total of 9 rooms arranged around an unusual circular corridor. This peculiar design was typical of modernist buildings such as the one housing this hospital. Two of these rooms were equipped for intensive monitoring of vital signs.

A rehabilitation and physiotherapy area was set up near the cerebrovascular disease unit and on the same floor, although not in the same corridor.

The stroke management team was formed by three expert neurologists (Drs Joan Massons, Montserrat Oliveres, and Adrià Arboix) whose main objective was to provide specialised care to stroke patients according to the hospital's management protocol. This unit also included specialised nursing staff and worked closely with the intensive care unit and the cardiology, neuroradiology, physiotherapy, vascular surgery, and neurosurgery departments.

Although the cerebrovascular disease unit at Hospital de L'Aliança was organised and operational as far back as January 1990, it was not officially opened to the public until 5 October 1994, after a preliminary internal study, later published in *Medicina Clínica*, had made the hospi-

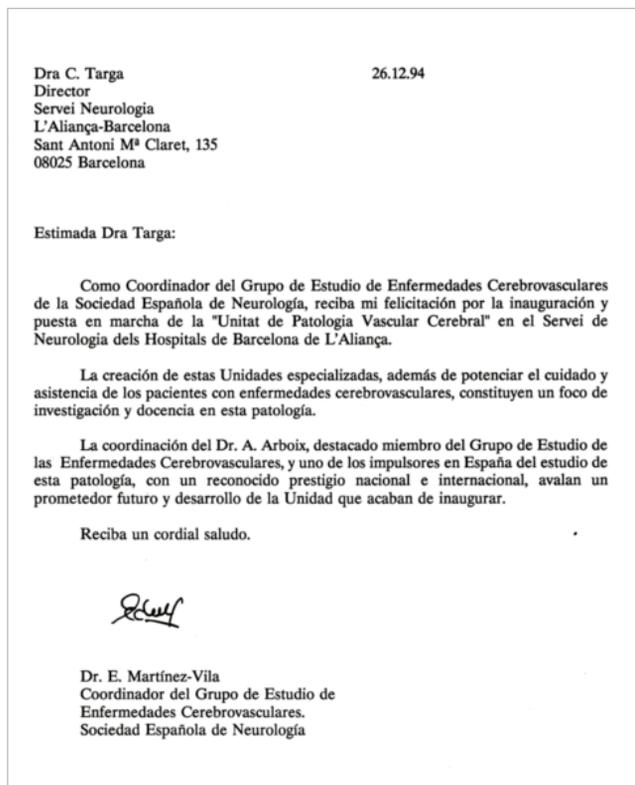


Figure 2. Letter by Dr Eduardo Martínez Vila, coordinator of the Spanish Society of Neurology's Cerebrovascular Disease Study Group, congratulating Dr Cecilia Targa, director of the neurology department at Hospital de L'Aliança, on the occasion of the grand opening of the cerebrovascular disease unit

tal's medical directors aware of the clinical benefits provided by this unit.¹⁴ The cerebrovascular disease unit was inaugurated in a ceremony held at the hospital's assembly hall. The distinguished figures invited to the ceremony included Dr Feliu Titus and Professor Josep Lluís Martí i Vilalta, both former presidents of the Catalan Society of Neurology (Figure 1). At that time, Dr Miquel Balcells was the head of the neurology department, Dr Cecilia Targa managed the neurology department, and Dr Adrià Arboix was the coordinator of the cerebrovascular disease unit. On 2 November 1994, the hospital's medical directorate confirmed the unit's status as part of the department of internal medicine, although dependent on the neurology department at Hospital de L'Aliança.

