

# Childhood Frontal lobe Epilepsy in the population of Algiers

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## Abstract:

**Background:** The semiology of frontal seizures is enriched with age. frontal seizures having a more crude semiology in young children than in older children. Our aim was to describe the clinical semiology of childhood-onset frontal lobe epilepsy in the population of Algiers.

**Materials and Methods:** 29 patients were identified with frontal lobe epilepsy. The patients had childhood-onset frontal lobe epilepsy before age 15 years, which had been documented between January 2012 and December 2013. The age at seizure onset, onset seizure type, antecedent (illness or event) before the onset of frontal lobe epilepsy, semiology, and EEG recordings were studied.

**Results:** A total of 29 patients were selected. The patients were divided into five main groups according to likely semiology. Group 1 consisted of 5 patients (17.24 %) with Hemiclonic Jacksonian Motor Seizures, age (ranged from 1 to 9 years). Group 2 consisted of 5 patients (17.24 %) with bilateral asymmetrical tonic seizures (turning of head and eyes and posturing of arms and legs), age (ranged from 17 months to 14 years). Group 3 comprised 6 patients (20.70 %) with complex motor seizures, age (ranged from 3 to 12 years). Group 4 comprised 3 patients (10.34%) with brief lapses of awareness, age (ranged from 5 to 12 years). Group 5 comprised 10 patients (34.48%) with rapidly progress to generalized tonic clonic seizure.

**Conclusion:** The study suggests that semiology with rapid spread to generalized tonic-clonic seizure is more common, compared to motor semiology, in the setting of frontal lobe epilepsy in children in Algiers..

**Key Word:** Frontal lobe epilepsy, Childhood, Semiology

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## I. Introduction

The semiology of frontal lobe epilepsy described in adults is varied and depends on the initial focus in the frontal lobe. Some authors report differences in the semiology of seizures in children. The features of frontal lobe epilepsy are related to those of functional brain maturation. Frontal epilepsies have a peak onset after 2 years as if it takes some cortical activity for the seizures to become meaningful, even in the presence of an epileptogenic lesion that has formed well before birth.

The semiology of frontal seizures is enriched with age, frontal seizures having a more crude semiology in young children than in older children; even in the latter one can observe very crude behavioral crises, originating from the anterior regions of the frontal lobe, which are very difficult to identify. Frontal partial epilepsy may transiently associate with generalized epilepsy before the age of 10, and focal signs may be masked by generalized signs that take center stage.

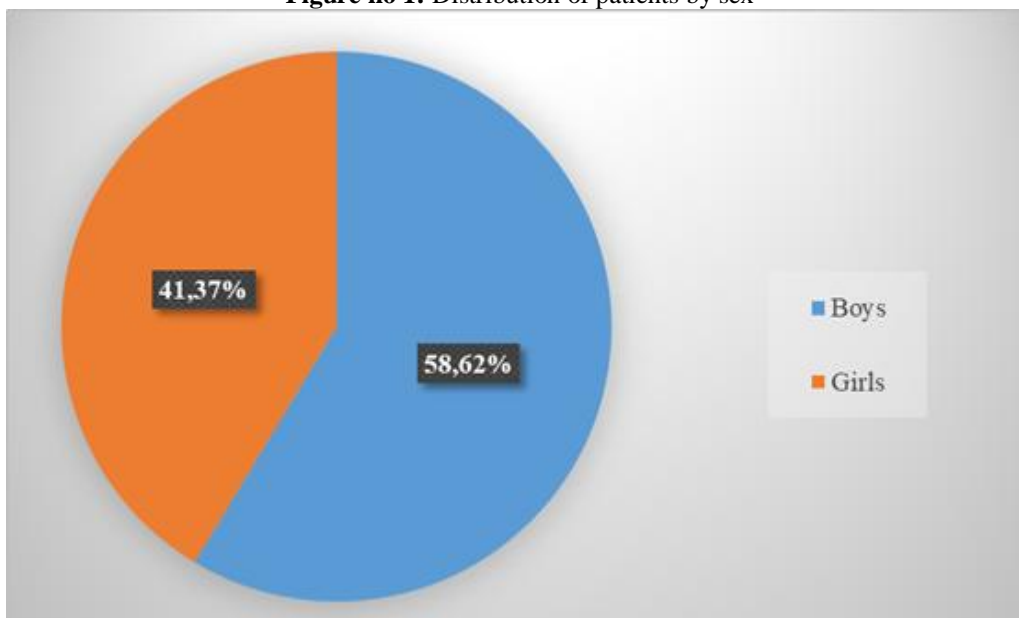
## II. Material And Methods

We retrospectively identified 29 patients with frontal lobe epilepsy before the age of 15, identified between January 2012 and December 2013. Age of onset of seizures, pathological history, type of seizure, semiology of seizures, neurological examination and EEG (electroencephalography) were studied.

