

Autism and Seisures in Children Admitted in a Tertiary Hospital

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Abstract: *Autism is associated with epilepsy in early childhood, with evidence suggesting that individuals with both autism and more severe cognitive impairment are at higher risk. The frequency of an abnormal electroencephalogram and/or epilepsy in children with Autism Spectrum Disorder (ASD) is not well defined. The aim of the study to estimate the prevalence of epilepsy and electroencephalographic abnormalities in children with ASD. Epilepsy was diagnosed in (26.7%) of children. Overall, the electroencephalogram was abnormal in (11%) of children whereas 89% of the children had normal electroencephalograms. Abnormal electroencephalogram was found in (26%) of children with epilepsy and in (5%) of children without epilepsy. Identification of children with increased risk for epilepsy has important implication for the prognosis and treatment of the disease.*

Keywords: autism, epilepsy, electroencephalography, children, disability

1. Introduction

Epilepsy is quite common in autism spectrum disorders, and it is increasingly recognized as an additional clinical problem that must be dealt with. Prevalence estimates have varied, but between 11 and 39% of individuals with autism have been reported to develop epilepsy (1). The frequency of epilepsy is much higher than the prevalence of active epilepsy in the general population, which has been estimated in a epidemiological study to be 0.63% at age 23 (2). A similar increase in the prevalence of epilepsy has been reported in individuals with intellectual disability (3). Despite the strong and well-established link, the basis for the association is poorly understood. The lack of progress in clarifying this stems from the presence of three major methodological limitations that have hampered progress in the identification of risk markers and factors. First, investigators have included various diagnostic subtypes in their reports of epilepsy in autism spectrum disorder, including individuals with Rett syndrome and childhood disintegrative disorders (where the rate of epilepsy is over 80–90%), as well as including individuals with 'other' forms of pervasive developmental disorder (4). Accordingly, the pattern of findings has been quite variable. Second, although individuals with autism sometimes do not develop epilepsy until late in adolescence, (5) this age-related risk has not been taken into account in the design of many studies or the data analysis. The studies conducted to date have not explored whether the familial liability for autism is correlated with the familial liability for epilepsy. This would be a test of the hypothesis that the genetic and environmental risk factors for autism also confer a risk for epilepsy. In this study, we aimed to address some of the shortcomings of previous research by examining the correlates of epilepsy in a sample of individuals with autism who have been followed-up into adulthood. Epilepsy occurs in 10–30% of individuals with autism. However, the association between autism and specific epileptiform electroencephalography (EEG) abnormalities is not firmly established; neither is the prevalence of epileptiform abnormalities in the broader range of autistic spectrum

disorders (ASD) (6). There is an increased prevalence of both epilepsy and abnormal potentially epileptogenic activity in children with ASD (7). About 10% of children given a diagnosis of autism are found to have either a paroxysmal EEG pattern, as seen in acquired epileptic aphasia, or electrical status epilepticus during sleep, as seen in some children with childhood disintegrative disorder (8). Any association between concomitant new onset of epilepsy and behavioral or functional regression is unknown, because there is usually a significant delay between the report of regression and the diagnosis of epilepsy (9). However, in children with a history of language regression, seizures were actually less frequent in children in the autism spectrum than in children with regression of language who did not meet criteria for autism (10). It has been suggested that the routine awake EEG frequently shows epileptiform abnormalities in adolescents and young adults with autism (11). Requesting EEG studies for children with autism only is not, however, routine practice. EEG is not recommended in the practice unless there is evidence of clinical seizures or regression or a high index of suspicion for epilepsy (12). There is considerable variability between pediatric neurologists, pediatricians, and psychiatrists with respect to referral for EEG. This retrospective study addressed the utility of routine EEG in the evaluation of children with PDDs, including diagnoses of pervasive developmental disorders—not otherwise specified, autism, and Asperger syndrome.

2. Material And Methods

This is a prospective study of 544 children with autism spectrum disorder presenting at "National Center of Child Welfare, Development and Rehabilitation" in Tirana over the period 2011-2013. A diagnosis of autism was made only in children who clearly met DSM-IV-TR dhe ICD-10 criteria for deficits in the areas of communication, social interaction, and repetitive behaviors. For all children the diagnosis was confirmed using the standardized instruments ADOS-G and ADI-R. Electroencephalograms of all was done while awake and asleep. Electroencephalograms were classified as: normal, abnormal but not epileptiform,

abnormal epileptiform with focal onset, and abnormal epileptiform with generalized onset. Epilepsy was diagnosed by a pediatric neurologist in children with more than one unprovoked seizure and/ or an epileptiform EEG.

