Original article

Care pathways and healthcare use of stroke survivors six months after admission to an acute-care hospital in France in 2012

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INFO ARTICLE

ABSTRACT

Introduction. – Care pathways and healthcare management are not well described for patients hospitalized for stroke.

Methods. – Among the 51 million beneficiaries of the French national health insurance general scheme (77% of the French population), patients hospitalized for a first stroke in 2012 and still alive six months after discharge were included using data from the national health insurance information system (Sniiram). Patient characteristics were described by discharge destination–home or rehabilitation center (for < 3 months)–and were followed during their first three months back home.

Results. – A total of 61,055 patients had a first admission to a public or private hospital for stroke (mean age; 72 years, 52% female), 13% died during their stay and 37% were admitted to a stroke management unit. Overall, 40,981 patients were still alive at six months: 33% of them were admitted to a rehabilitation center (mean age: 73 years) and 54% were discharged directly to their home (mean age 67 years). For each group, 45 and 62% had been previously admitted to a stroke unit. Patients discharged to rehabilitation centers had more often comorbidities, 39% were highly physically dependent and 44% were managed in specialized neurology centers. For patients with a cerebral infarction who were directly discharged to their home 76% received at least one antihypertensive drug, 96% an antithrombotic drug and 76% a lipid-lowering drug during the following month. For those with a cerebral hemorrhage, these frequencies were respectively 46, 33 and 28%. For those admitted to a rehabilitation center, more than half had at least one visit with a physiotherapist or a nurse, 15% a speech therapist, 10% a neurologist or a cardiologist and 15% a psychiatrist during the following three months back home (average numbers of visits for those with at least one visit: 23 for physiotherapists and 100 for nurses). Patients who returned directly back home had fewer physiotherapist (30%) or nurse (47%) visits but more medical consultations. The 3-month re-hospitalization rate for patients who were discharged directly to their home was 23% for those who had been admitted to a stroke unit and 25% for the others. In rehabilitation centers, this rate was 10% for patients who stayed < 3 months.

Conclusions. – These results illustrate the value of administrative databases to study stroke management, care pathways and ambulatory care. These data should be used to improve care pathways, organization, discharge planning and treatments.

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1. Introduction

Stroke epidemiology varies across countries. Reduced incidence and mortality has been reported from certain industrialized countries [1–4]. This is to be related to several factors, including preventive measures such as better general hygiene and use of medications (antihypertensive, antithrombotic, antidiabetic, lipid-lowering drugs), but also to earlier and higher quality care. In France, a national survey (*Handicap Santé*) of persons living at home or in institutions in 2008–9 reported that the stroke prevalence was 1.6% of the adult population [5]. The prevalence increased with age: 2.9% in the 60–74 year age group, 6.1% in the 75–84 year age group and 9.5% beyond the age of 84 years. More than half of the stroke victims (55%) reported a serious limitation of their daily activities, compared with 10% of the other respondents. Healthcare expenditures for stroke care reimbursed to beneficiaries of the national health insurance were an estimated 3.8 billion Euros in 2012, i.e. 2.6% of total expenditures. Regarding persons hospitalized for stroke in 2012, expenditures were 1.6 billion Euros, and 2.2 billion for those who had a stroke [6].

A stroke plan of action (2010–14) elaborated and implemented by the French Ministry of Health included the following elements: development of care pathways giving priority to stroke victims in the regional health project; organization of medical-social care; definition of a post-stroke "work-up" for consultations [7]. In addition, the Superior health authority published several guidelines on the different phases of stroke care. There are however few data, from France or other countries, concerning real-life management practices and healthcare use after a hospital stay for stroke.

The purpose of this study was to provide information on persons hospitalized in France for a first stroke in 2012 using data obtained from the national health insurance information system (*Système national d'information inter-régimes de l'assurance maladie* [Sniiram]). Data collected concerned the hospital stay and the six-month period after discharge to home or a rehabilitation center.

2. Methods

2.1. Data sources and population

In France, data concerning beneficiaries of the different national health insurance schemes are collected by an information system called Sniiram [8]. This anonymous database provides exhaustive individualized data on all prescriptions, explorations, and reimbursements executed during the three preceding years and the current year. Medications are identified using the Anatomic Therapeutic Chemical (ATC) pharmaceutical coding system. Medical acts, whether performed in an outpatient or inpatient setting, are identified using a common classification system of medical acts (*Classification commune des actes médicaux* [CCAM]). The Sniiram database does not contain any information on outcome. It does however include information on the existence of some chronic diseases and the beneficiary's reimbursement status. Patients are entitled to 100% reimbursement of healthcare expenditures if such expenditures concern a chronic disease included on the list of diseases of long duration (*Affection de longue durée* [ALD]) for which the diagnosis proposed by their general practitioner has been approved by the healthcare fund's advisory physician. Stroke and its sequelae, in particular hemiplegia, are defined as ALDs. All of this information is linked with data on hospital stays in acute-care institutions and rehabilitation centers provided by hospital discharge database (acute hospital and rehabilitation center) (*Programme de médicalisation des systèmes d'information* [PMSI]). The ALDs and hospital diagnoses are coded according to the 10th revision of the International Statistical Classification of Diseases and Related Health problems (ICD-10).

The present study involved all beneficiaries of the French national health insurance general scheme, i.e. 77% of 64 million inhabitants whose vital status is constantly updated. The study population included persons aged 18 years or older who were admitted in 2012 to an acute-care institution for stroke (primary diagnosis during hospital stay, ICD-10 codes I60–I64). Persons admitted then discharged without one night in hospital were excluded from the analysis. Only one hospital stay, the first of the year, was retained for analysis. In order to limit the study to persons with a first hospital stay for stroke in 2012, persons who were admitted to hospital for stroke or a transient ischemic attack (TIA) from 2005 through 2011 and persons designated as presenting an ALD (stroke or hemiplegia) before 2012 were excluded from the analysis. The high quality metrology of the PMSI for stroke coding has been reported elsewhere [9].

2.2. Definitions and data analysis

In 2012, universal complementary health insurance coverage (*Couverture maladie universelle complémentaire* [CMUC]) was attributed to 4.5 million persons with an annual income below 7771 Euros (single person), allowing them free access to healthcare. For the purpose of this study, only persons aged less than 60 years were considered for analysis because other social assistance allowances with a higher cutoff level are attributed to older persons.

Information on patients' comorbid conditions in 2011 were obtained from Sniiram data via pathology maps produced by the national healthcare insurance scheme. Such maps are designed to identify pathology and health status clusters