Are Hospital Costs for Stroke Underestimated in Spain?
CONOCES Study

CONOCES

Álvarez-Sabín J[1], Masjuan J[2], Yébenes M[3], Mar J[4], Oliva J[5], González-Rojas N[6], Becerra V[6], Casado MA[3], CONOCES Study Investigators

[1]Hospital Vall D' Hebrón, Barcelona, Spain; [2]Hospital Ramón y Cajal, Madrid, Spain; [3]Pharmacoeconomics & Outcomes Research Iberia, Madrid, Spain; [4]Hospital Alto Deba, Mondragon, Spain; [5]Universidad de Castilla La Mancha, Toledo, Spain; [6]Boehringer-Ingelheim, Barcelona, Spain

CONOCES Study Investigators
Álvarez-Sabín J, Arenillas JF, Casado I, Castillo J, Escribano B, Gallego J, González C, Jiménez MC, Jiménez MD, Lago A, López JC, López JI, Martínez M, Masjuan J, Moniche F, Rebollo M, Segura T.

Introduction

- Stroke is the second cause of death in Spain, and the first one in women[1].
- Stroke episodes are more likely in population over 65 years old[2]. Demographical studies show that Spain will become one of the countries with the oldest population in 2050.
- According to previous estimations[3], in Spain stroke yields a cost of €6,722 per patient (year 2004) in the first year. Fifty-one percent of total cost is due to hospitalizations (€3,406 per patient)
- CONOCES is the biggest study carry out in Spain assessing stroke's costs and the first one designed to estimate societal costs.

Objective

The aim of the present study is to assess the hospital costs for the first clinically diagnosed stroke, to improve the knowledge on economic burden of stroke in Spain.

Methods

- CONOCES (*Costes Socioeconómicos del Ictus en España*) is an epidemiologic, observational, prospective study conducted in 16 Spanish centers (Figure 1) of the Spanish National Health System.
- Patients inclusion criteria were:
  - age ≥ 18 years old,
  - with the first clinically diagnosed stroke within less than 24-hour course,
  - admitted in hospital stroke units.
- Exclusion criteria:
  - diagnosis of transient ischemic attack (TIA),
  - previous stroke,
  - in-hospital strokes.
- Identification, selection and inclusion was prospective and consecutive, from Sunday to Thursday (0-24h).
- Recruitment period: 3-months (2 months + 1 rescue month).
- First visit will be performed at inpatient hospitalisation due to stroke.
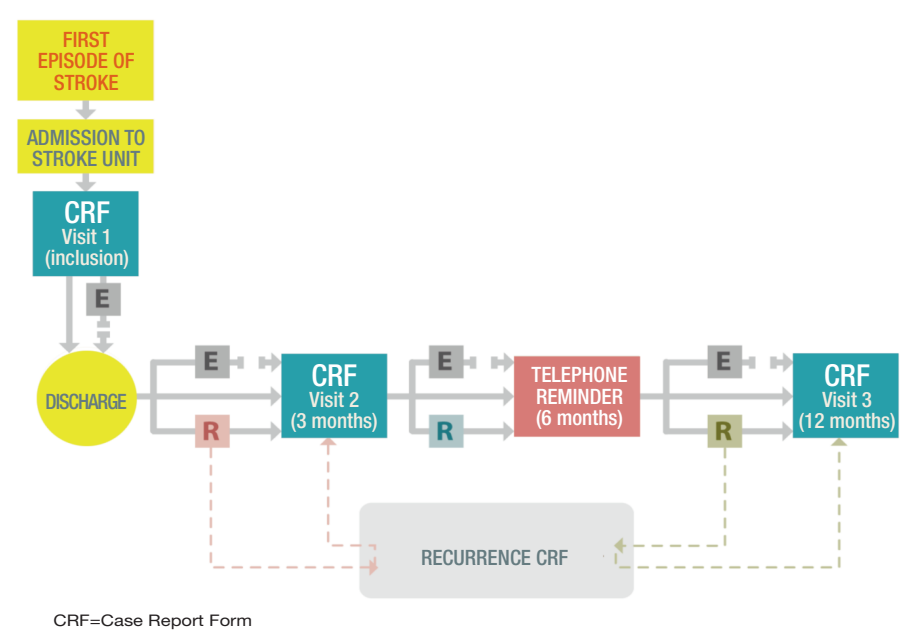- Follow-up visits for the study were scheduled as shown in Figure 2.

Figure 1. Participating centers in the CONOCES Study

Figure 2. Visits schedule

CRF=Case Report Form

- Preliminary analisys was performed with hospitalisation data from the first visit.
- Data collected from medical records and patient interviews included sociodemographic information, stroke severity, patient disability and QoL at discharge assessed with the following tools:
  - Barthel Index for the assessment of fisical dependency and loss of autonomy.
  - Modified Ranking Scale for the global assessment of physical disability.
  - National Institute of Health (NIH) Stroke Scale for the assessment of stroke injury severity.
- For direct cost estimation the following resource consumption were recorded:
  - Length of stay
  - Imaging and laboratory tests
  - Specific therapeutic interventions (thrombolysis, Decompressive craniectomy, angioplasty…)
  - Supporting therapies
  - Medication
- Unitary costs (€, year 2011 values)) were obtained from National Healthcare databases (eSalud, Diagnosis-Related-Groups and the Spanish Catalogue of Medicinal Products).

