

# COSTS IN PATIENTS ALONG FIRST YEAR POSTSTROKE IN SPAIN

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## INTRODUCTION

- Stroke is the 2<sup>nd</sup> cause of death in Spain, and the 3<sup>rd</sup> in women<sup>1</sup>. The one-year mortality approaches 30%<sup>2</sup>. In addition, stroke is a prominent cause of disability and represents a high burden for the health care system and society<sup>3</sup>.
- Atrial fibrillation (AF) 5-folds the risk of stroke. Moreover, strokes in AF patients are more severe, with higher mortality and recurrence rates, and worse disability levels<sup>4,5</sup>.
- Increased stroke severity in AF can represent an increase on resource use<sup>6</sup>.
- CONOCES is the first socioeconomic stroke costs study comparing patients with and without AF in Spain.

## OBJECTIVE

➔ The objective of the present study was to compare the first year post-stroke costs in patients with or without AF in Spanish stroke units using a societal perspective

## METHODS

- The CONOCES study "Socioeconomic Stroke Costs in Spain" is an observational, multicenter, naturalistic and prospective study on stroke socioeconomic costs.
- The study included 16 hospitals (stroke units of National Health System hospitals) from 16 different Spanish regions. Patients were recruited from November 2010 to May 2011.
- Patient inclusion criteria: older than 18, diagnostic of clinical ischemic or hemorrhagic stroke with less than 24 hours evolution. We included 50% of patients with AF and 50% with non-AF. Patient exclusion criteria was ischemic attack, stroke history, intrahospitalary stroke. They were recruited at first stroke hospitalization (1st visit), and monitoring was at 3 and 12 months post-stroke.
- The information was collected for patients and caregiver through direct physician interviews. We analyzed sociodemographic and clinical patient characteristics; and patient neurologic status, disability, dependency and QoL (NIH scale, Rankin scale, Barthel index and EQ-5D), and caregiver Zarit scale.
- The study took into account consumption of direct healthcare and non-healthcare costs, societal costs (formal and informal care) and indirect costs (productivity lost and early mortality costs) during the first year post-stroke. Unit costs (€ 2013) were obtained from different Spanish sources (official published data).

## RESULTS

A total of 321 post-stroke patients were recruited, 160 with AF and 161 without AF. Of these 291 had an ischemic stroke (IS) and 30 an intracranial hemorrhage (ICH) (table 1). The most predominant comorbidity was arterial hypertension (AHT). The time between stroke episode and neurology assistance was 4.96±4.85 hours. Stroke Code Activation took place in 52% of the patients. A total of 7.8% of patients had stroke recurrences with no differences between AF and non-AF. Patients exitus one year post-stroke was 13.0% non-AF vs 21.9% AF (statistically significant, p=0.026).

NIH value improved between hospital entry and exit and it showed differences statistically significant between non-AF and AF patients at hospital entry (p<0.001) and at hospital exit (p=0.005) (table 1). Barthel index and Rankin scale improved along the year (table 1). Barthel index showed statistically significant differences between non-AF and AF patients in all visits. Also, Rankin scale showed the same profile as Barthel index between non-AF and AF patients. The global patients status one year post-stroke was mild disability and dependence.

Table 1. Patients Clinical and Sociodemographic characteristics.

|  | non-AF<br>N=160 | AF<br>N=161 | Total patients<br>N=321 | p-value |
|--|-----------------|-------------|-------------------------|---------|
| Age (years±SD)                             | 67.78±14.54     | 76.46±9.97  | 72.12±13.19             | <0.001  |
| Male                                       | 60.9%           | 48.8%       | 54.8%                   | 0.03    |
| Ischemic stroke                            | 86.3%           | 95.0%       | 90.7%                   | 0.01    |
| Intracranial hemorrhage                    | 13.7%           | 5.0%        | 9.3%                    |         |
| Rankin scale hospital exit >2              | 41.0%           | 56.3%       | 48.6%                   | 0.004   |
| Rankin scale 2 <sup>nd</sup> visit >2      | 29.0%           | 41.8%       | 35.0%                   | 0.016   |
| Rankin scale 3 <sup>rd</sup> visit >2      | 22.5%           | 36.4%       | 28.9%                   | 0.01    |
| Barthel index hospital exit (mean)         | 71.18           | 59.17       | 65.33                   | 0.003   |
| Barthel index 2 <sup>nd</sup> visit (mean) | 81.74           | 71.93       | 77.08                   | 0.005   |
| Barthel index 3 <sup>rd</sup> visit (mean) | 84.27           | 76.21       | 80.56                   | 0.014   |
| NIH scale at hospital entry (mean±SD)      | 7.39±5.53       | 10.84±7.48  | 9.11±6.79               | <0.001  |
| NIH scale at hospital exit (mean±SD)       | 4.25±5.73       | 6.45±7.84   | 5.31±6.91               | 0.005   |
| Stroke risk factors (%)                    | 74.5%           | 81.9%       | 78.2%                   | —       |
| INR value in OAC patients (mean±SD)        | 1.75±0.21       | 1.86±1.17   | 1.85±1.12               | —       |
| Exitus during first year post-stroke       | 13.0%           | 21.9%       | 17.4%                   | 0.026   |
| Recurrences                                | 6.2%            | 9.4%        | 7.8%                    | 0.198   |

