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EEG changes in Autism spectrum Disorder in tertiary care hospital

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ABSTRACT

Introduction: ASD is a neuro-developmental disorder characterized by impairment of communication, behavior and socialization. About a third of children with ASD have epilepsy. Most of the cases are associated with some form of movement disorder mimicking epilepsy. However, few cases show epileptiform discharge on EEG without clinical seizure. Rationale: Seizure and pseudoseizure differentiation is important issue in ASD cases to administer AED. Method: Sixty children with ASD had undergone EEG. A questionnaire was filled up with clinical parameter and EEG findings. All findings were analyzed. Result: Mean age at presentation was 36 months. M:F ratio was 3:1. All children presented with core symptom of impairment in verbal and nonverbal communication and behavior problem. EEG was abnormal in 47% case.Among them focal discharge 6(10%), generalized discharge 16(17%), others 6(10%) were found. Conclusion: Fair number of EEG changes was present in ASD cases without symptomatic seizure. This cases need further evaluation for management.

Key Words: ASD, EEG, AED.

INTRODUCTION

Pervasive developmental disorder(PDD) or Autism Spectrum disorder (ASD) encompass a heterogeneous group of individuals with early childhood onset of deficit in social interaction and language proficiency , and a restricted repetitive of interest and activities and a wide range of cognitive competence.[1-3] Epileptiform discharge and cognitive symptoms (EDCS) is a group where epileptiform discharges in the absences of seizure may be responsible for the symptoms of cognitive language and behavioral dysfunction.[4]

One of the best known associations with CNS dysfunction is the high risk of epilepsy and reported to occur in 1/3rd of individuals with ASD.[5] There is no primary seizure type or syndrome associated with autism, complex partial, absence or generalized tonic clonic have all been reported.[6-7] There are many reports of background or inter ictal EEG changes in individuals with autism. It is important to note that these abnormalities may occur in individuals without seizures and there presence should be considering evidence of epilepsy.[7] Both nonspecific changes such as slowing or asymmetry and discharge, consisting of spike and sharp wave discharge, sharp slow waves , generalized spike wave and generalized poly spikes were seen. Kagan-kushnir et al 2005 described the effectiveness of anticonvulsant and corticosteroids in reducing autistic symptoms.[8] Frye et al (2010) found 22 children with atypical cognitive development didn't respond to standard educational therapy , had been treated with AEDs and showed improvement in subsequent visit.[9] So IEDs in EEG without clinical seizure is interest of the study.

METHODOLOGY

This cross study was conducted in our outpatient department of IPNA, BSMMU. Consecutive 60 autistic children diagnosed by DSM-IV criteria and ADCL/ADOS and had an EEG tracing which was advised by a paediatric neurologist and or autism specialist. Children who were on antiepileptic drug or diagnosed as epilepsy or convening history of clinical seizure was excluded from study. An informed written consent was taken from guardian. After enrollment a through history regarding antenatal, natal, post natal, period any medical illness may lead to speech and communication difficulty were search and excluded through physical examination to see any physical stigmata for complex or symptomatic autism or co morbidity. All EEG were checked by an paediatric neurophysiologist for any abnormality if abnormality was present then finding level spike or sharp & wave poly spike and wave slow wave, burst suppression were recorded. Data were processed and analyzed by SPSS version 18. Finding was expressed in frequencies and percentages. Protocol was approved by the board of the Institute.

RESULTS

Sixty Children with Autism Spectrum Disorder diagnosed by DSM IV and ADCL criteria and EEG recording was done. Their demographic Characteristics and EEG findings were analyzed. Male Female ratio were 3:1, Mean age at Onset of diagnosis was 36 months and range 18-72 months. All patient had core symptoms of ASD like impaired verbal communication, associated with nonverbal communications and behavior problem. Co morbidity were present in 15 children that is 25% case . Consanguinity was present in four cases only. EEG changes was present in 28 patients out of this 6(10%) had focal discharges, 16(27%) generalized discharges. Other changes was 6 cases(Diffuse slowing-3).

Table 1: Demographic characteristics of study population

Varable	Number	Percentage
Male :Female	45:15	
Age at diagnosis	36 (18 -72)	
Impaired verbal communication	60	100
Impaired non verbal communication	60	100
Behavior problem	60	100
Co morbidity	15	25
Consanguinity	4:	93.3
Both ADCL & DSM IV positive	60	100

Table 1: EEG findings of study subject

EEG Change	Number	Percentage
Abnormal	28	47%
Focal discharge	6	10%
Generalized	16	27%
Epileptic Encephalopathy	0	0
Diffuse slow wave	3	5%
CSES	0	
Bilateral Discharge	1	1.7%
Others	2	3.3%

DISCUSSION

There is sample data supporting the observation that rate of epilepsy among children with ASD is significantly elevated. It is also well supported that a significant percentage of non-epileptic children with ASD exhibit IEDs, that is a large preparation of children with ASD with abnormal EEGs are unlikely to develop- seizure disorder.[10] The pressure of epileptic discharges in non-epileptic ASD patients could relate an end phenotype.

Complex neurodevelopment disorder may be characterized by subtle brain function signatures early in life before behavioral symptom. ASD is characterized by asynchronus neural oscillations. One potential neuroendophenotype of ASD is resting Frontal EEG alpha asymmetry,[11] a metric of hemispheric organization. Some author reported low and high risk infant show different pattern of alpha asymmetry at six months of age.

The type of language disorder and the relation of epileptiform activity and the developmental period in which the regression occur may be important in attempting to understand the relationship of autistic regression to epilepsy or epileptiform EEG activity.[12]

The recording of paroxysmal EEG activity from temporal area has been involved as evidence for interference with auditory or phonologic processing by epileptic activity.

The prevalence of regression in this sample is comparable with that in other studies. We found however that parents of children see to the first time before 3 years of age reported regression significantly more often then other parents of children seen at later childhood.

Previous studies of children with autism found an over all prevalence of IAEs ranging from 18% to 64%(R), a significantly greater then the 2.4% to 3.5% reported in normal children.This finding in our study mirror the higher end of the prevalence range in children with autism, probably because our study had the advantage of using prolonged continuous EEG recording.

Prior studies described a variety of focal, multifocal and generalized IAEs in children with autism, and focal centrotemporal sharp waves have been reported to be particularly com

CONCLUSION

Fairly large number of ASD children showed IEDs without clinical seizure. Prospective study with trial with AEDs may be attempted.

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