Genetic susceptibility to Type 1 Diabetes in children: analysis of polymorphisms rs1990760 - IFIH1, rs20541 - IL13 , rs231775 - CTLA 4

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OBJECTIVES

To estimate the association of polymorphisms of IFIH1 (The interferon induced helicase domain 1), IL13 (The interleukin 13), CTLA 4 (Cytotoxic T-lymphocyte antigen 4) genes with the predisposition to T1DM in children.

METHODS

The study was performed in 194 patients with T1DM and 190 healthy volunteers. The three single nucleotide polymorphisms (SNPs): rs1990760 - IFIH1, rs20541- IL13 , rs231775- CTLA 4 were genotyped TaqMan SNP genotyping assay with platform QuanStudio 12K Flex - OpenArray plates using the real-time PCR.

RESULTS

Distribution of genotypes and alleles: rs1990760 – IFIH1 in T1DM and controls

Group	Genotype/Allele	All	
T1DM	T/T	83 (44%)	*p=0.001 OR=5*
	T/C	97 (51%)	
	C/C	9 (5%)	
	T	263 (70%)	*p=0.001 OR=2*
	C	115 (30%)	
Controls	T/T	54 (33%)	
	T/C	74 (47%)	
	C/C	31 (20%)	
	T	182 (57%)	
	C	136 (43%)	

Rs1990760 T alleles were more frequent in patients with T1DM in comparison to healthy subjects (p=0.001 with OR=5), 70% vs 57%

OR=2 means that risk for development of T1DM is 5 times higher for a T allele in comparison to a C allele.

Distribution of genotypes and alleles: rs20541 – IL13 in T1DM and controls

Group	Genotype/Allele	All	
T1DM	A/A	19 (11%)	
	A/G	69 (36%)	
	G/G	101 (53%)	
	A	107 (28%)	*p=0.004 OR=2*
	G	271(71%)	
Controls	A/A	7 (5%)	
	A/G	51 (32%)	
	G/G	100 (63%)	
	A	65 (20%)	
	G	251 (80%)	

Rs20541 A alleles were more frequent in T1DM patients in comparison to healthy subjects (p=0.04 with OR=2)

OR=2 means that risk for development of T1DM is 2 times higher for a A allele in comparison to a G allele.

Distribution of genotypes and alleles: rs231775 – CTLA4 in T1DM and controls

Group	Genotype/Allele	All	
T1DM	G/G	47 (25%)	
	G/A	99 (52%)	
	A/A	43(23%)	
	G	193 (51%)	*p=0.01 OR=2*
	A	185 (49%)	
Controls	G/G	27 (17%)	
	G/A	82 (51%)	
	A/A	51(32%)	
	G	68 (42%)	
	A	94 (58%)	

Rs231775 G alleles were more frequent in T1DM patients in comparison to healthy subjects (p=0.01, OR=2)

OR=2 means that risk for development of T1DM is 2 times higher for a G allele in comparison to a G allele.

CONCLUSIONS

- Rs1990760 T/C - IFIH1, rs20541 A/G - IL13 , rs231775 G/A – CTLA 4 polymorphisms could contribute to development of T1DM in children.
- The main risk factor for rs1990760 is T allele, for rs20541 A allele and for rs231775 G allele.