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EEG and clinical presentation of Childhood and Juvenile Absence Epilepsy in the population of Algiers

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Abstract:
Background*: Childhood absence epilepsy is a generalized idiopathic epilepsy occurs in children of school age. Juvenile Absence Epilepsy is a generalized idiopathic epilepsy with an age of onset around puberty. Our aim was to analyze EEG and clinical presentation of childhood and juvenile absences in Algiers population.*
Materials and Methods*: We retrospectively analyzed 45 patients with Childhood and Juvenile absence epilepsy. All patients had clinical information, video-ictal EEG recording and medication used.*
Results*: Among 45 patients seen between 2009 and 2013, we observed 45 patients with Absence Epilepsy.26 cases of Childhood absence epilepsy.19 cases of Juvenile absence epilepsy.*
Conclusion: *Absences were severe and the only seizure type in Childhood absence epilepsy. Absences were non-predominant in Juvenile absence epilepsy. 3HZ spike and slow wave complexes were seen in Childhood absence epilepsy.3, 5 HZ spike and slow wave complexes were seen in Juvenile absence epilepsy.*
Key Word*: Childhood absence epilepsy; Juvenile absence epilepsy; Absences; Generalized tonic-clonic seizure; Ictal-EEG.*

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I. Introduction

Childhood absence epilepsy is one of the most common epileptic syndromes, accounting for 10% of pediatric epilepsies. Child absence epilepsy can be difficult, even for specialists. Affected children are at risk of learning difficulties. Early diagnosis with therapeutic management helps prevent school failure and low-level psychosocial outcomes.

Juvenile absence epilepsy is a generalized idiopathic epilepsy characterized by a genetic predisposition, an age of onset around puberty and the absence of neurological or intellectual deficit. Absences are typical and are present in most cases, but they are longer and less frequent, than in Child Absence Epilepsy. Generalized tonic-clonic seizures are observed in 80% of cases.

In the syndromic classification of the International League Against Epilepsy, (ILAE) (Commission, 1989), Child absence epilepsy is a generalized idiopathic epilepsy thus defined: pyknolepsy occurs in children of school age (peak at 6 -7 years old), with a strong genetic predisposition. Moreover, in normal children, it is more common in girls than in boys. It is characterized by very frequent absences (several per day). The EEG shows bilateral, synchronous and symmetrical wave spikes, usually at 3HZ, on background, normal activity.

According to the classification of epilepsies and epileptic syndromes (commission, 1989), "the absences of Juvenile absence epilepsy are the same as in pyknolepsy but the absences with retropulsion are less frequent. The manifestations occur around puberty. The frequency of seizures is lower than in pyknolepsy, with absences

occurring less frequently than daily, mostly sporadically. Generalized tonic-clonic seizures are frequent, often occurring in the morning upon awakening. They precede the onset of absences, more often than Child Absence Epilepsy. Exceptionally, patients also have myoclonus.

II. Material And Methods

This is a retrospective study carried out in the EEG laboratory, over a period of 5 years, from January 2009 to December 2013, including 45 patients with absent epilepsies, according to clinical data, the age at the onset of seizure, critical video-EEG recording, and antiepileptic treatments used. We have divided our patient population into Child absence epilepsy and Juvenile absence epilepsy . We used the criteria defined by the International League Against Epilepsy.

Inclusion criteria: for Childhood absence epilepsy (CAE)

1. Beginning between 4 and 10 years.
2. Normal development, normal neurological state.
3. Short absences (4-20 seconds, exceptionally more), and frequent (dozens per day) with sudden and complete
   loss of consciousness, frequent automatisms, without diagnostic or prognostic significance.
4. Critical EEG discharges of generalized spike-wave complexes of large amplitude, with only one or two spikes (exceptionally three), rhythmic around 3 Hz, with a slight slowing down, progressive and regular, between the beginning and the end of the stroke. Their duration ranges from 4 to 20 seconds.

