

Avaliação do desempenho escolar e praxias em crianças com Epilepsia Rolândica*****

School performance and praxis assessment in children with Rolandic Epilepsy

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Abstract

Background: Rolandic Epilepsy is the most common form of childhood epilepsy. It is classified as idiopathic, age-related epileptic syndrome with benign evolution. The absence of neuropsychological impairment is part of the criteria of benignity of this epilepsy syndrome. Recently, however, several deficits related to attention and language have been suggested. Aim: to assess school performance and to investigate praxis problems in patients with rolandic epilepsy in comparison to a control group of normal children, paired by age, gender and educational level. Method: nineteen patients aged between 7 and 12 years underwent clinical neurological evaluation, psychological assessment, through the Weschsler Scales of Intelligence, and language evaluation, to assess the academic performance and to investigate the presence or absence of praxis difficulties. Result: the obtained data indicate that although intellectual efficiency (measured through the Intelligence Quotient - IQ) was within average, children with rolandic epilepsy presented a significantly poorer performance when compared to the control group in tests involving writing, arithmetic and reading. Another important aspect was the absence of orofacial apraxia in children with epilepsy. Conclusion: the results of the study suggest that the assessment of children with epilepsy is necessary to investigate specific deficits that require appropriate professional assistance. Regarding the presence of oral language and/or writing disorders in these children, academic, social and emotional deficits can be avoided. The prognosis of epileptic syndrome does not exclusively depend on the control of the crises, since social or cultural problems can interfere in life quality as much as the crisis.

Key Words: Epilepsy; Language; Children; Praxis.

Resumo

Tema: Epilepsia Rolândica é a forma mais freqüente de epilepsia da infância. Ela é classificada como idiopática, idade-dependente e de evolução benigna. A ausência de comprometimento neuropsicológico faz parte dos critérios de benignidade desta síndrome epiléptica. Entretanto, recentemente têm sido sugeridos vários déficits relacionados à atenção e linguagem. Objetivo: o objetivo desse trabalho foi avaliar o desempenho escolar e investigar dificuldades práxicas em pacientes com epilepsia rolândica e comparar a um grupo controle composto por crianças normais com idade, gênero e nível escolar equivalentes. Método: dezenove pacientes com idade entre 7 e 12 anos foram submetidos a avaliação neurológica clínica, avaliação psicológica, através das Escalas Weschsler de Inteligência e avaliação fonoaudiológica, onde foram avaliados o desempenho escolar e a investigação da presença ou não de dificuldades práxicas. Resultados: os dados mostraram que apesar da eficiência intelectual (medida pelo Quociente Inteligência - QI) estar dentro da média, crianças com epilepsia rolândica mostraram um desempenho significativamente mais pobre do que o grupo controle em provas de escrita, aritmética e leitura. Outro aspecto importante evidenciado foi a ausência de apraxia orofacial nas crianças do grupo afetado. Conclusão: deve ser ressaltado que a avaliação de crianças com epilepsia é necessária porque isso pode revelar distúrbios específicos que exigem ajuda profissional apropriada. Analisando a ocorrência de distúrbios de linguagem oral e/ou escrita nessas crianças, pode-se evitar um maior prejuízo acadêmico, social e emocional, afinal o prognóstico de uma síndrome epiléptica não depende exclusivamente do controle de crises, pois problemas sociais ou culturais podem interferir tanto quanto as crises na qualidade de vida dos pacientes.

Palavras-Chave: Epilepsia; Linguagem; Criança; Apraxia.

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Introduction

Many researchers have studied changes in the development of oral and written language in children with epilepsy. Epilepsy is defined not as a specific disease or single syndrome, but as a group of diseases that have as a common characteristic recurrent epileptic seizures in the absence of toxic-metabolic disorders or fever¹.

The excessive and abnormal synchronous electric discharges of nerve cells which cause epileptic seizures interfere in cognitive functions, behavior, consciousness and/or movement.²

Benign childhood epilepsies with centrottemporal rolandic paroxysmal discharges, which are the focus of this study, are classified as a partial epileptic syndrome (temporary dysfunction of a group of neurons in part of the brain) and idiopathic (a genetic predisposition without associated structural modification). Idiopathic partial epilepsies are very common in childhood, corresponding to 25% of all forms of epilepsy. They generally affect children between the ages of 3 and 13.

