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Vital and functional outcomes of the first-ever hemispheric stroke, epidemiological comparative study between Kunming (China) and Limoges (France)

Devenir vital et fonctionnel après un premier AVC hémisphérique : épidémiologie comparative entre Kunming (Chine) et Limoges (France)

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Abstract

Background. – Clinical outcomes and socioeconomic consequences after a stroke may differ between regions.
Methods. – One cohort was established prospectively in Kunming (China) to compare with a cohort of 156 stroke patients included in Limoges (France). During 1 year, patients hospitalized within 48 hours for a first-ever hemispheric stroke were included. Demographic data and neurocardiovascular risk factors were registered. Hemiplegia was evaluated. Functional outcome was assessed using the Barthel Index (BI) after 3 months.
Results. – One hundred and eighteen patients were included in Kunming. Patients of Kunming were younger (61.4 ± 13.4 vs 72.3 ± 14.6 years in Limoges, $P < 0.0001$), more involved in professional activity (36.4% vs 12.8%, $P < 0.0001$). Survival analysis indicated that mortality did not differ between cohorts, but independently predicted by coma at the 2nd day (HR = 9.33, 95% CI [4.39, 19.78]) and age > 70 years (HR = 6.29, 95% CI [2.36, 16.59]). Despite a better baseline BI for patients of Kunming (50.0 ± 34.9 vs 37.4 ± 34.2, $P = 0.0031$), after adjustment for confusing, patients in Limoges had a 2.11 OR 95% CI [1.03, 4.31]) to reach a BI > 80 at 3 months.
Conclusions. – Functional recovery for patients of Kunming was not as good as expected. The socioeconomic consequences of stroke in Kunming are significant as they involved younger subjects who were still in work.

Keywords: Cerebrovascular accident; Outcome; Epidemiologic studies; Mortality; Disability; Rehabilitation

Résumé

Les conséquences fonctionnelles et socioéconomiques après accident vasculaire cérébral (AVC) peuvent variées d'un pays à l'autre.
Méthode. – Nous avons comparé une cohorte d'AVC constituée prospectivement à Kunming (Chine) à une cohorte de 156 patients AVC suivie à Limoges (France). Durant un an, les patients hospitalisés dans les 48 heures suivant un AVC hémisphérique ont été inclus. Les données démographiques et les facteurs de risque neuro-cardiovasculaires ont été notés. Les hémiplégies ont été évaluées avec des échelles validées. Le devenir fonctionnel était évalué avec l'index de Barthel à trois mois.
Résultats. – Cent dix-huit patients ont été inclus à Kunming. Les patients de Kunming étaient plus jeunes (61,4 ± 13,4 vs 72,3 ± 14,6, $p < 0,0001$), plus souvent en activité professionnelle (36,4 % vs 12,8 %, $p < 0,0001$). L'analyse de survie montrait que la mortalité ne différait pas entre les deux cohortes et était liée de façon indépendante à l'existence d'un coma au second jour (HR = 9,33, 95 % IC [4,39, 19,78]) et à un âge

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supérieur à 70 ans (HR = 6,29, 95 % IC [2,36, 16,59]). Malgré un score de Barthel initial plus bas (50 ± 34,9 vs 37,4 ± 34,2, $p = 0{,}0031$), après ajustement, les patients de Limoges avaient une meilleure récupération fonctionnelle à trois mois (OR 2,11, 95 % IC [1,03, 4,31]).
Conclusion. – La récupération fonctionnelle pour les patients de Kunming n'était pas aussi bonne qu'espérée par le pronostic initial. Les conséquences socioéconomiques des AVC à Kunming sont plus importantes car concernent des sujets plus jeunes, en activité professionnelle.

Mots clés : Accident vasculaire cérébral ; Devenir ; Épidémiologie ; Mortalité ; Morbidité ; Rééducation

1. English version

1.1. Introduction

Stroke is a major public health problem throughout the world, associated with a high mortality, disability rate and financial costs. At the present time, stroke is the second leading cause of death, representing 10% of all deaths worldwide [21], and half of the survivors suffer sequelae of various extents [28], which causes a high indirect socioeconomic burden after stroke [16].