## III. Results

A total of 29 patients were selected, 17 boys (58.62%) and 12 girls (41.37%) (Figure1). The age of onset of seizures varies from 17 months to 14 years. In the pathological history, we noted a delay in psychomotor development in 3 children aged 17 months, 2 years and 3 years respectively. Neonatal distress was noted in a 17-month-old child, and mental retardation was found in a 5-year-old case.

Figure no 1: Distribution of patients by sex



On the neurological level, we observed spastic tetraparesis in one case and static cerebellar syndrome in one patient.

The patients were divided into five main groups according to their semiology: (Figure 2)

Group 1: Was composed of 5 patients (17.24%), aged 1 to 9 years, with Jacksonian hemiclonic motor seizures.

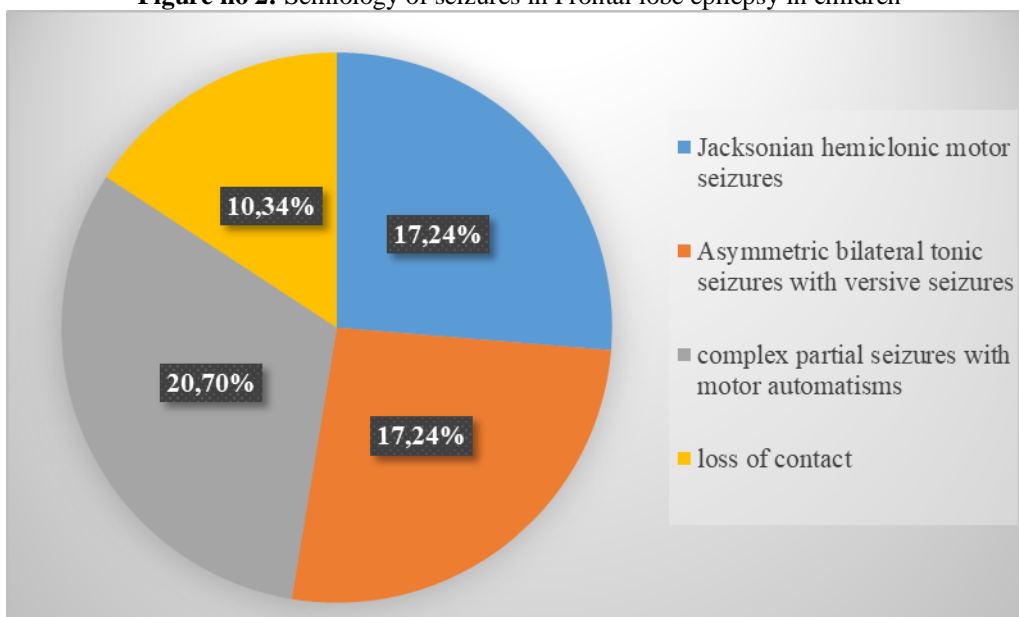
Group 2: Was composed of 5 patients (17.24%), aged 17 months to 14 years, presenting asymmetric bilateral tonic seizures with versive seizures of the head and eyes with increased postural tone.

Group 3: Included 6 patients (20.70%), aged 3 to 12 years, presenting complex partial seizures with motor automatisms.

Group 4: Included 3 patients (10.34%), aged 5 to 12 years, presenting a brief disturbance of consciousness (loss of contact).

Group 5: Included 10 patients (34.48%), aged 6 to 14 years presenting a semiology which had quickly progressed to a generalized tonic-clonic seizure.

Figure no 2: Semiology of seizures in Frontal lobe epilepsy in children



On the electrical EEG level, we recorded frontal focal abnormalities in twenty-one cases, and secondarily diffuse frontal focal abnormalities in eight cases. Frontal focal ictal and interictal abnormalities, such as spike or slow-wave focal activity, were present in all of our patients.

