MOLECULAR STUDY OF *SLC2A1* GENE IN DIFFERENT FORMS OF IDIOPATHIC GENERALIZED EPILEPSIES OF CHILDHOOD AND ADOLESCENCE

CAMILA VIEIRA SOLER[1]; MARINA COELHO GONSALES[1], MAIARA FERREIRA TERRA[1], MARIA AUGUSTA MONTENEGRO[1], MARILISA GUERREIRO[1], FERNANDO CENDES[1], ISCIA LOPES-CENDES[1]

[1]University of Campinas-UNICAMP, Campinas,SP, Brazil and the Brazilian Institute of Neuroscience and Neurotechnology-BRAINN.

Introduction

Several loci for different forms of idiopathic generalized epilepsies (IGE) have been found, but the number of identified genes is relatively small, because the correlation between genotype and phenotype is not complete. Furthermore, the prognostic value of the different mutations found in candidate genes, and correlation with clinical subtypes remain controversial. Recently, mutations in the *SLC2A1* gene were found in patients with Doose syndrome and subsequently described in other IGE as well. This gene encodes for the glucose transporter 1 (GLUT1), responsible for transporting glucose across the blood-brain, Deficiency of GLUT1 causes inadequate levels of cerebral glucose, and classical phenotype of GLUT1 deficiency is characterized by a serious metabolic encephalopathy with movement disorder, epilepsy and mental retardation, starting at about at one year of age.

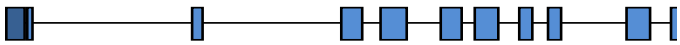

Figure 1. *SLC2A1 gene*.

Objective

The objective of this study is to characterize the molecular bases of different forms of generalized epilepsies of childhood and adolescence, by performing the screening of mutations in the candidate gene *SLC2A1*.

Method

We screened for mutations in *SLC2A1* gene in a total of 100 patients with epilepsy, 52 with juvenile myoclonic epilepsy (JME), 33 with other types of IGEs and 15 patients with Doose syndrome.

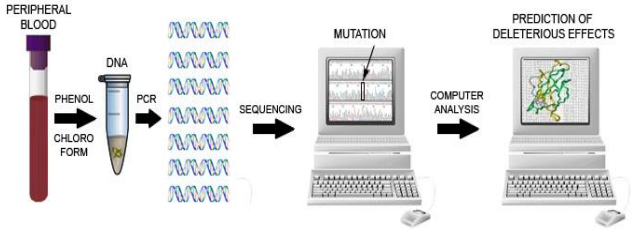

Figure 2. Methods.

Results

Silent nucleotide changes were found in 8 patients of our cohort, 7 of these have been already described in the literature (27 G> A, 45 C> T, 399 C> T, 588 G> A, 965 C> T, 1011 C> T, 1065 A > G) and one was a new change (1149 C> T) found in one patient with Doose syndrome. We also found one intronic insertion between exons 9, 10 (IVS9 CTCACCATTT 25), already described as a normal polymorphism in the population. No potential deleterious variations were found among our the patients testes.

Table 1. *SLC2A1* sequence variations found in patients with epilepsy

Exon	Nucleotide SNP variation	Patients with change		JME		IGEs		Doose	
2	27 G>A	**rs34025424**	41	22	42 %	12	38 %	7	47 %
	45 C>T	**rs1385129**	1	-	-	1	3%	-	-
4	399 C>T	**rs11537641**	21	17	32 %	-	-	4	27 %
5	588 G>A	**rs2229682**	25	10	19 %	11	34 %	4	27 %
7	965 C>T	**rs2229680**	9	5	9%	1	3%	3	20 %
8	1011 C>T	**rs2229681**	2	1	2%	1	3%	-	-
	1065 A>G	**rs2228490**	4	3	6%	-	-	1	7 %
9	1149 C>T	**new**	1	-	-	-	-	1	7 %
9-10	IVS9+25 CTCACC ATTT	**rs145043468**	59	32	60 %	20	63 %	7	47 %

JME: juvenile myoclonic epilepsy; IGE: Idiopathic generalized epilepsy; SNP: single nucleotide polymorphism

Conclusion

Since deleterious mutations were not found in *SLC2A1*, this gene does not seem to be related to IGEs or Doose Syndrome in our cohort.

Study supported by FAPESP (CEPID-BRAINN) and CNPq.