

Purpose

Post-stroke seizure (PSS) and post-stroke epilepsy (PSE) are common causes of hospital admissions, as a presenting feature or as a complication after a stroke. The occurrence of PSS lead to poor prognosis and increased mortality (mortality rate is higher than for all other causes: 4.3% and 3.0%). PSS is classified in: “early” within the first week, and “late”, with a peak within 6 to 12 months.

There are several causes for early onset seizures after ischemic stroke: increase in intracellular Ca and Na, glutamate excitotoxicity, hypoxia, metabolic dysfunction, hypoperfusion and hyperperfusion injury. PSS predictors include stroke severity, cortical symptoms, hemorrhage, anterior circulation infarcts, younger age at stroke (< 65 years).

While many physicians prescribe antiepileptic drugs (AEDs) for secondary prevention, it is unclear which treatments are most effective for the recurrence, or whether AEDs are needed for primary prevention. The 2013 International League Against Epilepsy (ILAE) report suggested that Carbamazepine, Levetiracetam, Phenytoine, Zonisamide have ‘level A’ evidence, being efficacious and effective as an initial monotherapy in adults with PSE, because of the lower rate of recurrence and fewer side effects.

Methods and results

The analysis was conducted on patients who were admitted to Stroke Unit of University Hospital of Trieste from January 2015 to December 2016. We selected patients who had an epileptic seizure within 7 days ischemic stroke’s onset. Over 522 patients admitted to our SU for acute stroke, 21 (4%) presented PSE within 7 days from admission.

Mean age was 75 years (range 40 to 90 years). 9 patients (42%) were treated with endovenous thrombolysis. Mean length of stay was 25 days (range 3 - 59). 2 patients (10%) were discharged home; otherwise patients were settled to a Rehabilitation Department, other hospital or nursing home.

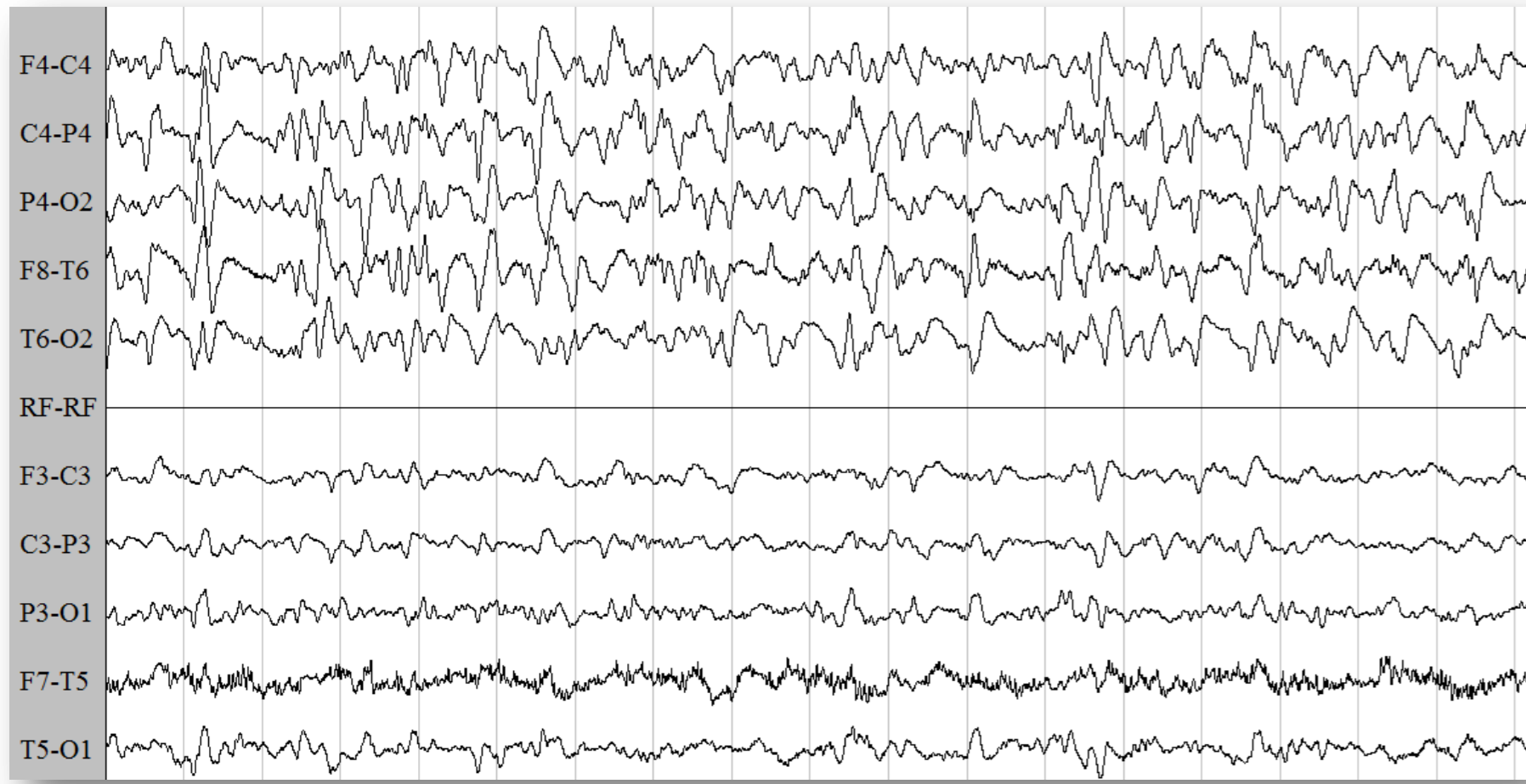
Concerning the stroke severity, mean NIHSS at admission was 14 (11 at discharge); mean mRS at discharge was 5.