Dr Jordi Pascual, president of the Catalan Society of Neurology at that time, and Dr Eduardo Martínez-Vila, president of the Spanish Society of Neurology's Cerebrovas-

cular Disease Study Group, were informed about the inauguration of the unit and invited to the event. Dr Martínez-Vila's courteous answer appears in (Figures 2 and 3). A short piece about the launch of the cerebrovascular disease unit was also published in *Revista de Neurología* in 1995 (Figure 4).¹² The first trial to be conducted in this unit was an international multicentre randomised placebo-controlled clinical trial of the neuroprotective drug clomethiazole during the acute phase of cerebral ischaemia (CLASS study).¹⁵

Management of the patients admitted to the cerebrovascular disease unit followed the treatment guidelines published by the Catalan Society of Neurology¹ and recommendations made by the Spanish Society of Neurology's Cerebrovascular Disease Study Group, created in 1989 and initially coordinated by Dr Martí i Vilalta.¹⁶

Training at the cerebrovascular disease unit

The cerebrovascular disease unit at Hospital de L'Aliança implemented a hospital registry that included all patients admitted due to stroke. It was based on a preliminary registry used by Professor Martí i Vilalta at Hospital de la Santa Creu i Sant Pau, Barcelona.¹⁷ The registry recorded a total of 186 items including demographic data, cerebrovascular risk factors, semiological data, data on parenchymal and arterial cerebrovascular topography, stroke aetiology and subtype, neurological and non-neurological complications, and focal neurological signs at discharge. Results from the study of the first 1000 consecutive patients to be entered in the registry were pub-

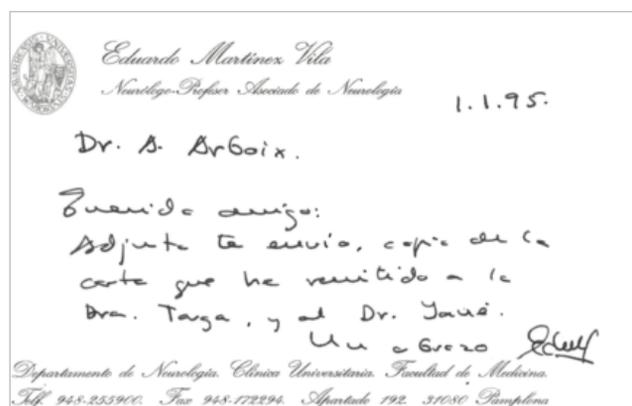


Figure 3. Dr Martínez Vila's note to Dr Arboix, dated 1 January 1995 and accompanying a copy of the letter he had sent to Dr Cecilia Targa

Inauguración de una 'Unidad de Patología Vascul ar Cerebral' en el Servicio de Neurología del Hospital Central de la Alianza

Siguiendo las recomendaciones del Grupo de Estudio de Las Enfermedades Cerebrovasculares de la Sociedad Española de Neurología [1], el Servicio de Neurología del Hospital de la Aliança de Barcelona, ha inaugurado en fecha 2 de noviembre de 1994, una 'Unidad de Patología Vascul ar Cerebral' (PVC), con un triple objetivo asistencial, docente y de investigación clínica. Es de esperar, que dicha unidad constituya una herramienta útil para proseguir la línea de estudio en PVC emprendida hace siete años, y que cristalizó en la publicación del registro de ictus de nuestro hospital [2].

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REV NEUROL (Barc) 1995; 23 (119): 227-236

Figure 4. Short notice about the launch of the cerebrovascular disease unit at Hospital de L'Aliança, published in *Revista de Neurología* in 1995¹²

lished in *Medicina Clínica*¹⁸ in 1993; this article analysed the patients hospitalised between 1986 and 1991. The registry performed three functions: its primary function was for patient management and general information, but it was also used in clinical research and training. In fact, one of the main objectives of the cerebrovascular disease unit was to train medical students, residents, nursing staff, general practitioners, emergency care professionals, and other specialists.

At the same time, Hospital de L'Aliança held clinical sessions twice a month, inviting experts from other institutions; these sessions are a tradition that continues to this day (Figure 5). In 2005, to commemorate the 10th anniversary of the grand opening of the cerebrovascular disease unit, *Neurología*¹⁹ published a supplement co-authored by many of the experts who had been invited to the unit's clinical sessions (Figure 6).