Exclusion criteria: for Childhood absence epilepsy (CAE)

1. Absences with marked eyelid or perioral myoclonus, single or rhythmic limb and trunk myoclonic jerks
2. Absence with mild or not clinically detectable consciousness impairment
3. Other types of epileptic seizures in early stages (infrequent Generalized tonic-clonic seizures in adult life may occur in no more than 3% of patients)
4. Stimulus-sensitive absences (photic, pattern, fixation-off sensitive)
5. Discharge fragmentation (within one second) and multiple spikes
6. Irregular, arrhythmic spike and multiple spike and slow wave discharges with marked variations of the intradischarge frequency or of the spike and multiple spike and slow wave relations.
7. Predominantly brief discharges of less than four seconds
8. Posterior rhythmic slow activity is accepted and probably favors diagnosis

Inclusion criteria: for juvenile absence epilepsy (JAE)

1. Typical absences manifested by abrupt and severe impairment of consciousness (less than CAE) which occur
   less frequently (one to ten per day) than in CAE
2. Age of onset of absences is at seven to 16 years (peak at 10–12 years)
3. Random and infrequent myoclonic jerks as well as infrequent GTCS in majority of patients
4. Lifelong disorder, absences tend to become less severe and frequent
5. Regular complexes of generalized spike or multiple spike and slow waves at 3 Hz and discharge fragmentation may be present

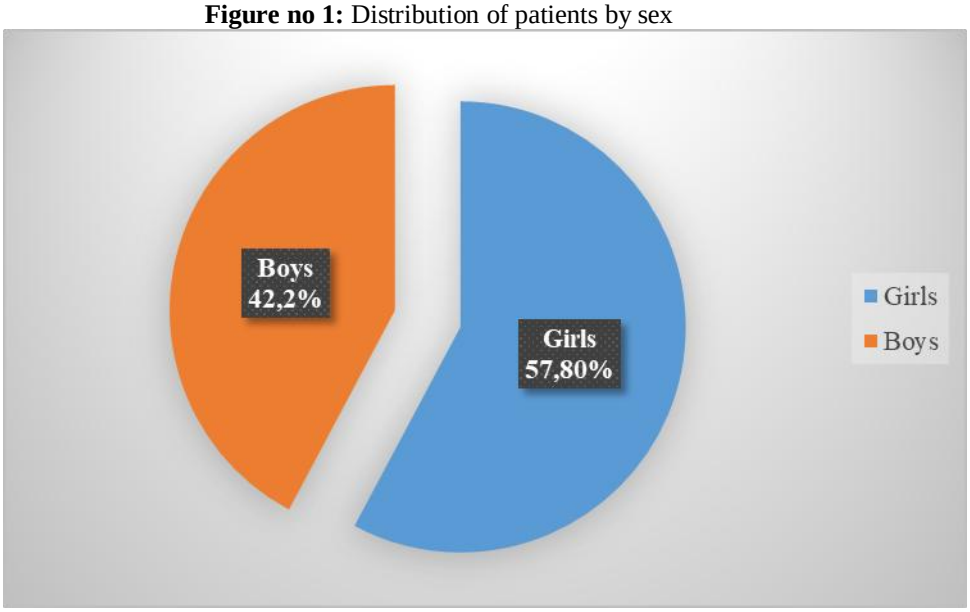
Exclusion criteria: for juvenile absence epilepsy (JAE)

1. Absences with marked eyelid or perioral myoclonus, single or rhythmic limb and trunk myoclonic jerks
2. Absence with exclusively mild or clinically undetectable impairment of consciousness
3. Irregular, arrhythmic spike and multiple spike and slow wave discharges with marked variations of intradischarge frequency or of spike and multiple spike and slow wave relations
4. Predominantly brief discharges (less than 4 s)