Because epileptic discharges in rolandic epilepsy involve the perisylvian region, the areas most likely to be affected are language and oral praxias³. This form of epilepsy generally has a benign course, with complete remission and no risk of neuropsychic sequelae, intellectual capacity being preserved. However, recent studies have shown that children may present some specific language-related problems that interfere with learning and/or alterations in oral praxis⁴.

The present study seeks to evaluate school performance and investigate praxis related difficulties in patients with benign rolandic epilepsy and compare it to a control group comprised of normal children of matching age, gender and schooling.

Method

The present study was submitted and approved by the UNICAMP Committee for Ethics in Research under the protocol 815/2007.

Nineteen patients with benign rolandic epilepsy age 7 to 12 were studied. They were all treated in the outpatient clinics for Childhood Epilepsy and Neuropsycholinguistics of the Department of Neurology at the UNICAMP Hospital.

The diagnosis of benign rolandic epilepsy was made on the basis of clinical examination and the electroencephalogram. Neuroimaging was performed to rule out brain lesions. All patients had normal neurological, ophthalmological and hearing exams and an intelligence quotient (IQ) equal to or above 80. Parents and/or legal guardians signed informed consent forms authorizing their child's or children's participation in the study.

The following patients were excluded from the study:

1. Those with speech and writing impairments as a result of the following (considering the criteria in the DSM-IV⁵): pervasive developmental disorders; cerebral palsy; acquired childhood aphasia; hearing impairments (including mild conductive hearing loss); and progressive diseases.
2. Those who did not sign the informed consent form.

The control group consisted of children without neurological diseases matched for sex, age and socio-educational level. The following were excluded from the group: relatives of children with benign rolandic epilepsy, children who had an IQ lower than 80, children on medications that act on the central nervous system, children who were not regularly attending school, children who had a history of neurological problems (such as meningitis, febrile seizures, head trauma with loss of consciousness), children with alterations in the MRI and children with altered neurological exams. Thus the control group was comprised of normal children from similar socio-cultural background to the patients whose parents accepted their inclusion in the study and who signed the informed consent form.

Patients underwent:

Clinical neurological assessment

The protocol from the Childhood Neurology course at the Department of Neurology at UNICAMP was used for the clinical neurological examination.

Psychological examination

The WECHSLER: WPPSI - WISC-III-WECHSLER Intelligence Scale for Children - 3rd edition for children over six⁶ was used to measure IQ.

Speech assessment

. History: interviews with parents or legal guardians were conducted to find out about: delays and/or alterations in language development; gestational history; conditions at birth; family history of speech delay; speech development and hearing; general cognitive development; development of learning skills; motor development; physical development; development of the estomatognathic system and social and environmental conditions;

. Speech test: the children who participated in the study were tested using specific tests to measure: praxis, reading and writing.

. Tests to examine phonoarticulatory organs for anatomical and/or functional alterations that could compromise the child's speech. Bucco-facial and articulatory praxis were tested using the Hage protocol⁷;

. EAT - Educational Achievement Test⁸ to assess school performance and its compatibility with chronological age in literate children.

Statistical analysis

The data collected was described and compared using the Chi-squared test, with the purpose of verifying possible differences between the groups. A significance level of 5% (0.050) was used for the statistical test. SPSS (Statistical Package for Social Sciences) version 17.0 was used to obtain the results.

Results

Table 1 describes the results of the praxis tests for both the study and the control group. There was no statistically significant difference between the groups.

Table 2 describes the general results from the Educational Achievement Test (EAT) for the study group and the control group. The statistical analysis showed a significant difference between the groups.

TABLE 1. Results of the praxis test.

GROUP	Praxis		Total
	altered	normal	
A	1 5.30%	18 94.70%	19 100.00%
C	0 0.00%	19 100.00%	19 100.00%
Total	1 2.60%	37 97.40%	38 100.00%

Abbreviations: A= study group; C= control group; p = 0.311

TABLE 2. Results from the Educational Achievement Test.