#### **IV. Discussion**

A Jacksonian march or very localized clonic motor phenomena evoke a Rolandic participation. Oral-linguo-facial clonies with aphaemia indicate involvement of the very inferior part of the motor zone (rolandic operculum). An adersion is responsible for a position similar to a tonic postural neck reflex. Sometimes accompanied by vocalization suggest involvement of the additional motor area of the medial aspect of the frontal lobe. Rather, a jerky conjugate deviation of the head and eyes indicates the involvement of the convexity of the contralateral frontal lobe. When the loss of consciousness is immediate and precedes the deviation of the head and the eyes, an involvement of the polar front must be suspected. When the discharge concerns the middle frontal convexity (area 8), the patient is usually conscious during ocular deflection. The critical EEG typically shows rapid and weak activity, responsible for a well-localized diffuse flattening.

##### **1. General characteristics of frontal lobe seizures**

The study of frontal lobe seizures and their anatomo-clinical correlations during simultaneous EEG video recordings has made it possible to identify general characteristics of these seizures:

- occurred willingly during sleep
- crises occurring in an (explosive) way with very abrupt start and end with little post-critical confusion
- seizures in series, of short duration, very frequent
- focal or / and asymmetric postural modifications
- "violent" automatisms with strong handling

Emotional manifestations can also be observed in some forms of frontal seizures. Motor manifestations, however, generally dominate the semiology of these seizures.

##### **2. Analytical semiologies of frontal crises**

Different symptoms can be observed in frontal attacks. Reported subjective manifestations, especially in aura form, are rarer than in temporal crises. One of the most puzzling aspects are the automatic and gestural manifestations, increasingly described in this context and which are observed especially in prefrontal seizures.

###### **2.1 Subjective semiology**

-Sensory manifestations :

- Vague cephalic impressions, chest tightness, exceptional visuals (blurred vision, exceptionally hallucinations)

-Dysautonomic symptoms : abdominal or thoracic striction, palpitations, urination, heat, shivering

-Emotional symptoms : fear, terror, feeling of near death  
Cognitive symptoms: forced thinking, feeling of blurred thinking

###### **2.2 Objective semiology**

-Dysautonomic : tachycardia, respiratory changes, pallor, reddening, urination.

-Somatomotor :

- localized motor signs (tonic, clonic)
- localized or more diffuse postural changes
- ispi or contraversion of the eyes, head and sometimes trunk

-Oral or verbal :

- language stop
- simple vocalizations (growl, cry) or more complex (words, sounds complex)

-Complex motor behaviors and automatisms:

- brief, repetitive
- sometimes simple (tapping your foot, your fingers, crossing / uncrossing your legs, rocking back and forth, pedaling)

-complex eupractic gestural automatisms

- "dyspractic" gestural automatisms, hyperkinetic (agitation messy)

-Consciousness :

- preserved (subsequent seizures)
- precociously altered (prefrontal seizures)

The main areas of the frontal lobes include; Primary motor areas (precentral gyrus); sensorimotor areas, the posterior part of the superior frontal gyrus, paracentral lobule, inferior frontal gyrus. Negative motor areas are represented behind the inferior frontal gyrus and in the mesial superior frontal gyrus.

The semiology of frontal lobe seizures with predominantly positive motor symptoms can be grouped into:

1 / Classic and hemiclonic Jacksonian motor seizures are the easiest to locate.

Consciousness is generally preserved. There may be a short nonspecific or sometimes somatosensory aura.

2 / Complex partial seizures with automatisms manifested by versive seizures of the head and eyes, with a tonic postural grip of the upper limb contralateral to the discharge. Motor automatisms can occur. Vocalization at the onset of the seizure is also common. These seizures can occur in the anterior supplementary motor region and the lateral premotor cortex.

Seizures that arise from the polar anterior face, anterior cingulate, opercular-insular and orbital-frontal regions, can manifest as an experiential or psychic aura, and therefore these can cause confusion with the temporal lobe. There may be an aura including epigastric sensations and olfactory hallucinations. Vegetative manifestations are common, for example facial flushing or pallor, tachycardia, pupil dilation and urinary incontinence. Stopping of speech can be seen especially in dominant hemisphere seizures. Motorized automatisms are common.

The other types of seizures are rarer and include seizures characterized by brief disturbance of consciousness and which are mainly observed during frontal mesial, fronto-polar, or orbito-frontal seizures.

You should know that epileptic discharges can spread very quickly between the hemispheres leading to a generalized tonic-clonic seizure.

## V. Conclusion

The study suggests that semiology with rapid spread to generalized tonic-clonic seizure is more common, compared to motor semiology, in the setting of frontal lobe epilepsy in children in Algiers.

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