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Research Article

EPIDEMIOLOGICAL AND EVOLUTIONARY ASPECTS OF EPILEPSY IN THE ELDERLY IN SUB-SAHARAN AFRICA CASE OF SENEGAL

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Abstract

Introduction: Epilepsy in the elderly is the existence of at least 2 unprovoked epileptic seizures occurring within at least 24 hours in people over 65 years of age. It is 5 times more common in people over 75 years old than in young adults (24 to 35 years old) and represents the third neurological disease in the elderly after Alzheimer's disease and stroke. So, epilepsy is common in the elderly. It has epidemiological, electro clinical and etiological peculiarities compared to the forms of the child. Few studies have been carried out on the subject; hence we are conducting this study whose objective is to determine the prevalence of epilepsy of the subject and to give its evolutionary aspects under treatment. **Patients and methods:** We conducted a retro and prospective descriptive study in a 12-month period from December 1, 2019 to November 30, 2020. This study concerned patients aged 60 and over hospitalized for epileptic seizures or having presented a seizure during hospitalization. **Results:** Thirty nine epileptic patients aged 60 years and older were collected across 674 inpatients during the study period. The hospital prevalence was around 5.78%. Focal crises dominated the picture but it is important to emphasize the high frequency of generalized crises. The status epilepticus was common. The majority of patients responded better to the monotherapy prescribed, which was often carbamazepine and Phenobarbital. Mortality was around 20% and was not statistically related to the status epilepticus. **Conclusion:** Epilepsy is common in the elderly. Its hospital prevalence was about 5.78% of all hospitalized patients. Especially ischemic stroke was the most common cause whose manifestations were dominated by focal tonic-clonic attacks. The clinical evolution under anti epileptic treatment represented by carbamazepine and Phenobarbital was favorable in more than 79% of cases with a mortality not necessarily related to epilepsy of the order of 20.51%.

Keywords: Epilepsy, Elderly, Evolutionary, CHU Fann.

INTRODUCTION

The epilepsy of the elderly is defined as the occurrence of at least two unprovoked epileptic seizures within at least 24 hours in people over the age of 65 (Jallon and Assal, 2003; Sen *et al.,* 2020). It is five times more common in those over 75 years of age than in young adults (24 to 35 years of age) and represents the 3rd neurological condition of the elderly after Alzheimer's disease and stroke (De Toffol, 2004). In developing countries, incidence is low and prevalence is higher than in children (Maiga *et al.,* 2013). There are several clinical, etiological and therapeutic characteristics that distinguish epilepsy in older patients from that of young adults: prevalence of focal seizures, frequency of vascular causes and usually poor tolerance of antiepileptics (De Toffol, 2004). The circumstances leading to the diagnosis are frequent and non-specific: abnormal movements during waking or sleeping, falls (Bladin *et al.,* 2000; So N, Andermann, 1997), unusual motor and psychic manifestations, disturbance of consciousness (Vespignani *et al.,* 2002; Dupont *et al.,* 2009; Mahmoudi Rachid *et al.,* 2009). The following semiotic elements are usual in the elderly compared to young adults: the prolonged duration of post-critical confusion (several hours), the lower frequency of urine loss and the rarity of tongue bites in toothless subjects (Sirven, 1998; Van Cott Anne, 2002). Breakdowns of contact, characteristic of complex focal crises, and brief post-critical confounding states are readily overlooked by a lack of awareness of the possibility of a diagnosis of complex focal crisis in the elderly (Stefan, 2011). In view of the high incidence of elderly epileptics and the scarcity of African studies on epilepsy in the elderly, we considered it appropriate to carry out this study, the aim of which is to describe the epidemiological aspects, electro clinical and evolutionary epilepsy in this population.

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MATERIALS AND METHODS

Framework for the study

Our study took place at the Ibrahima Pierre NDIAYE neurological clinic of Fann University Hospital in Dakar (Senegal). It is a referral centre and the only service with a good capacity for hospitalization of neurological pathologies with a sub-regional vocation (Mauritania, Guinea).

Type and period of study

This is a retro and prospective, descriptive and analytical study that took place during the period from December 1, 2019 to November 30, 2020, a period of 12 months.

