Interleukin-1Receptor Antagonist and Interleukin1- β - 511 Gene Polymorphisms Among Egyptian Children with Febrile Seizures

Background and Objectives:

Febrile seizures (FSs) are the most common form of childhood seizures. The higher levels of pro-inflammatory cytokines in children may induce seizures, and alternatively, higher levels of anti-inflammatory cytokines may act as a defense mechanism against seizures. We aimed to investigate whether IL-1β-511 C/T (pro-inflammatory cytokine) and IL-1 receptor antagonist (IL-1Ra) (an anti-inflammatory cytokine) gene polymorphisms could be used as markers for prediction of susceptibility to FSs.

Methods:

The current study included 22 patients with FSs and 22 healthy control subjects (HC). All patients were subjected to thorough history taking, full neurological examination, electroencephalography and peripheral blood sampling for genotype analyses. The gene polymorphisms were analyzed using restriction fragment length polymorphism analysis of the polymerase chain reaction products for IL-1β-511 C/T and a polymerase chain reaction for the IL-1Ra gene polymorphism.

Results:

The mean age of onset of FSs was 15.7 months. Eighteen (81.8%) cases had the criteria of complex FSs. Frequencies of alleles C and T for IL-1β-511 were 26/44 (59.09%) and 18/44 (40.91%) , respectively in FS patients, and 22/44 (50%) for both in the HC, there was a statistically significant difference between the two studied groups ($P < 0.001$). The CC genotype was statistically significantly more common in the FSs patients 8/22 (36.36%) than in the HC 2/22 (9.09%) ($P<0.05$). Genotype proportions and allele frequencies for IL-1Ra between groups were significantly different between FSs subjects compared to the HC. The IL-1 Ra-I homozygote was more frequent with statistically significantly different in patients with FSs 19/22 (86.36%) compared to HC 13/22 (50.09%) ($P<0.05$).

Conclusions

The IL-1Ra homozygous I/I and IL-1β-511 CC gene polymorphisms are associated with a higher susceptibility to FSs, which may be a useful marker for predicting the development of febrile seizures.

Key words:

Febrile seizures - interleukin-1 receptor antagonist - interleukin-1beta-511