Hospital de L'Aliança's neurology department was relocated to Hospital Universitari del Sagrat Cor in 1997. However, the unit was still managed by the same stroke team, its registry of cerebrovascular diseases was maintained, and it continued to hold clinical sessions twice a month. At this point, the Catalan Society of Neurology started to promote these sessions.

In 2004, this hospital registry's stroke database was awarded the prize for 'Best Medical Idea 2004' by *Diario Médico*, the medical newsletter.

Systematic search for literature about Spain's first stroke units

Our systematic PubMed search using the keywords and Boolean operators "stroke unit" OR "stroke units" AND "Spanish" OR "Spain" for the period 1986-1996 yielded seven articles.²⁰⁻²⁶ Four were excluded since they were review articles or editorials; of these, three were published in *Revista de Neurología*²³⁻²⁵ and the fourth in *Revista Clínica Española*.²⁶ The three original articles that remained were included.²⁰⁻²² Two of them were studies presented by the cerebrovascular disease unit at Hospital de L'Aliança in Barcelona, published in *Stroke*²¹ and the *European Journal of Neurology*²⁰ in 1995. The remaining study was published in *Revista de Neurología*²² that same year and described the initial experience in the stroke unit at Hospital Clínico San Carlos, which had begun to operate in November 1991. According to an article published in *Cerebrovascular Diseases*²⁷ in 2006 by a research group

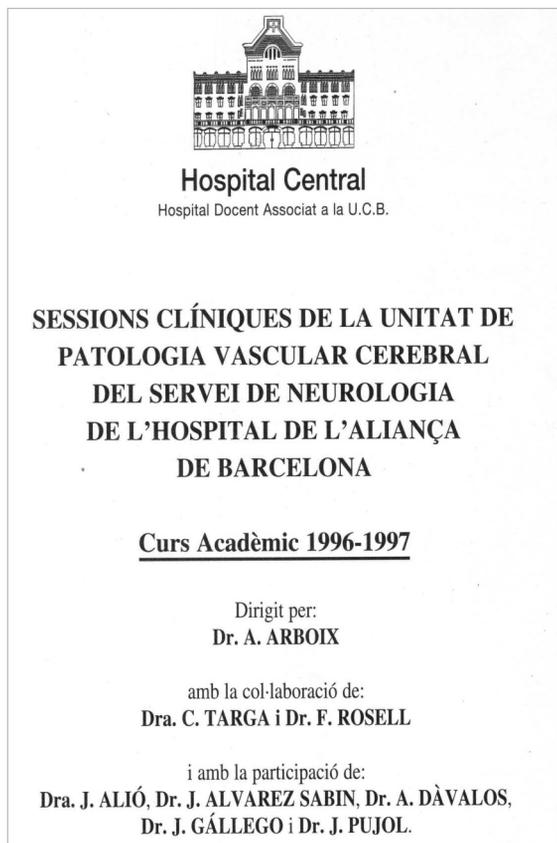


Figure 5. Front page of the programme of clinical sessions held at the cerebrovascular disease unit of Hospital de L'Aliança during the 1996-1997 academic year