Study population

Inclusion criteria: This study was conducted in subjects 60 years of age and older, hospitalized with an epileptic seizure or who had had at least one seizure while in hospital during the study period.

Criteria for Non-Inclusion: Patients over 60 years of age and more known since childhood have not been included in our study.

Study variables: Our study variables were age, sex, seizure and non-convulsive epileptic manifestations, EEG, biological, therapeutic and evolutionary aspects.

Methods

We conducted a systematic selection of patients who met the selection criteria. The data was recorded on a sheet before being saved on Excel software.

Results Analysis Plan

We used SPSS version 22 for statistical analysis. The confidence interval was calculated at 95% and the significance threshold for 0.05. Pearson correlation tests, Khi-2 and Anova tests were used for correlation and comparison of data.

Ethical considerations

We obtained informed consent from patients and rights-holders to interview and examine them. Anonymity was observed.

RESULTS

Hospital prevalence of epilepsy in the elderly

During the study period, 674 patients were hospitalized. Among them, 39 subjects aged 60 and over were epileptic, a hospital prevalence of 5.78%.

Demographic Characteristics

Our patients averaged 72.3 8.79 years of age with extremes ranging from 60 to 95 years and were predominantly female with a sex ratio of 1.05.

Clinical Data

Background: The most common history was HTA (74.4%) followed by stroke (35.9%), all ischemic (cf. Figure 1).

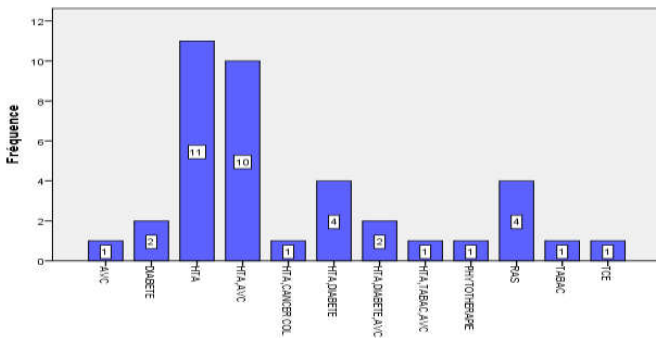

Figure 1. Distribution by patient history

Semiology of Crises: The semiology of epileptic seizures was marked by the predominance of focal seizures (51.3%), of which 3 were secondarily generalized; followed by generalized tonic-clonic seizures (43.6%). Initial seizures (occurring at the same time as motor deficit) were observed in 20 patients (51.3%); early seizures (within 7 days of deficit) in 3 patients (7.7%) and late seizures (after 7 days) in 4 patients (10.3%).

Non-convulsive manifestations were observed in types of mental confusion with psychomotor agitation and incoherent speech in five patients (12.8%); brief loss of consciousness in a patient (2.6%) and absence (break of contact) associated with automations in a patient (2.6%). Tongue bite was observed in five patients (12.8%). Three patients (7.7%) had urine loss and one patient had a tongue bite associated with urine loss (2.6%). The condition of epileptic malady was found in 16 patients or 41% including 8 cases of generalized malady either immediately or secondary to a focal crisis.

Physical Examination

Motor deficit was observed in 28 patients or 71.8%. This deficit was mostly recent, in 69.2% of patients. Language disorders with Broca aphasia type were present in 8 patients or 20.5%, and disorders of consciousness in 21 patients or 53.8%.

Paraclinical Data

EEG: The EEG was performed in 12 patients (30.8%) including 11 patients with standby EEG. It was pathological in 8 patients (66.7%). Among the abnormalities were an overall slowdown in the background rhythm in 3 patients (25%), a left hemispheric slowdown in one patient (8.3%) and an impoverishment of physiological figures on the right in one patient (8.3%). Irritative signs (spikes, slow wave point) were found in 6 patients (50%). These abnormalities were right temporo-parietal in 2 patients, right temporal in one patient, left suprasylvian in one patient, predominant in right posterior regions in one patient and bi-fronto-temporal in one patient.

Biology: The biological abnormalities found were: dyslipidemia in 4 patients, hyperglycemia in 3 patients, hyponatremia and leukocytosis predominantly granulocytic in 3 patients and hypokalaemia in 1 patient respectively.