In most cases the stroke involved the anterior circulation, 2 cases had a posterior stroke, in 11 patients at least 2 cerebral lobe were affected. A main artery occlusion was detected in 11 cases. 5 patients experienced a secondary hemorrhage (2 clinically symptomatic).

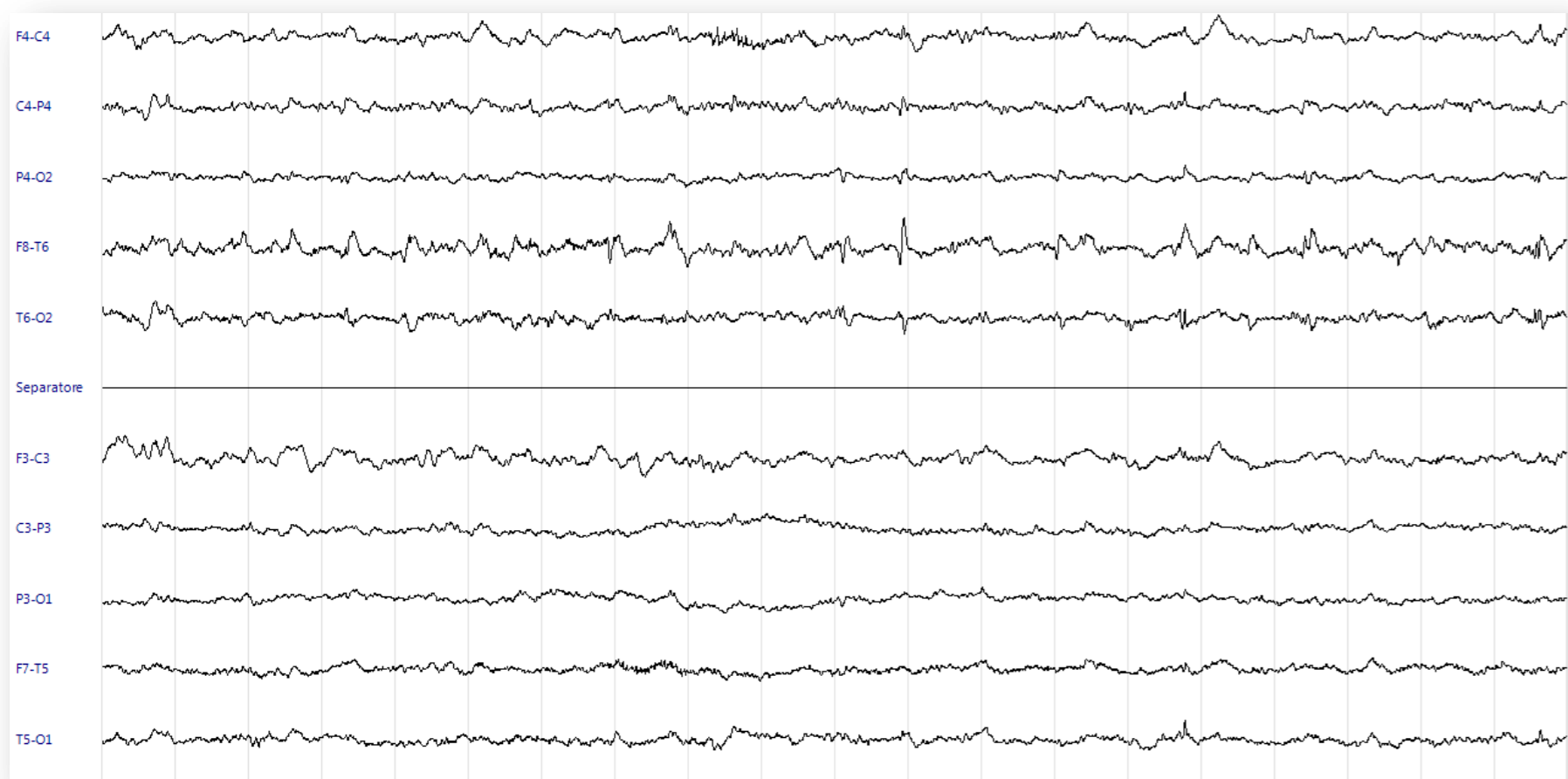
7 patients had a dysionemia, 15 intercurrent infection (urinary or broncopulmonary).

