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RESEARCH ARTICLE

Speech And Language Delay Or Disorder In Children Associated With Epilepsy

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Abstract: Speech and language disorders are common clinical features often associated with neurodevelopmental disorders. Abnormal brain activity associated with epilepsy can impact the developmental trajectory of cognitive processes, such as language. Early identification of children with speech and language delays and disorders will allow for early intervention before learning and behavioural problems develop to achieve better academic and social outcomes. This study evaluates whether children with epilepsy experience speech and language disorders. Observational analysis with a cross-sectional study with patient medical record data in the outpatient clinic of a pediatric neurology consultant from January 2023 to February 2025. Risk factors were analysed bivariate and multivariate. This study found that out of 479 children with epilepsy, 331 or 62.7% experienced speech and language delay or disorders. The study concludes that a significant proportion of children with epilepsy (62.7%) experience speech and language disorders. The presence of these disorders is notably associated with a higher frequency of seizures before treatment and the existence of comorbid conditions.

Keywords: speech and language, delay, disorder, epilepsy

INTRODUCTION

Speech and language disorders are common clinical features often associated with neurodevelopmental disorders.[1] Abnormal brain activity associated with epilepsy can impact the developmental trajectory of cognitive processes, such as language.[2] Early identification of children with speech and language delays and disorders will allow for early intervention before learning and behavioural problems

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develop to achieve better academic and social outcomes.

This study evaluates whether children with epilepsy experience speech and language disorders.

METHOD

Observational analysis with a cross-sectional study with patient medical record data in the outpatient clinic of a pediatric neurology consultant from January 2023 to February 2025. Risk factors were analysed bivariate and multivariate.

RESULT

This study found that out of 479 children with epilepsy, 331 or 62.7% experienced speech and language delay and disorder. Most of these epilepsy patients are patients who are referred from primary health facilities and hospitals with lower levels than the hospital where the study was conducted. Åsa Nordberga et al found that there were speech and language disorders in groups of children aged 5 to 12 years with new epilepsy, and these disorders occurred simultaneously with their epilepsy.[3]

Table 1. Characteristics of subjects with speech disorders in children with epilepsy

Characteristic	Total	Percentage
Gender		
- Male	300	62,6
- Female	179	37,4
Age		
- < 1 year old	40	8,4
- ≥ 1 Year old	439	91,6
Seizure Onset (year)		
- < 1 year old	63	13,3
- ≥ 1 year old	410	86,7
Total Seizures		
- < 10 Times	298	62,3
- ≥ 10 Times	180	37,7
Initial Response to Treatment	363	75,9
- Good	115	24,1
- Bad		
Eeg		
- Abnormal	370	77,1
- normal	109	22,7
Etiology		
- Genetic	258	53,8
- Structural	221	46,0
Comorbid		
- None	172	35,9
- Developmental Disorder	190	39,7
- Psychiatric Disorder	16	3,3
- Neurological Disorder	81	16,9
- Mixed	20	4,2
Speech and Language Delay and Disorder		
- No	178	37.2
- Delay and Disorder Present	331	62,8

Table 2. Factors that influence speech and language delay and disorders in children with epilepsy

	Delay and Disorder	No Delay and Disorder	*p*
Gender			
- Male	109	192	**0,28**
- Female	70	108	
Age			
- < 1 year old	19	21	**0,76**
- ≥ 1 Year old	227	212	
Seizure Onset (year)	249	46	**0,04**
- < 1 year old	161	17	
- ≥ 1 year old			
Total Seizures			
- < 10 Times	159	139	**0,000**
- ≥ 10 Times	141	39	
Initial Response to Treatment			
- Good	209	154	**0,000**
- Bad	91	24	
Eeg			
- Abnormal	234	136	**0,409**
- normal	67	42	

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Etiology			
-Genetic	184	117	**0,000**
-Structural	74	104	
Comorbid			
- None	88	84	
- Developmental	128	62	
Disorder	14	2	**0,001**
- Psychiatric	57	24	
Disorder	14	6	
- Neurological			
Disorder			
- Mixed			

DISCUSSION

James Whelles and colleagues' research have highlighted the relationship between epilepsy and language function, stemming from their shared neuroanatomical circuits. Their findings suggest that epilepsy can adversely affect language development, both directly and through associated intellectual disabilities that may hinder attention, an important factor in understanding how these neuroanatomical circuits interact. To further explore the connections between language, EEG abnormalities, and epilepsy, the application of magnetoencephalography (MEG) is recommended [10]

Research conducted by Parkinson found that children with focal seizures are 30% more likely to experience language disorders compared to those with generalised seizures.[5] Additionally, Yebeh discovered that children with speech and language dysfunction often exhibited focal epileptiform activity.[7] This study also revealed that children who experienced a higher number of seizures before receiving treatment had a significantly greater likelihood of having speech and language disorders or delays.