Results

- 321 patients were recruited from November 2010 to May 2011.
- Preliminary analysis of the information for these patients rendered the following characteristics:
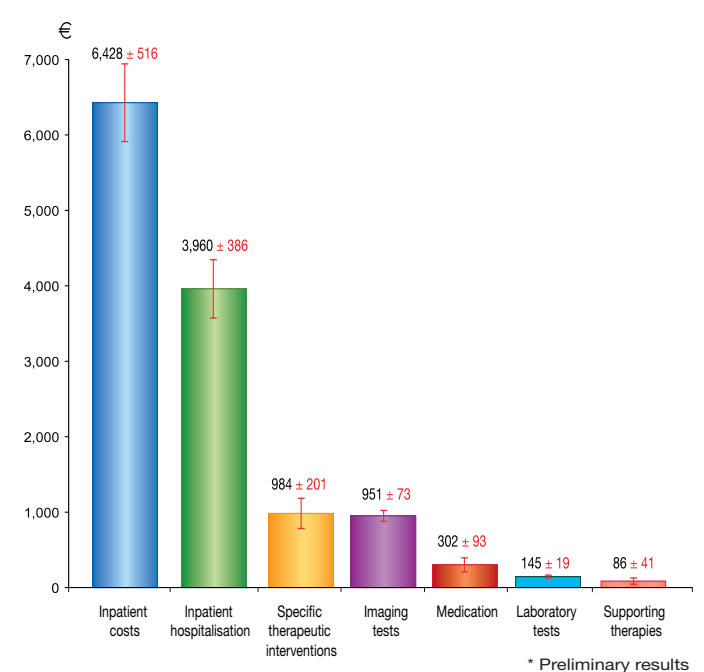
- The mean age of patients included in the study was 71.95 years, and 44.6% of patients were female.
- 28.6% of patients received intravenous thrombolysis.
- Patient mean scores in the NIH Stroke Scale, Modified Rankin Scale and Barthel Index were 5.40, 2.61 and 64.84, respectively.
- Mortality rate during hospital stay was 6.2%.
- Only 257 patients were eligible for economic purposes.
- Preliminary stroke cost results (Figure 3):
  - Mean length of hospital stay was 9.65 days (95%CI, 8.71-10.60)
  - Mean cost per patient and admission was €6,428.
  - The cost key drivers were:
    - Inpatient hospitalisation (€3,960; 61.6% of direct hospitalisation costs)
    - Specific therapeutic interventions (€984; 15.3%)
    - Imaging tests (€951; 14.8%)
    - Medication (€302; 4.7%)
    - Laboratory tests (€145; 2.3%)
    - Supporting therapies (€86; 1.3%)

Table 1. Patients characteristics*

DEMOGRAPHICS	
Gender (%)	
Male	55.4
Female	44.6
Age (Mean years ± SD)	71.95 ± 11.57
CLINICAL FEATURES	
Atrial Fibrilation (%)	50.3
Hemorrhage (%)	9.5
Brain Infarction (%)	90.5
Arterial hypertension (%)	60.6
Diabetes Mellitus (%)	19.9
Dyslipidemia (%)	30.7
Isquemic cardiopathy (%)	13.7
TIA in previous year (%)	1.2
NIH Stroke Scale at discharge (Mean + SD)	5.40 ± 7.00
Modified Rankin Scale at discharge (Mean + SD)	2.61 ± 1.75
Barthel Index at discharge (Mean + SD)	64.84 ± 36.46
Exitus (%)	6.2

* Preliminary results

Figure 3. Stroke costs results*

* Preliminary results

Conclusions

- **CONOCES preliminary results show that mean hospital cost for a stroke episode in Spain is €6,428 per patient.**
- **Hospitalisation cost and specific therapeutic interventions are the key drivers.**

References

1 Instituto Nacional de Estadística. Defunciones según causa de muerte. Año 2008. http://www.ine.es/jaxi/tabla.do?path=/t15/p417/prov/l0/&file=01001.px&type=pcaxis&L=0
2 Ministerio de Sanidad y Consumo. Estrategia en ictus del Sistema Nacional de Salud. Disponible en. http://www.msc.es/organizacion/sns/planCalidadSNS/docs/EstrategiaIctusSNS.pdf
3 Navarrete-Navarro P, Hart WM, López-Bastida J, Christensen MC. The societal costs of intracerebral Hemorrhage in Spain. European Journal of Neurology 2007; 14:556-562