III. Results

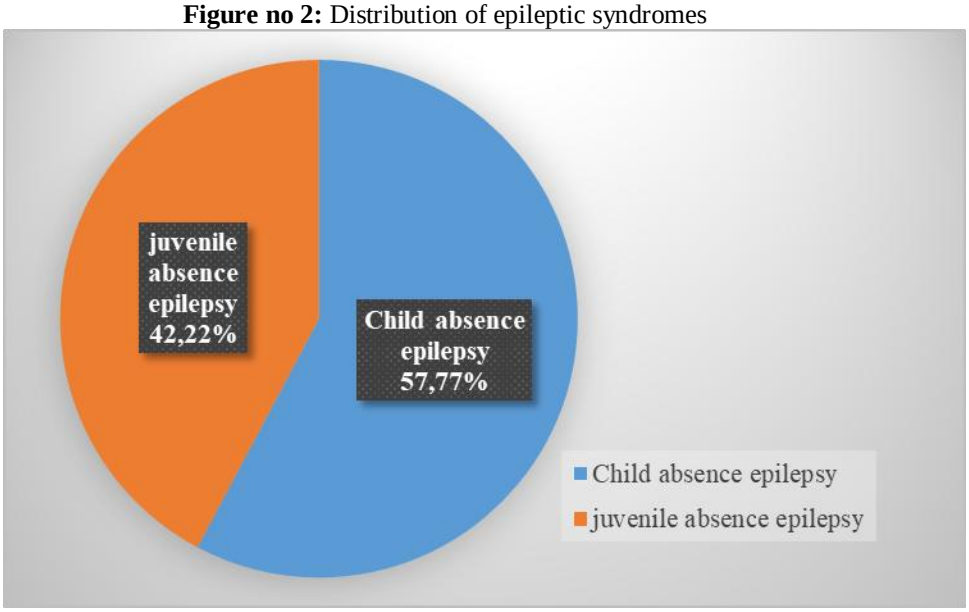
Our series consisted of 26 girls (57.8%) and 19 boys (42.2%): Figure 1. The age of onset of seizures in Childhood Absence Epilepsy was between 4 and 10 years. The age of onset of seizures in juvenile absence epilepsy was between 10 and 17 years.

Figure no 1: Distribution of patients by sex



Epileptic syndromes including 26 cases of Child absence epilepsy and 19 cases of juvenile absence epilepsy: Figure 2.The seizures at the beginning were absences for the patients with Childhood absence epilepsy; in contrast they were generalized tonic-clonic seizures, for the patients with juvenile absence epilepsy.

Figure no 2: Distribution of epileptic syndromes



On the critical EEG level, we recorded epileptic abnormalities such as 3 Hz spike-slow wave discharges in patients with Childhood Absence Epilepsy and slow-wave peak discharges, at a frequency of 3.5 Hz in patients with juvenile absence epilepsy.

Therapeutically: Figure 3 and 4, valproic acid was able to control seizures in 88.5% of patients with Child absence epilepsy and in 88.2% of patients with juvenile absence epilepsy. Lamotrigine was used in 3 patients (11.5%) with Child absence epilepsy and in one patient (15.8%) with juvenile absence epilepsy.

Figure no 3: Therapeutic choice in childhood absence epilepsy

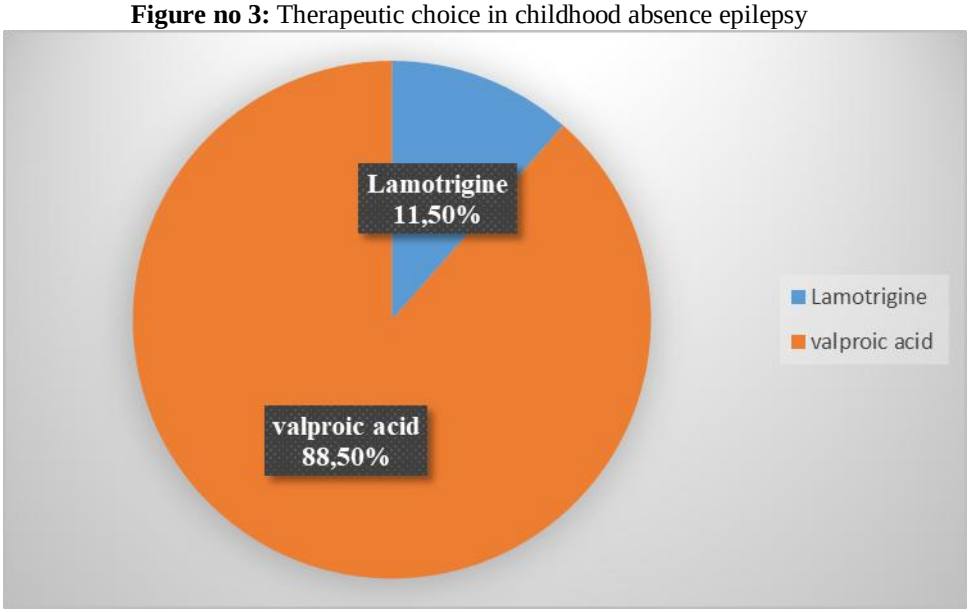
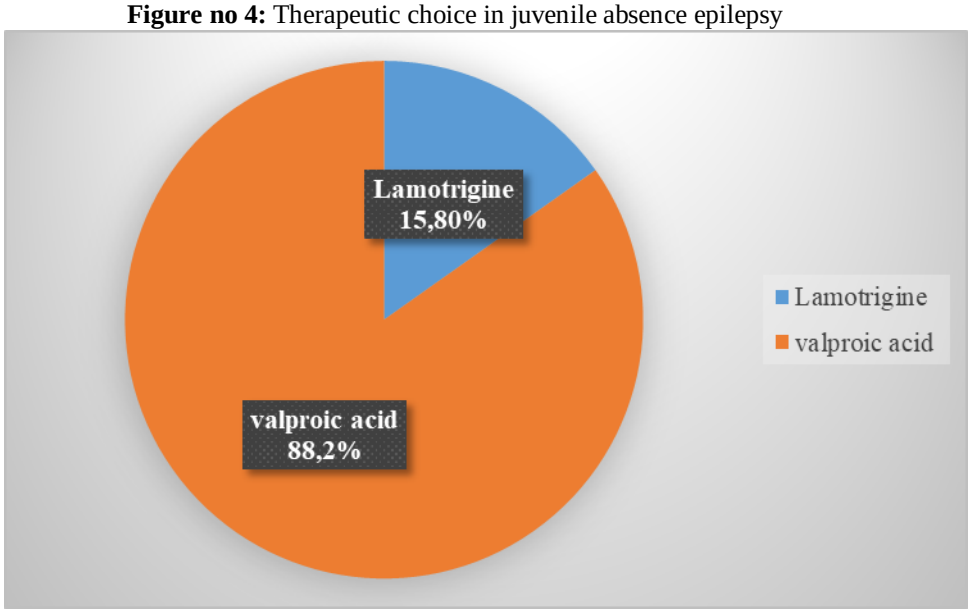


