The Effect of SNPs and Interferon Therapy on *PSMC6* Gene Expression in Multiple Sclerosis Patients in Latvia

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Background

Multiple sclerosis (MS) is a neurodegenerative and autoimmune inflammatory disease that leads to various neurological disabilities [1]. Ubiquitin-proteasome system (UPS) is a key player in degradation of damaged and unnecessary proteins. Dysfunction of ubiquitin-proteasome system (UPS) causes accumulation of toxic protein aggregates in MS patients [2]. For treatment of MS, the first class of disease modifying therapies is interferon β (IFNβ). It interacts with the immune system: B cells, T cells, antigen-presenting cells, thus providing clinical efficiency for MS patients [3].

Aim

The aim of the current study was to evaluate SNPs of PSMC6 gene as possible biomarkers for multiple sclerosis in Latvian population.

Methods

Altogether 54 MS patients treated with IFNβ therapy and 44 MS patients without the treatment were enrolled in the study. RNA was isolated from blood and *PSMC*6 gene expression was analysed with qPCR. The *PSMA6* rs2295826 and rs2295827 were genotyped on MS subtype-, sex- and treatment efficiency association in 280 cases /305 controls study.

Kolmogorov-Smirnov (if N>50) or Shapiro-Wilk (if N<50) tests were used to test the normality. Comparisons between groups were done with Mann Whitney U test for two groups or Kruskal-Wallis test for more than two groups. Association with genotyping results was calculated using eta (η).

Results

In the group of MS patients treated with IFNβ, patients with AA/CC genotype showed statistically significantly higher *PSMC6* gene expression compared to patients with AG/CT+GG/TT genotypes. When all of the groups were analysed together (according to genotypes and treatment), the results showed statistically significant differences among the groups (Fig. 1).

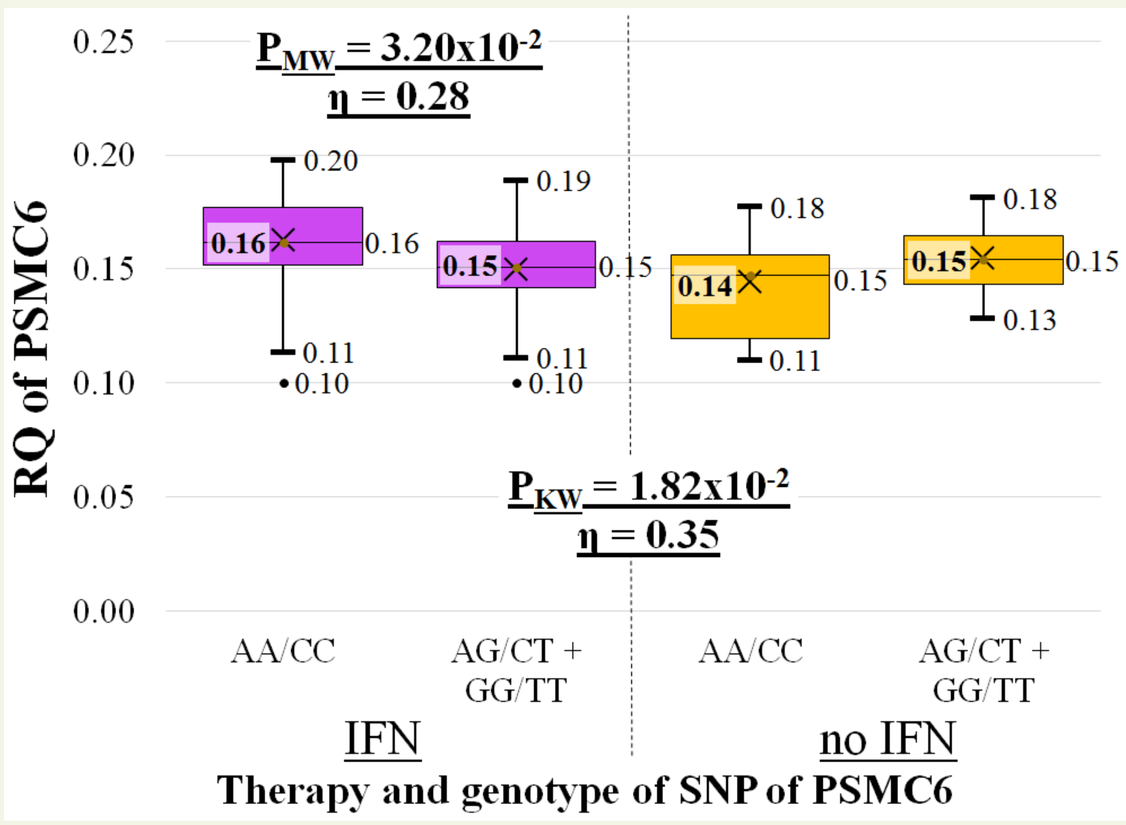

Figure 1. **Expression levels of *PSMC6* gene in multiple sclerosis (MS) patients.** IFN – group of MS patients with interferon β treatment; no IFN – group of MS patients without the treatment. AA/CC – common genotype; AG/CT+GG/TT – rare alleles and heterozygous genotypes.

Conclusions

The results indicate that both the treatment with IFNβ and genotypes of patients affect the expression of *PSMC6* gene.

References

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