Research conducted by James Whelles indicates that children with language development disorders exhibit a higher incidence of seizures and demonstrate epileptiform activity on electroencephalograms (EEGs).[10] The findings of this study reveal that over 50% of children diagnosed with epilepsy also experience accompanying speech and language disorders. However, the study does not establish a definitive causal relationship between the occurrence of speech and language disorders and epilepsy; it remains unclear whether these disorders emerge concurrently with epilepsy or as a consequence of it. Furthermore, the analysis indicates no significant correlation between EEG abnormalities and speech and language disorders. Instead, the study identifies that the frequency of seizures before treatment and the presence of comorbid conditions are significantly associated with the observed disorders.

Melo's study demonstrated that preschool children diagnosed with epilepsy frequently exhibit delays in oral language development. The research identified male gender and the occurrence of partial seizures as key risk factors within this demographic.[2] The results were consistent with previous findings, revealing that a higher proportion of boys, as well as all children with epilepsy experiencing partial seizures, displayed significant impairments in speech and language development.

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There exists a significant imperative to enhance the early identification and treatment of epilepsy patients at risk of developing language and social skills disorders.[1] Prompt initiation of treatment is crucial, particularly for children with epilepsy who have a history of frequent seizures or concurrent comorbidities, to mitigate the risk of speech and language impairments.

There is disagreement in the literature as to whether seizures in epilepsy cause communication impairment or whether the occurrence of seizures and communication impairment are both epiphenomena of the underlying disorder. When epileptic seizures are in the form of subclinical status epilepticus, it has been suggested that the occurrence of seizures is the cause of communication impairment.[6] This study did not record whether status epilepticus occurred in the sample of patients with epilepsy. Moreover, it is not known whether speech and language impairments occurred with or after the onset of epilepsy.

According to Michael Seidenberg, "Almost every patient with epilepsy will develop a comorbid medical condition at some time during treatment." Proposed explanations for this association include the possibility that first, epilepsy (including its treatment) causes the comorbid condition; second, the comorbid condition (including its treatment) causes epilepsy; or third, a common pathogenic mechanism mediates the occurrence of epilepsy and the comorbid condition. It is unlikely that one explanation will be sufficient for all comorbid conditions in epilepsy. Determining the basis of the association between epilepsy and its comorbid conditions has important implications for diagnosis and management.[8] Thus, this study investigated whether the comorbid speech and language disorders in the study sample were due to the treatment or whether they were already present from the start or were a common pathogenic condition.

Comprehensive neuropsychological and speech pathology assessments should be part of the initial evaluation and ongoing monitoring of children with newly diagnosed epilepsy.[4] More than 50% of the study sample demonstrated speech and language disorders, which included delays, disorders, and a combination of both. Further research is necessary to determine whether these disorders in children with epilepsy result from the condition itself, the medications they are taking, or if these impairments were present from the beginning. Future studies are anticipated to focus on preventing speech and language disorders in children with epilepsy.

G Rejnö-Habte Selassie found that 6-year-old children with epilepsy without learning disabilities, cerebral palsy, or autism still had certain speech, language, and neuropsychological difficulties. However, verbal intelligence and comprehension were less affected. Children with early epilepsy and those who required more than one AED appeared to have more problems. Speech and language difficulties in children with epilepsy were higher in children with developmental language

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disorders.[9] This study found that there was a relationship between speech and language disorders in children with epilepsy and a higher number of seizures before treatment and comorbidities.

CONCLUSION

The study concludes that a significant proportion of children with epilepsy (62.7%) experience speech and language disorders. The presence of these disorders is notably associated with a higher frequency of seizures before treatment and the existence of comorbid conditions. While the study highlights important correlations, it does not establish a direct causal relationship between epilepsy and the emergence of speech and language disorders. Further research is necessary to clarify the nature of this relationship and to explore potential interventions.

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