Etiologies of epilepsy

The epilepsy of the elderly was primarily due to stroke (vascular epilepsy) in 30 patients (76.9%). This stroke was predominantly ischemic in 92%, hemorrhagic stroke affected only 2 patients (8%). Other etiologies were rare. These were two cases of lateral sinus CTVs (5.1%), and one case of chronic frontal parietal subdural hematoma (2.6%), brain abscess (2.6%), paraneoplastic encephalitis (2.6%), toxic encephalopathy (2.6%), metabolic encephalopathy (2.6%), and metabolic encephalopathy (2.6%), respectively and inflammatory encephalitis (2.6%). (Fig2)

Management: Antiepileptic Drugs (MAE)

They were the main therapeutic modality. Carbamazepine was the most widely used anti-epileptic drug (24 patients, 61.5%) followed by Phenobarbital (14 patients, 35.9%). Lamotrigine was used in one patient (2.6%).

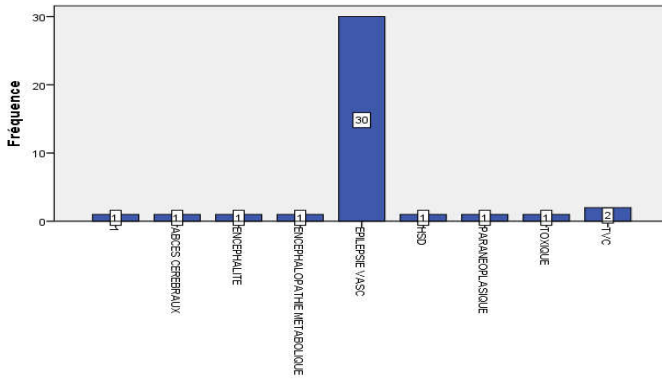

Figure 2. Etiologies of epilepsy of the elderly in our series

Evolution

In 79.5% of our patients, crisis remission was achieved with the MAE used. However, eight patients had died a fatality of 20.5%. This death occurred from the first day to 1 month of hospitalization with peaks between J1 and J6 (37.5%) and between J14 and J30 (37.5%). This mortality was not statistically related to sex or age (P=0.19). It was also not related to the condition of epilepsy or the type of seizure (P=0.947) or biological abnormalities (P=0.743). It was not related to etiology (P=0.961) or history (P=0.761). On the other hand, it affected patients with disorders of consciousness with a P-value of 0.033 with the Pearson correlation tests, khi2 and the ANOVA test.

DISCUSSION

Epidemiological Data

The hospital prevalence of 5.78% confirms the high frequency of epilepsy of the elderly in our service. This prevalence is similar to that found by Kuaté in Cameroon (Kuate-Tegueu Callixte *et al.,* 2015). And very low compared to that observed in industrialized countries which is 7 per thousand at all ages (Jallon and Assal, 2003), 7.7 per thousand for people aged 55-65, 6.8 for people aged 65-74 and 14.8 for patients aged over 74 in Rochester, USA (Hauser *et al.,* 1991) and 0.9% for the 55 - 94 age group and 1.2% for the 85 - 94 age group in France (De la Court *et al.,* 1996). The reason for this difference is that our prevalence was obtained in hospitalized patients while the studies of industrialized countries concerned the general population. In our series, the average age of patients was 72.33 8.79 with extremes between 60 and 94 years. This result is higher than that of Kuaté in Cameroon (Kuate-Tegueu Callixte *et al.,* 2015). But lower than the study conducted in Guinea-Conakry with an average age of 79 years for extremes of 65 and 89 years (Morel *et al.,* 2012). These differences can be explained by the age limits introduced during recruitment. Thus, the maximum age of 94 years in our study is a dilution factor in contrast to the minimum age of 65 years used in the Guinean study. Viteau in his PhD thesis in Medicine had found an average age of 81.6 years (Viteau Anne-laure, 2007). This difference could be linked to the higher life expectancy in France. A female predominance was observed with a sex ratio of 1.05. This finding was made by Viteau (Viteau Anne-laure, 2007). However, female predominance remains a controversy, with several authors, such as Kuaté in Cameroon (Kuate-Tegueu Callixte *et al.,* 2015), Maïga in Mali (2013) and Touré in Senegal (Touré Kamadore, 2017) finding male predominance.