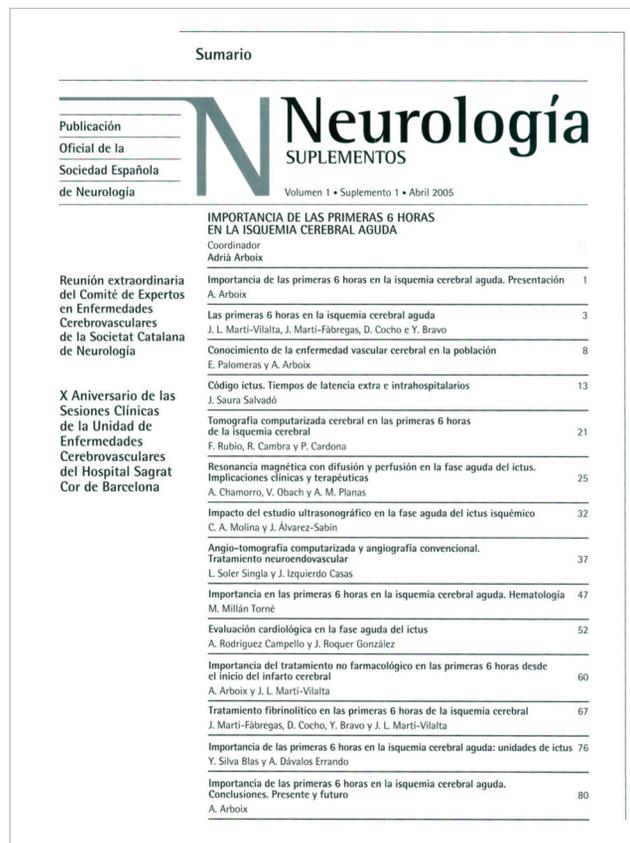


Figure 6. First page of the supplement published in *Neurología* in 2005, on the occasion of the 10th anniversary of the launch of the cerebrovascular disease unit at Hospital de L'Aliança and the clinical sessions the unit presented twice a month¹⁹

from Hospital Universitario La Paz, that hospital's stroke unit had been inaugurated in 1995 (Table 1).

Discussion

At present, most diagnostic and treatment guidelines for cerebrovascular diseases stress the importance of stroke units based on evidence that care in these units is associated with better outcomes in terms of lower frequency and severity of neurological sequelae and lower in-hospital mortality rates.^{1,2}

Nonetheless, we should point out that, establishing these units was not an easy task, since evidence of their effec-

tiveness was based only on preliminary models at a time when conclusive data were still lacking. A great deal of enthusiasm and willpower was therefore necessary to create, develop, and consolidate these units.

Stroke units were at first modeled after coronary care units. However, they subsequently ceased to provide intensive care and focused on intermediate care, characterised mainly by systematic multidisciplinary patient management by specialised healthcare professionals.

The cerebrovascular disease unit at Hospital de L'Aliança was a pioneer in stroke care; active since January 1990, it held its grand opening in 1994, becoming the first stroke unit in Catalonia and one of the first in Spain, along with

Table 1. First stroke units in Spain (1986-1996)*

Hospital	Year	Publications
Hospital L'Aliança (Barcelona) 1990**		<i>Rev Neurol</i> ¹² (1995)
		<i>Stroke</i> ²¹ (1995)
		<i>Eur J Neurol</i> ²⁰ (1995)
Hospital Clínico (Madrid)	1991	<i>Rev Neurol</i> ²² (1995)
Hospital La Paz (Madrid)	1995	<i>Cerebrovasc Dis</i> ²⁵ (2006)

*Results yielded by a systematic literature search of Pubmed using the following keywords and Boolean operators: "stroke unit" OR "stroke units" AND "spanish" OR "Spain", date range, 1986 to 1996.

**Grand opening held in 1994.

those at Hospital Clínico San Carlos (1991)²² and Hospital Universitario La Paz (1995).²⁵ This unit was created with a threefold purpose: patient care, training, and research.

From a patient care viewpoint, the cerebrovascular disease unit applied a homogeneous treatment protocol. Antithrombotic treatment was adapted to each patient depending on the aetiology of cerebral ischaemia. The unit also applied a protocol to reduce those clinical situations in acute phase of stroke that may worsen functional outcomes. Measures included avoiding intravenous sugar solutions, providing early treatment of hyperthermia and infections, controlling initial hyperglycaemia, administering standard prophylactic treatment for deep venous thrombosis, and indicating early motor and pulmonary rehabilitation. This protocol adhered strictly to the ground-breaking recommendations of the Spanish Society of Neurology's Cerebrovascular Disease Study Group, created in 1989, and to treatment guidelines published by the Catalan Society of Neurology. Until then, stroke patients had been admitted either to the department of internal medicine, where they were treated by specialists other than neurologists (who consulted with the neurology department at some point during the patient's hospital stay); or to the neurology department, where patients were treated by general neurologists who were not specialists in stroke management.

