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## Original article

# First hospitalization for transient ischemic attack in France: Characteristics, treatments and 3-year outcomes



## Prise en charge et suivi à 3 ans des personnes avec une première hospitalisation pour un accident ischémique transitoire (AIT) en France en 2010

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### ABSTRACT

**Introduction.** – Characteristics of patients hospitalized for transient ischemic attack (TIA) management before and during this hospitalization and follow-up are not well documented on very large populations.

**Methods.** – Among the 51 million beneficiaries of the French national health insurance general scheme (77% of French population), those subjects hospitalized for a first TIA in 2010 were included using the national health insurance information system (SNIIRAM). The frequencies of comorbidities during the previous five years and drug treatments received during the previous year and the first month after discharge were estimated from the SNIIRAM and then compared to data derived from the permanent randomized sample of all health insurance beneficiaries based on standardized morbidity ratios (SMR). The three-year outcome and factors associated with at least one readmission for TIA or ischemic stroke during the three months following the first hospitalization were investigated.

**Results.** – A total of 18,181 patients were included (mean age: 69 years, 55% of women). The crude incidence of hospitalized TIA was 0.36 per 1000. Before hospitalization, patients presented a significantly higher rate of carotid and cerebral atherosclerosis (2.4% SMR = 1.4), atrial fibrillation (9.1%, SMR = 1.3), ischemic heart disease (13.7%, SMR = 1.3), valvular heart disease (9.7%, SMR = 1.5), and treatment with platelet aggregation inhibitors (29%, SMR = 1.4), antihypertensives (60%, SMR = 1.2) and antidiabetics (16%, SMR = 1.5). These SMR decreased with age. One month after discharge from hospital, 82% of patients still alive filled at least one prescription for antithrombotic therapy (platelet aggregation inhibitor: 74%, vitamin K antagonist: 12%), one class of antihypertensive in 57% of patients,

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an antiarrhythmic in 9% of patients, an antidiabetic treatment in 14% of patients and a lipid-lowering agent in 53%. During the month following discharge from hospital, 3.2% of patients were readmitted at least once for TIA, 1.9% were readmitted for ischemic stroke and 1.5% of patients died. These figures were 3.9%, 2.4% and 2.9% at three months, and 7.2%, 5% and 16.3% at three years, respectively. On multivariate analysis, factors associated with readmission for TIA or ischemic stroke were age  $\geq 65$  years and antidiabetic treatment before hospitalization. In contrast, male gender, admission to a stroke unit and length of stay were associated with a lower readmission rate.

**Conclusions.** – These results illustrate the value of administrative databases to study TIA. Hospitalizations for TIA were relatively frequent and the recurrence rate was similar to that reported in similar recent studies. Level of primary and secondary prevention must be improved.

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## R É S U M É

**Introduction.** – Les caractéristiques et devenir des personnes hospitalisées pour un accident ischémique transitoire (AIT) sont peu documentées sur de larges populations.

**Méthode.** – Parmi les 51 millions d'assurés du régime général de l'assurance maladie, ceux hospitalisés pour un premier AIT en 2010 ont été inclus. Les fréquences des comorbidités ont été estimées à l'aide du système d'information national de l'assurance maladie (SNIIRAM) puis comparées à celles d'un échantillon permanent des assurés (EGB), par des *standardized morbidity ratios* (SMR).

**Résultats.** – Ont été incluses, 18 181 personnes (âge moyen : 69 ans, femmes : 55 %). L'incidence brute des AIT hospitalisés était de 0,36 ‰. Étaient significativement plus fréquentes : athérosclérose cervicale et cérébrale (2,4 %, SMR = 1,4), fibrillation auriculaire (9,1 %, SMR = 1,3), cardiopathie ischémique (13,7 %, SMR = 1,3), valvulopathie (9,7 %, SMR = 1,5), et un traitement par antiagrégant plaquettaire (29 %, SMR = 1,4), antivitamine K (8 %, SMR = 1,2), antihypertenseur (60 %, SMR = 1,2), antiarythmique (8 %, SMR = 1,4) et antidiabétique (16 %, SMR = 1,5). Un mois après leur sortie, 82 % des patients avaient au moins une délivrance d'un traitement antithrombotique, 3,2 % ont été réhospitalisés pour AIT, 1,9 % pour infarctus cérébral ; à 3 mois : 3,9–2,4 % ; à 3 ans : 7,2–5 %.

**Conclusion.** – Les hospitalisations pour AIT sont relativement fréquentes et le taux de récurrence est proche de celui d'études similaires récentes.

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## 1. Introduction

The epidemiology of stroke varies from one country to another and some studies have reported a declining incidence and mortality, which can be attributed, among other factors, to improved prevention and improved treatment of risk factors with the use of antihypertensive drugs, antithrombotics and lipid-lowering agents, but also lifestyle modifications [1,2]. In France, the standardized all-age hospitalization rate for cerebrovascular accident, or more specifically transient ischemic attack (TIA), decreased between 2002 and 2008. However, the incidence of TIA and stroke in subjects under the age of 55 years is increasing as in other countries [3,4].

The risk of ischemic stroke during the three months following a TIA is generally considered to be about 10% and essentially occurs during the first few days after the TIA [5]. For primary care clinicians, it is important to evaluate this risk and the need for hospitalization, which is based on recent onset (less than 72 hours) and the calculation of various scores [6].

International guidelines recommend hospitalization in the case of recent TIA, brain MRI, cardiovascular investigations and, most importantly, antihypertensive and antithrombotic therapy adapted to the origin of the TIA [7,8].

This national study was designed to compare the characteristics of patients hospitalized for a first TIA to those of control subjects, describe their management before and during this hospitalization, the three-year outcome and to identify factors associated with at least one readmission for TIA or ischemic stroke during the three months following the first hospitalization.

## 2. Methods

### 2.1. Data source and population

In France, data concerning the beneficiaries of the various national health insurance schemes are collected in the French National Health Insurance information system (SNIIRAM) [9].

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