GROUP	EAT			Total
	Below average	Average	Above average	
A	14 73.70%	4 21.10%	1 5.30%	19 100.00%
C	0 0.00%	16 84.20%	3 15.80%	19 100.00%
Total	14 36.80%	20 52.60%	4 10.50%	38 100.00%

Abbreviations: A= study group; C= control group; EAT = Educational Achievement Test; p < 0.001.

Discussion

Given the study's objective of assessing school performance and praxis related abilities in patients with benign rolandic epilepsy and comparing it to a control group of normal children matched for age, sex and schooling, some relevant aspects will be now highlighted.

Orofacial or bucofacial apraxia, according to Ortiz⁹, is characterized by difficulty in performing isolated or sequential orofacial movements. The presence of dyspraxia or orofacial apraxia in children with benign rolandic epilepsy seems to indicate a dysfunction of cerebral regions involved in the planning and execution of non-linguistic complex movements, that is, the lower rolandic motor region¹⁰. Due to the location of the epileptic discharges in the centrottemporal regions, specific interferences with language and oral motor functions may occur.

There was no statistically significant difference between the groups. This can be explained by the fact that none of the children who participated in the study were taking medication and/or were being clinically controlled with antiepileptic drugs.

In regard to schooling, however, our findings show a statistically significant difference between the two groups that is consistent with most of the studies that investigate learning disabilities in children related to language^{3,11} attention and memory,¹¹ speech awareness¹² and school performance^{13, 14}.

It is known that the frequency of epilepsy is high at school age¹⁴ and many affected children end up not doing well in school.¹⁵

Piccirilli et al's studies¹⁶ suggest that children with benign rolandic epilepsy are at risk for learning difficulties. These findings also support the idea that focal paroxysm, although unrelated to an organic lesion, can interrupt cognitive function in a developing brain. This statement is consistent with studies¹⁷ which attributed learning disabilities in children with epilepsy to psychosocial

consequences of epilepsy or which classified them as side-effects of the antiepileptic medications administered to patients. Aldenkamp¹⁸ estimates that approximately 30% of children have learning disorders.

The specific results of the EAT subtests - writing, arithmetic and reading - also supported the statistical difference in the test's global result. In the three subtests there was a significant statistical difference between the group of children with epilepsy and the control group, reinforcing the notion that reading and writing disorders are the most expected co-morbidities of benign rolandic epilepsy since the clinical findings and EEG results are a reflection of a disorder in the perisylvian region.

According to recent studies those learning skills most affected in children with benign rolandic epilepsy, such as reading, writing and spelling, are also characteristic of dyslexia, which is the most common disturbance found in classrooms.

In 1986¹⁹ Dodrill stated that the early onset of epileptic seizures would have a determining role in compromising some mental abilities and would consequently affect school performance. This was indeed observed in the group we studied. The children who had their first seizure at an early age had worse performances when compared to those with later onset seizures.

The study of the relationship between epilepsy and cognitive dysfunction presents some methodological problems. In epileptic patients, countless factors can affect neuropsychological performance: age at onset of seizures, duration of the disorder, type, frequency, seriousness and the total number of seizures, damage to the subjacent brain structure and etiology, location of the electroencephalographic focus, and duration of treatment.²⁰ It is important to emphasize this since these results are part of a doctoral thesis that should be concluded in the first semester of 2011. All the factors cited above as capable of affecting the results were taken into consideration in this study and will continue to be considered in the thesis.

Conclusion

Few studies have examined the prevalence of speech and writing disorders in children with epilepsy. Such problems are frequently ignored. Caution is necessary in the interpretation of results of this study due to the small number of children included. However, our findings are consistent with the majority of other studies which show that children with benign rolandic epilepsy have difficulty with reading and writing, which in turn affects their school performance.

Children diagnosed with benign rolandic epilepsy need to be screened for reading and speech

impairments since those can have serious consequences reparable through intervention. Knowing that the average age for benign rolandic epilepsy is seven, and that the age in which reading skills are generally acquired is around five or six, children with benign rolandic epilepsy should be closely observed for difficulties in learning during this time.

Patients with benign rolandic epilepsy would benefit from a professional assessment conducted by a psychologist and a speech therapist at time of diagnosis.

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