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Original article

Regional disparities in acute and post-acute care of stroke patients in France, 2015

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ABSTRACT

Objective. – The aim of this study was to assess regional variations of the hospital management of stroke patients during acute and post-acute phases in France in 2015.

Material and methods. – Hospitalized patients coded with stroke as their main diagnosis or, if hospitalized in several different wards, any main ward diagnosis were identified in the 2015 French national hospital discharge database for acute care. Rates of hospitalization in stroke units (SUs) were assessed at a national level and in all metropolitan and overseas regions. All stroke survivors discharged at the end of the acute phase were subsequently identified in the national database for post-acute rehabilitation hospitalization (PARH) within 3 months.

Results. – In the acute phase, half the stroke patients hospitalized for intracerebral hemorrhage, cerebral infarction or unspecified stroke were admitted to SUs. However, there were variations across metropolitan regions (from 30% to 69%) and in overseas regions (from 1% to 59%); these rates correlated with regional ratios of SU beds/100,000 inhabitants. There were also regional differences in PARH rates—in hemiplegic stroke patients, 62% were admitted for PARH (range: 58% to 67%) in metropolitan regions and, overseas, from 8% to 67%—as well as geographical discrepancies in PARH rates to specialized rehabilitation units. Hospitalization rates of hemiplegic stroke patients in neurological rehabilitation centers were 30% for the whole country, but ranged from 23% to 36% in metropolitan regions and from 2% to 45% in overseas regions.

Conclusion. – This study focused on hospital-based management of stroke patients. In spite of the creation of new SUs over the past decade in France, there are persistent regional differences in the number of SU beds/100,000 inhabitants and, consequently, in the rate of stroke patients managed in SUs. However, rates continue to improve with the creation of new SUs and the expansion of existing ones. Regional variations were also noted for post-acute hospitalization rates and PARH beds/places.

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1. Introduction

Stroke is a frequent health event and a major cause of death and disability worldwide [1]. In France, stroke mortality rates have decreased over the past four decades, as has also been the case in most developed countries. However, with 31,000 deaths due to stroke recorded in 2013 [2], stroke remains the leading cause of death in women and the third cause in men. Although age-standardized global rates show relative stability, the absolute number of patients hospitalized for stroke (as the main diagnosis) rose in the past decade from 90,600 in 2005 [3] to 110,400 in 2014 [4] because of both the growing and aging of the French population.

Stroke prevention and stroke patient management represent public-health priorities to minimize stroke burden. In the acute phase, it has been shown that the outcomes of stroke patients managed in dedicated stroke units (SUs) are better than in general or neurological wards, with fewer deaths and less dependency [5]. In the post-acute phase, the management of stroke patients should first be adapted according to neurological deficits [6].

A national comprehensive stroke plan was implemented in France from 2010 to 2014, and aimed to improve stroke prevention as well as the management of stroke patients from the onset of stroke symptoms to their return home [7]. Thanks to this plan, there was a mobilization of health authorities, professionals and patients, with noticeable improvements over the past few years and better coordination of the participating groups. For acute-phase care, the number of SUs throughout the country was increased from 77 in 2009 to 135 in 2015, according to annual statistics of hospitals database (*Statistique Annuelle des Etablissements de santé*; SAE). As for the post-acute phase, a number of goals were accomplished, such as recommendations to improve rehabilitation pathways, multiprofessional evaluation consultations, creation of mobile rehabilitation units, and home support and therapeutic educational programs.

Previous studies showed that the proportion of stroke patients admitted to SUs increased in France from 26% in 2009 [8] to 37% in 2012 [9] and 43% in 2014 [4]. During that time, the percentage of stroke survivors admitted to post-acute hospitals also increased, from 34% in 2009 to 36% in 2014 [10].

Nevertheless, there are persistent disparities among French regions in SU availability and rehabilitation beds. Thus, the present study aims to characterize regional disparities in the hospital management of stroke patients during acute and post-acute phases in 2015, after the end of the 2010–2014 nationwide comprehensive stroke plan.

2. Methods

2.1. Acute-phase hospitalizations

The following data were extracted from the French national hospital-discharge database for acute care (Program of Medicalization of Information Systems in Medicine, Surgery,

Obstetrics and odontology; PMSI-MCO 2015): adult patients aged ≥ 18 with stroke codes (ICD-10 categories I60–I64) as the main diagnosis or the main ward diagnosis (in cases of stays in several wards). For patients with several hospitalizations (for instance, in cases of transfer), acute-care episodes were identified to account for information on contiguous stays, with each episode comprising all hospitalizations with lag < 3 days. Only one episode per patient was considered for the study (the first episode of that year).

Only patients residing in French regions (including metropolitan and overseas regions) were included. Excluded were stroke survivors discharged after only one brief hospital stay (0 or 1 day), as they are atypical patients with low SU hospitalization rates and few cases of hemiplegia.

2.2. Post-acute hospitalizations

Stroke survivors discharged during the first three quarters (9 months) of 2015 were subsequently identified in the national hospital-discharge database of follow-up or rehabilitation care (PMSI-SSR) for post-acute rehabilitation hospitalization (PARH) within a maximum of 90 days from the end of the acute-care episode to the beginning of post-acute care. Specialization (neurological, geriatric, other specialty or general) of the PARH service and mean number of rehabilitation activities (first week only) were assessed. Total duration of stay was calculated, taking into account contiguous stays with interruptions of up to 5 days, which happen frequently during the rehabilitation process (because of weekends, therapeutic leaves or changes from inpatient to outpatient status). In addition, stroke survivors discharged with no PARH within 3 months were also identified in the home hospitalization database (PMSI-HAD) for the same time period in 2015.

2.3. Availability of hospital beds/places and telemedicine

Information on SU beds, telemedicine and post-acute beds or places per facility was extracted from the 2015 annual statistics of health facilities (SAE 2015), a database describing the various resources offered by private and public hospitals.

2.4. Statistical analyses

Hospitalization pathways were analyzed for all patients and several subgroups too. In the acute phase, regional disparities of SU management were found for all strokes and also cerebral infarction (CI), intracerebral hemorrhage (ICH) and unspecified stroke (USS), with thrombolysis rates only for CI. PARH was considered for all stroke survivors and those with hemiplegia or tetraplegia. Regional differences were calculated as crude rates and also, to take account of the age of the regional structures, as comparative index [indirect standardization of rates or standardized mortality ratio (SMR)], making statistical comparisons with national standardized values (SMR = 100) possible. Ratios of SU beds and post-acute rehabilitation beds (for inpatients) or places (for outpatients) per 100,000 inhabitants were also calculated at national and regional levels.

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