Figure no 4: Therapeutic choice in juvenile absence epilepsy



IV. Discussion

Concerning childhood absence epilepsy (CAE), our results are consistent with the data in the literature

(Panayiotopoulos, 2008) [1] where epilepsy in the absence of children, is considered to be generalized idiopathic epilepsy, related to age, occurring in otherwise normal children, girls more often than boys, with a strong genetic predisposition.

The age of onset is between 4 and 10 years, peaking at 5-7 years. Childhood absence epilepsy (CAE) is the archetype of childhood epilepsy syndromes with typical absences. Absences are severe and frequent, from tens to hundreds a day. They range in length from 4 to 20 seconds, but most last around 10 seconds. Clinically, there is a sudden and severe alteration of consciousness (complete loss), with cessation of voluntary activities, throughout the absence. Automatisms are frequent but not significant. The eyes are fixed, eyelid blinks (usually inconspicuous) may occur. Generalized tonic-clonic seizures and other types of seizures should not be signs of childhood absence epilepsy (CAE). A discreet alteration of consciousness or a consciousness remaining normal, are incompatible with this diagnosis.

Regarding juvenile absence epilepsy (JAE), our clinical data agree with those reported in the literature (Panayiotopoulos; 2010) [2], (Koutroumanidis; 2017) [3] where the absences consist of spikes-waves and polyspikes-waves at 3.5-4 Hz, bilateral and synchronous with an earlier predominance.

Therapeutically, due to the frequent association of absences and generalized tonic-clonic seizures, the first-line drug is valproic acid. In case of side effects, Lamotrigine can be given (Wheless, 2005) [4], (Wheless, 2007) [5].

V. Conclusion

Our study population consists of 45 patients, recruited over a 5-year period from 2009 to 2013. The age of onset of seizures in Childhood absence epilepsy (CAE) was between 4 and 10 years. The age of onset of seizures in Juvenile Absence Epilepsy (JAE) was between 10 and 17 years old. There is a female predominance (57.8% girls against 42.2% boys). Epileptic syndromes include 57.8% Childhood absence epilepsy (CAE) and 42.2% Juvenile absence epilepsy (JAE). Absences were severe and were the only type of seizure in Child absence epilepsy (CAE), but not predominant in Juvenile absence epilepsy (JAE). Generalized tonic-clonic seizures were recorded in most patients with Juvenile absence epilepsy (JAE). The electrical characteristic was the recording of spike-slow wave type discharges at a frequency of 3 Hz in Childhood absence epilepsy (CAE) and 3.5 Hz in Juvenile absence epilepsy (JAE). The response to antiepileptic therapy with valproic acid was excellent in both epileptic syndromes.

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