Electro clinical Data

Focal seizures predominated slightly with 51.3% versus 43.6% of generalized seizures. This predominance corroborates the literature Jallon and Assal, 2003; De Toffol, 2004; Morel *et al.,* 2012 ; Viteau Anne-laure, 2007; Touré Kamadore *et al.,* 2017; Masnou, 2001; Westmoreland and Klass, 1981). This is explained by the importance of focal lesions in older subjects. However, the importance of generalized crises can be explained by the difficulty of recognition of the focal beginning, often by lack of reliable witnesses or by the existence of frequent memory disorders at this age. The rarity of non-convulsive manifestations is not consistent with literature (Valton Luc and Jallon Pierre, 2009). This rarity could be explained by the lack of knowledge by doctors of epilepsy of the elderly (Waterhouse and Towne, 2005). The scarcity of tongue bite and urine loss found in our study corroborates with literature (Vespignani *et al.,* 2002; Mahmoudi Rachid *et al.,* 2009). The state of epilepsy was common and affected 41% of our patients equally between the state of generalized and partial evil. This high frequency is consistent with the literature. In fact, the incidence of the condition of epilepsy is multiplied by 10 in the elderly (Vignatelli and Tonon, 2003). In our study, there was an absence of epileptic-type abnormalities in half of the EEG patients. This is consistent with the literature as EEG is less contributory to the diagnosis of epilepsy in older people (Derambure Philippe, 2009; Giroud *et al.,* 1994).

Etiologies of Epilepsy in the Elderly

The most common etiology of our study was ischemic stroke. This predominance has been observed in almost all literature concerning the epilepsy of the elderly. The predominance of ischemic forms was also observed by Sounga in Congo Brazzaville (Sounga Bandzouzi Prince Eliot Galieni *et al.,* 2020). However, this predominance of ischemic forms a controversy. Indeed, hemorrhagic forms are the most likely to produce crises, whether contemporary or remote (Gilles Berrut and Marion Cubillé, 2009; Verny Marc and Greffard Sandrine, 2019). Initial seizures (at the same time as the stroke) and early seizures (within the first seven days of the stroke) are the most common in our series. This finding is consistent with the literature (Quirins *et al.,* 2019).

Anti epileptic drugs

Carbamazepine was the most widely used anti-epileptic drug (61.5%) followed by Phenobarbital (35.9%). At Cameroun (Kuate-Tegueu Callixte *et al.,* 2015) Phenobarbital was more used followed by carbamazepine; and in Mali, valproate followed by carbamazepine (Maiga *et al.,* 2013). In these studies, as in several studies in the literature, monotherapy has been rigorous. The prescription of so-called old anti-epileptic drugs in several African studies is different from western studies where new anti-epileptics are preferred (Vignal, 2006). Our therapeutic choice is explained by the hybrid profile with a fairly good tolerance of carbamazépine with multiple indications (neuropathies, mood stabilizer, etc.) at this age.

Evolution

The outcome was favorable in 79.49% of our patients with complete remission of seizures on treatment. However, a mortality of 20.51% was observed. This mortality was

unrelated to age, gender, and status epilepticus. But it was rather linked to disturbances of consciousness statistically. This observation also made by Velioglu (Velioğlu *et al.,* 2001). Mortality is largely explained by the brain injury involved but also complications (Masnou, 2001).

Conclusion

Epilepsy is common in the elderly. Its hospital prevalence at the I P NDIAYE neurosciences clinic at CHU Fann was around 5.78% of all hospitalized patients. Predominantly ischemic stroke was the most common cause of epilepsy, the manifestations of which were dominated by focal tonic-clonic seizures. Curiously, we note a high frequency of generalized seizures and the rarity of non-convulsive manifestations. The clinical course under anti-epileptic treatment represented by carbamazépine and Phenobarbital as a monotherapy was favorable in more than 79% of cases with mortality not necessary linked to epilepsy of the order of 20.51%.

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