3. Results And Discussion

The children were between 1 and 15 years old. 368 (67.6%) were boys and 176 (32.4%) girls. Epilepsy was diagnosed in 145 (26.7%) of children (fig. 1). Characteristics by epilepsy among children with autism spectrum disorder are shown in table 1. Among 145 children with epilepsy the majority of them (65%) were boys. The most frequent signs and symptoms were epileptiform focal seizures (22%), convulsion (20%), staring episodes (11%), febrile seizures (9%), medical history of regression (9%). Overall, the electroencephalogram was abnormal in 60 (11%) of children whereas 89% of the children had normal electroencephalograms (fig. 2). Abnormal electroencephalogram was found in 38 (26%) of children with epilepsy and in 20 (5%) of children without epilepsy. Among the abnormal electroencephalograms, 32% showed generalized spike activity, and 59% showed abnormal epileptiform activity with focal onset. Epilepsy occurred in 2% of young children with autism in this study, in a large sample of autistic children. This is in line with previous studies that report the association with epilepsy during childhood, adolescence and early adult life. Many of the cases of epilepsy in those studies had their onset in early adolescence (13,14). Thus, the indications are that the prevalence figure for epilepsy will rise considerably in our material in the next ten years. A variety of seizure types occurred, in this study. Infantile spasms were also fairly common and had affected 11% of the autistic children. According to other studies more than 10% of all children with infantile spasms also develop autism, and a greater number still develop autistic features. The question arises as to whether epilepsy causes autism or if autistic behavior and epilepsy are two aspects of some unifying underlying brain dysfunction. In some of the cases of autistic features in our study one could easily get the impression that the first alternative applies (5,16,17). Epilepsy should be suspected in children in the autism spectrum who have paroxysmal events. Review of home or school videos in addition to routine EEG may help in clarifying the diagnosis. Our results, which indicate that clinical suspicion for epilepsy should be high if there is a history of convulsion and staring episodes, are in agreement with other studies showing that nearly all autistic children with seizures also exhibit epileptiform activity on electroencephalograms (18,19). Regression of normal development was found to be another important clinical suspicion for epilepsy and is in accordance with other studies showing that autistic regression is significantly associated with the presence of epilepsy (13). Epilepsy often developed before the appearance of autistic symptoms in these cases. For most of the children, the reverse was almost always the case. From the limited evidence of this study we conclude tentatively that autistic behavior and epilepsy probably reflect underlying brain dysfunction and that there is no causal relationship between the two (20,21). Epilepsy in autism is often considered to be specifically associated with severe mental retardation, but this was not the case in our study.

The numbers are relatively small for general conclusions, but it is clear that epilepsy can occur in autism in the absence of mental retardation (22). These findings suggest that the use of neurological investigative techniques such as electroencephalography should be a consequence of careful clinical evaluation and should be considered routinely during evaluation of more impaired individuals. The association of autism with epilepsy and particularly has considerable theoretical interest. The epilepsy in children with autism should not be overlooked, and it should be routinely investigated.

4. Conclusion

Identification of children with increased risk for epilepsy has important implication for the prognosis and treatment of the disease. We hope that other researchers and clinicians in the field of autism will acknowledge this particular association with much more interest in the future. The treatment of children with the combination of autism and epilepsy poses extreme demands on the child, the family, and the physician. Only scientific study and clinical commitment will eventually ameliorate the sometimes deplorable state of the art evident today.

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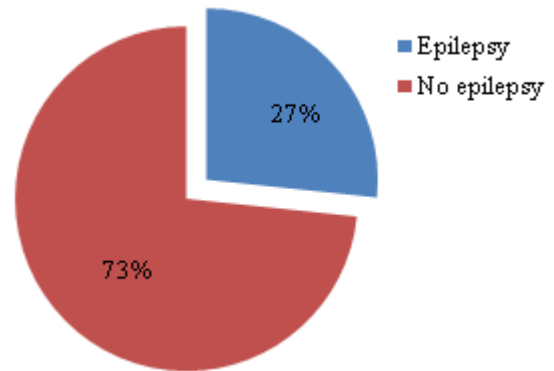


Figure 1: Frequency of epilepsy

Table 1: Characteristics by epilepsy among children with autism spectrum disorder

Variables	Total	No epilepsy (n=399)	Epilepsy (n=145)	p
Gender				0.4
Male	368	274 (74.5)	94 (25.5)	
Female	176	125 (71.0)	51 (29.0)	
Age (years)				<0.01
1-3	89	72 (80.9)	17 (19.1)	
4-6	104	76 (73.1)	28 (26.9)	
7-9	111	75 (67.6)	36 (32.4)	
10-12	123	82 (66.7)	41 (33.3)	
13-15	117	94 (80.3)	23 (19.7)	
Intellectual disability				
No	365	304 (83.3)	61 (16.7)	<0.01
Yes	179	95 (53.1)	84 (46.9)	

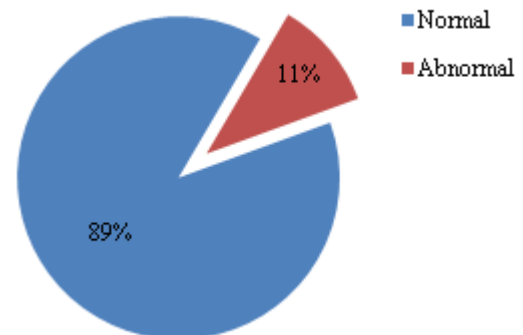


Figure 2: The result of electroencephalograms

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