OAC: Oral anticoagulants. INR: International Normalized Ratio index of blood coagulability.

The overall cost per year and patient was 27,711€. Direct healthcare costs were 30.6% of total costs (table 2). Intrahospital costs were 68.7% and extrahospital costs were 31.2% of total direct healthcare costs. The mainly direct cost was hospital stay which represented 70.1% of total intrahospital costs. Mean of hospital stay was 10.47±7.79 days.

Table 2. Stroke total costs.

|                             | non-AF<br>N=155<br>mean | AF<br>N=151<br>mean | Total patients<br>N=306<br>mean | p-value |
|-----------------------------|-------------------------|---------------------|---------------------------------|---------|
| Direct healthcare costs     | 8,077 €                 | 8,915 €             | 8,491 €                         | 0.291   |
| Direct non-healthcare costs | 17,797 €                | 19,512 €            | 18,643 €                        | 0.560   |
| Indirect costs              | 691 €                   | 458 €               | 576 €                           | 0.264   |
| <b>TOTAL COSTS</b>          | <b>26,566 €</b>         | <b>28,886 €</b>     | <b>27,711 €</b>                 | 0.465   |

Direct non-healthcare costs were 67.3% of total costs, and informal care represented 89.5% of these costs (table 2-3). Only 5.4% of patients received formal care. The informal caregiver provided 46.42 hours per week in the 2<sup>nd</sup> visit and 42.19 hours per week in the 3<sup>rd</sup> one. There were no significant differences between non-AF and AF patients. Indirect costs were 2.1% of total costs (table 3).

AF costs were higher than non-AF but only formal care and support therapy costs were statistically significant (table 2). The most explicative variables for these results were age, male sex, NIH stroke scale, AHT comorbidity, and exitus along study.

Table 3. Stroke intrahospital and extrahospital costs.

|                                  | non-AF<br>N=155<br>mean | AF<br>N=151<br>mean | Total patients<br>N=306<br>mean | p-value |
|----------------------------------|-------------------------|---------------------|---------------------------------|---------|
| <b>INTRAHOSPITAL COSTS</b>       |                         |                     |                                 |         |
| Direct healthcare costs          | 5,642 €                 | 6,040 €             | 5,838 €                         | 0.387   |
| Direct non-healthcare costs      | 10 €                    | 14 €                | 12 €                            | 0.085   |
| <b>Total intrahospital costs</b> | <b>5,652 €</b>          | <b>6,054 €</b>      | <b>5,850 €</b>                  | 0.384   |
| <b>EXTRAHOSPITAL COSTS</b>       |                         |                     |                                 |         |
| Direct healthcare costs          | 2,436 €                 | 2,876 €             | 2,653 €                         | 0.438   |
| Direct non-healthcare costs      | 17,787 €                | 19,498 €            | 18,631 €                        | 0.561   |
| Indirect costs                   | 691 €                   | 458 €               | 576 €                           | 0.264   |
| <b>Total extrahospital costs</b> | <b>20,913 €</b>         | <b>22,832 €</b>     | <b>21,860 €</b>                 | 0.538   |

## CONCLUSIONS

- ➔ The management of stroke patients has improved in terms of mortality and recurrence.
- ➔ Stroke and its consequences represent an important use of healthcare and social resources during the first year post-stroke (hospital stay and informal care costs mainly).
- ➔ The costs are higher in AF patients than in non-AF patients, although global study population costs do not show statistically significance differences. However, formal care and support therapy costs show significant differences.
- ➔ Several studies from others countries showed similar healthcare costs but lower informal care costs, which were more than two-thirds of total costs in our study, with a very high burden over the family or informal caregiver.

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