2 patient had a Status Epilepticus (10%). EEG showed a focal slowing in 19 patients, 10 patients showed epileptiform discharges.

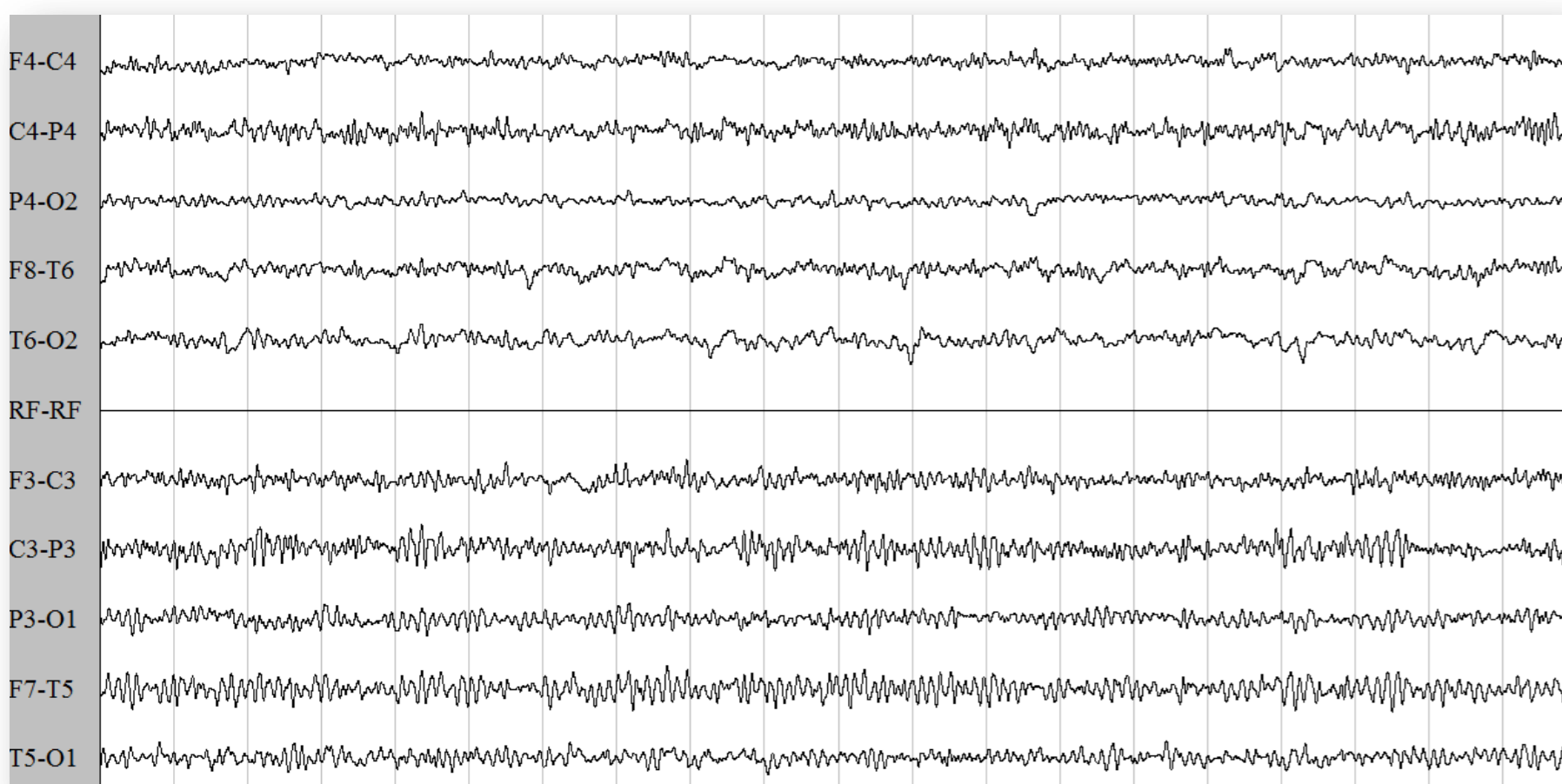
Almost all patients were treated with Levetiracetam, one with Oxcarbazepine, one received no AEDs.