The profiles and trends of stroke vary between countries [12]. Of 5.7 million deaths of stroke in 2005, 87% were in low- and middle-income countries [30]. Socioeconomic changes have led to the emergence of neurocardiovascular disease, especially in countries in transitional disease pattern [24]. China is in regions of the highest incidence rate [27] which attained around 210 per 100 000 per year [19,7], and mortality rate of stroke persisted in increasing, doubled from 1985 to 2005 [20]. Some studies point out that age of first-ever stroke becomes younger [13]. By contrast, benign trends have been observed in industrialized countries [32]: retard in age of first-ever stroke, reduction in incidence of disabling or fatal stroke, and reduction in the proportion of modifiable risk factors [3,29]. In France, incidence rate of stroke attains 145 per 100,000 per year, the French Dijon register study showed a stable incidence in spite of growth of population in risk, as well as the retard of age at first-ever stroke onset: 5 years in men and 8 years in women [4].

The goals of the management of acute stroke are to reduce the case fatality and dependent rate by 3 months after stroke onset [17]. Studies of stroke prognostic can offer the predictors, which could serve as the targets of management. The present study aimed to compare the vital and functional outcomes by 3 months of first-ever hemispheric stroke, with consideration of epidemiological features, from a Chinese cohort established during the year from 2006 to 2007 with that of a French cohort constructed previously during 2002–2003.

1.2. Methods

1.2.1. Study design

This is an observational analytic longitudinal cohort study. Our study population consisted of patients of first-ever hemispheric stroke. The Chinese cohort was prospectively established from patients hospitalized in the Second Affiliated Hospital of Kunming Medical College of China (KM) during 2006–2007. The French cohort consisted of 156 first-ever stroke patients who were recruited prospectively in University Hospital of Limoges in France (LM). Same methodology was used in the establishment of these two cohorts. Patients were recruited over the course of 1 year with a follow-up period of 3 months. The study was approved by each local ethics committee and written consent was obtained from either the patient or their next of kin.

1.2.2. Sites of study and infrastructures

Kunming is a city of five million inhabitants, located in southwest of China. The Second Affiliated Hospital of Kunming Medical College is one of the main reference hospitals in this city, and covers essentially the Xishan District in which lives 448,000 inhabitants (census 2006). Limoges is a city in west central France. The University Hospital of Limoges covers the entire Limousine region, which has 725,000 inhabitants (census 2006). Both of the two cities are the capitals of their respective provinces, and are medium-sized cities in their respective countries.

For both of the two hospitals, the access to 24/24 hours cerebral computed tomography (CT) and magnetic resonance imaging (MRI) was available and none of them disposed a neurovascular unit during study period. In both sites, according the stroke etiology, medication treatment consisted of antiplatelet or anticoagulant drugs in ischemic stroke patients, and hypertonic agent for lowering intracranial pressure in hemorrhagic stroke patients. In LM, within the department of neurology, physiotherapy is provided from the second day after the stroke, when necessary, patients can then be transferred to a more suitable physical medicine and rehabilitation (PMR) department. While in KM, the access to the rehabilitation was limited by the finances of patients and the insurance coverage during the study period.

1.2.3. Inclusion criteria

All patients victim of a first hemispheric stroke with symptoms lasting at least 24 hours were included. We excluded patients with recurrent stroke and patients hospitalized after 48 hours of the onset of stroke symptoms. Patients with subarachnoid hemorrhage or subtentorial stroke were also excluded as well as patients who recovered completely within 24 hours without recent lesion on MRI.

1.2.4. Variable collections

The variables collected in this study consisted of socio-demographic information, risk factors and medical assessments. The socioeconomic information included age, sex, living situation, profession and employment status before stroke onset.