Evaluation of seizure semiology, genetic, magnetic resonance imaging and electroencephalogram findings in children with Rett syndrome: A multicenter retrospective study

Nihal Yıldız[1], Esra Serdaroglu[2], Pınar Ozkan Kart[1], Seyda Besen[3], Seda Kanmaz[4], Dilara Ece Toprak[4], Betül Kılıç[5], Ozlem Ersoy[6], Pınar Gençpinar[7], Nihal Olgaç Dundar[7], Çetin Okuyaz[6], Ayşe Serdaroglu[2], Kurşat Bora Carman[8], Coşkun Yarar[8], Barıs Ekici[9], Burak Tatlı[9], Ilknur Erol[3], Kurşad Aydin[5], Hasan Tekgul[4] and Ali Cansu[1]

[1] Department of Pediatric Neurology, Karadeniz Technical University, Trabzon, Turkey, [2] Department of Pediatric Neurology, Gazi University, Ankara, Turkey, [3] Department of Pediatric Neurology, Baskent University, Adana, Turkey, [4] Department of Pediatric Neurology, Ege University, İzmir, Turkey, [5] Department of Pediatric Neurology, Medipol University, İstanbul, Turkey, [6] Department of Pediatric Neurology, Mersin University, Mersin, Turkey, [7] Department of Pediatric Neurology Katip Celebi University, İzmir, Turkey, [8] Department of Pediatric Neurology, Eskisehir Osmangazi University, Eskisehir, Turkey, [9] Department of Pediatric Neurology, İstanbul Pediatric Neurology Center, İstanbul, Turkey.

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INTRODUCTION

Rett syndrome (RTT) is an early-onset neurodevelopmental disorder and genetic mutations had been detected so far (1). Mutations in the X-linked gene methyl-CpG binding protein 2 (MECP2) are the most common cause but other genes such as FOXG1, CACNA1A, CDKL5 are also involved (2). RTT is primarily seen in females and epilepsy has been reported (3) .

OBJECTIVES

It was aimed to evaluate seizure semiology, electroencephalogram (EEG), magnetic resonance imaging (MRI), and genetic findings and treatment choices in Rett syndrome.

MATERIALS & METHODS

One hundred and twenty cases diagnosed with Rett syndrome with a genetic mutation between 2016-2022 were analyzed retrospectively by obtaining data from nine centers in Turkey. Evaluations include clinical status [typical (Partial or complete loss of acquired purposeful dexterity, partial or complete loss of acquired spoken language, gait abnormalities: impaired or lack of ability, stereotypical hand gestures such as shaking/squeezing, clapping/tapping, mouth opening, and washing/rubbing automatisms) vs atypical RTT] , genetic mutation types, seizure semiology, electroencephalogram (EEG) and magnetic resonance imaging (MRI) findings, and treatment of seizures.

RESULTS

There were 93.3% women. Typical RTT was found in 70% of the cases. MECP2 was shown to be 93.8%, FOXG1 2.7%, and CDKL5 1.8% in genetic etiology. Atypical RTT clinic was seen in 50% of the male studies. In atypical RTT cases, the first EEG was determined to be normal (p=0.01). On MRI, thinning of the corpus callosum and regression in myelination were found in CDKL5 and FOXG1 patients (p=0.009 and p=0.005, respectively). Treatments like vigabatrin, ACTH, and rufinamide were shown to be more commonly used in patients who have the same mutations (p=0.003, p=0.005 and p=0.003, respectively). In seizure semiology, the most common forms were generalized tonic-clonic and myoclonic epilepsy, while absence and focal epilepsy were less common. The most commonly used AEDs were valproate, levetiracetam, lamotrigine, and clobazam, which alter the severity and frequency of seizures (p=0.015, p=<0.001, p=0.022, and p=<0.001, respectively). There were no significant differences in EEG findings. Ketogenic diet and vagal nerve stimulation (VNS) increased cognitive improvement to 50% and steroid treatment to 60%. It was observed that seizures were greatly reduced after VNS application.

CONCLUSIONS

The results are similar to literature. Genetic testing should be performed more frequently in cases whom clinically suspected from RTT, so that more important information about the disease's course and outcomes can be discovered ahead of time. A study on genetic-phenotype corelation with subtype mutations could be more usefull for clinicians.

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CONTACT

Nihal YILDIZ
Karadeniz Technical Unıvercity Faculty of Medicine, Trabzon, Turkey
nihalyildiz661@gmail.com