A 68 y old woman EEG, affected by a right haemispheric stroke, which shows a continuous epileptiform activity on the right emisphere. She had a NCSE in hyperacute phase of ischemic stroke.

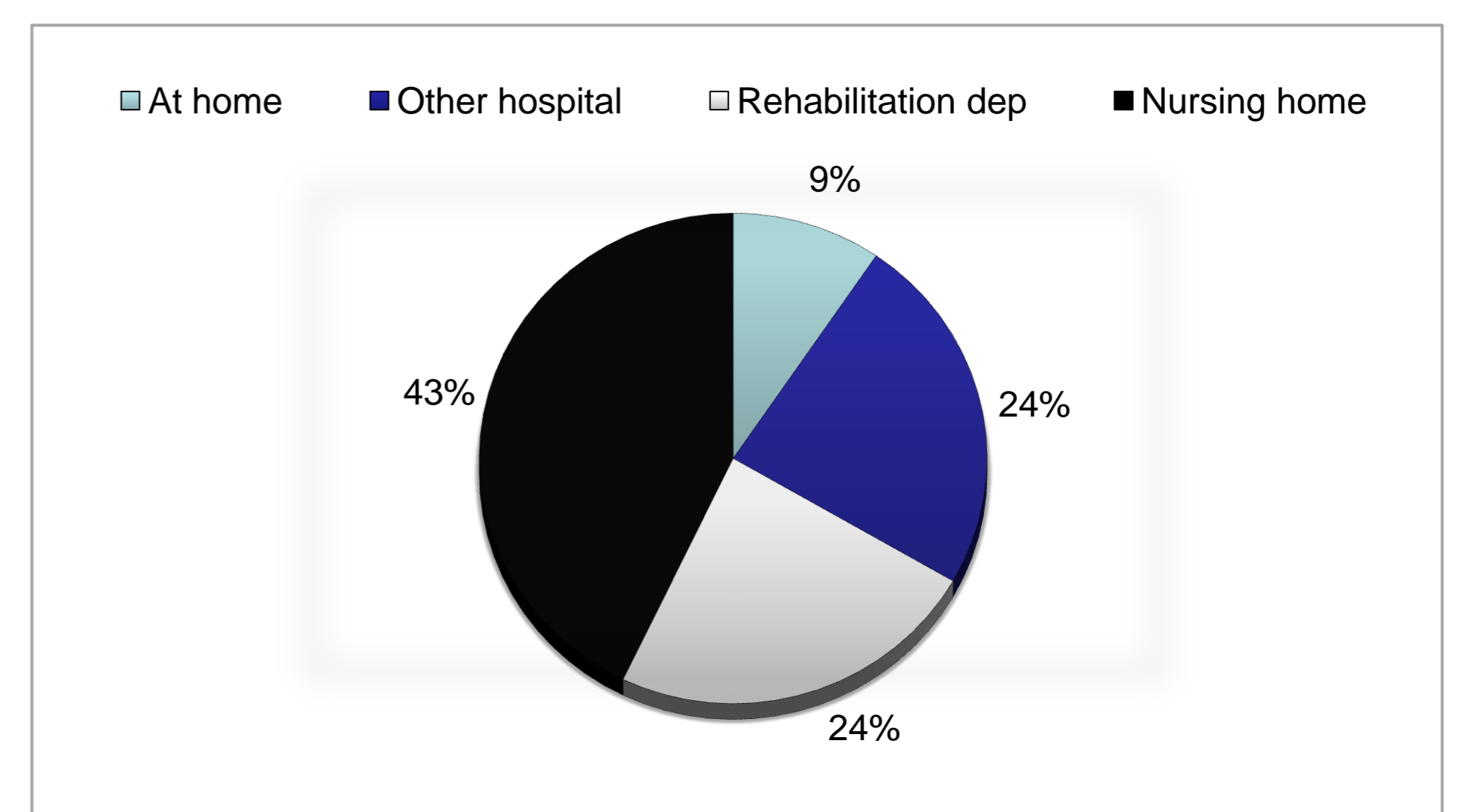


A 75 y old man EEG, affected by a right haemispheric stroke, which shows a slowing on the right electrodes, with epileptiform discharges. He hadn't experied a seizure after stroke.



A 72 y old woman EEG, affected by a right haemispheric stroke, which shows a slowing on the right electrodes, without epileptiform discharges. She had a seizure 3 days after stroke.

Patients characteristics	
Mean age	75 years (40-90)
EV thrombolysis	21 patients (42%)
Mean lenght of stay	25 days (3-59)
Mean NIHSS at admission	14 patients
Mean NIHSS at discharge	11 patients
Mean mRS at discharge	5 patients
Imaging	
Anterior circulation	19 patients
At least 2 lobe affected	11 patients
Main artery occlusion	11 patients
Complications	
Secondary hemorrhage	5 patients (2 clinically symptomatic)
Dysionemia	7 patients
Intercurrent infection	15 patients
EEG	
Status epilepticus	2 patients
Focal slowing	19 patients
Epileptiform discharges	10 patients
Therapy	
LEV	19 patients
OXC	1 patients
None	1 patients



This chart shows destination of patients at discharge.

Discussion

The collected data suggest that acute seizure incurred more often in patients with severe stroke, as demonstrated by NIHSS value and neuroimaging. Prognosis of these patients was severe, considering that few of that returned directly at home after hospitalization and the Rankin rate at discharge was high. As confirmed by literature, much of the stroke involved anterior circulation. Compared to literature, our sample was older.

As concerning therapy, Levetiracetam appears to be good choice considering the mean age of our sample, as represent a safe and appropriate drug in elderly patients. Furthermore, a recent study showed that Levetiracetam inhibited inflammatory responses and reduced reactive gliosis in animal model, suggesting it could be an important agent in the prevention of epileptogenesis.

Conclusions

PSS has a higher incidence in older people; leads to higher mortality rate and disability. AEDs have been shown to be effective and safe. A decisive approach for an early diagnosis and treatment is required.

Stroke is a condition that is increasing in frequency and a major cause of disability in the occidental world. For this reason it is important to prevent complications finding risk factors and establishing appropriate therapy for these.