One of the key factors in establishing the cerebrovascular disease unit at Hospital de L'Aliança was the introduction and promotion of stroke registries, databases in which patients' clinical variables are collected and recorded. Our unit adopted the model of the registry for hospitalised patients used at Hospital de la Santa Creu i Sant Pau in

Barcelona. This registry, created by Dr Martí i Vilalta, was the first hospital registry in Spain.¹⁷ Minor changes were applied to this registry to fit the purposes of the cerebrovascular disease unit; however, the modified registry and the original one were essentially similar and compatible. As a result, data from both registries were combined and analysed together, and the results of this study were published in *European Neurology* in 1999.²⁸ Known as the Barcelona Stroke Registry, this combined database was the first multicentre stroke registry in Catalonia and Spain. In 1986, J.P. Mohr²⁹ became the first author to recommend the use of stroke registries in neurology departments to gain a more in-depth knowledge of the natural history of stroke and thus be better able to identify unusual clinical cases that few doctors had witnessed. Registries help researchers identify selected cases and combine them with those reported by other authors to create larger series of patients with rare clinical features, which provides additional knowledge about the clinical features, course, and natural history of stroke.

In 1998, *Medicina Clínica* published a study comparing the first 1000 stroke patients receiving care at the cerebrovascular disease unit at Hospital de L'Aliança between 1986 and 1990 to the subsequent consecutive 1000 stroke patients (1991-1995). The second group showed shorter hospital stays and lower in-hospital mortality, which confirmed the usefulness of implementing stroke management protocols in a specialised stroke unit. In light of these preliminary results, the hospital's medical directorate approved holding a grand opening of the cerebrovascular disease unit at Hospital de L'Aliança toward the end of 1994.

Regarding training activities, this unit also hosted clinical sessions twice a month. Sessions were taught by stroke experts, mainly neurologists, from other institutions. However, given the multidisciplinary nature of this unit, a variety of other specialists also participated: neurosurgeons, vascular surgeons, neuropsychologists, neuroradiologists, specialists in rehabilitation medicine, cardiologists, experts in experimental medicine, geneticists, biochemists, and epidemiologists. Although speakers usually came from Catalan hospitals (Barcelona, Tarragona, Girona, and Lleida), experts from hospitals in other parts of Spain were also invited (Madrid, Pamplona, Santiago de Compostela, Seville, Alicante, Valladolid, and Albacete).

From a historical viewpoint, the creation of the cerebrovascular disease unit at Hospital de L'Aliança was a

small milestone in the history of Catalan neurology in general, and particularly in the study of cerebrovascular diseases, which began with classical studies by pioneer Catalan researchers at the beginning of the 20th century. Dr Bartomeu Robert i Yarzabal (1842-1902),³⁰ a renowned internal medicine specialist and mentor to Dr Lluís Barraquer i Roviralta, was deeply interested in neurological and cerebrovascular diseases. Dr Artur Galcerán i Granés (1850-1919), who in 1911 became the founder and first president of Spain's first neurological society (the Barcelona Society of Psychiatry and Neurology),^{31,32} published numerous studies on cerebral circulation. Dr Lluís Barraquer i Roviralta (1855-1928), a pioneer of clinical neurology in Catalonia and Spain and founder in 1882 of the country's first neurology department at the old Hospital de la Santa Creu in Barcelona,³³ also studied stroke patients. However, it was Dr Josep Falp i Plana (1873-1914), a doctor to poet and priest Mossèn Cinto Verdguer, who paved the way for clinical and epidemiological stroke research³⁴⁻³⁶ with his topographical study of stroke (feridures in Catalan) in Solsona and other nearby villages in Lleida.^{35,36} This study was published in 1901 and commended by the Academy of Medical and Health Sciences of Catalonia and the Balearic Isles.

In summary, the cerebrovascular disease unit at Hospital de L'Aliança in Barcelona, created in 1990 and officially inaugurated in 1994, was the first stroke unit in Catalonia and Spain and it served as a model for our modern stroke units. Its salient features were use of protocolised multidisciplinary care and hospital stroke registry, as well as the bimonthly clinical sessions led by experts from other Spanish institutions.

Conflicts of interest

The authors have no conflicts of interest to declare.

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