PSMA6 Gene Expression Level in Multiple Sclerosis Patients and Control Individuals

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Background

Multiple sclerosis (MS) is an autoimmune inflammatory disease of the central nervous system (brain, spinal cord and optic nerves). Inflammation damages myelin, which surrounds and insulates the nerve fibres, the nerve fibres themselves, and the specialized cells that make myelin, thus leading to neurodegeneration and disabilities [1]. Ubiquitin-proteasome system (UPS) is crucial in the regulation of the immune system; therefore, it might play a role in the development and progression of MS. Furthermore, proteasomes were shown to be major autoantigens in case of MS [2]. Genetic variations of proteasomal genes might be involved in modulation of UPS efficiency. Susceptibility to autoimmune diseases, cardio-vascular disorders and type 2 diabetes mellitus is associated with polymorphisms in the 14q11-24 proteasomal genes [3]. They could be also involved in the pathogenesis of MS. [4]

Aim

The aim of the current study was to investigate an association between *PSMA6* gene expression level and rs1048990 genetic variations in MS patient's groups.

Methods

Altogether 127 MS patients and 17 control individuals were enrolled in the study. RNA was isolated from blood and *PSMA6* gene expression was analysed with qPCR. The *PSMA6* rs1048990 was genotyped on MS subtype-, sex- and treatment efficiency association in 280 cases /305 controls study.

Results

PSMA6 gene expression was increased in MS patients compared to controls ($p=3.1x10^{-2}$) (Fig.1). For rs1048990 rare alleles and heterozygous genotypes *PSMA6* gene expression level was lower compared to genotypes homozygous on common alleles ($p=6.4x10^{-3}$). When patients were stratified on groups by sex; for women we could see the same trend with increased expression of the gene in individuals with genotypes carrying common alleles ($p=1.9x10^{-2}$), but for males the difference did not reach statistical significance.

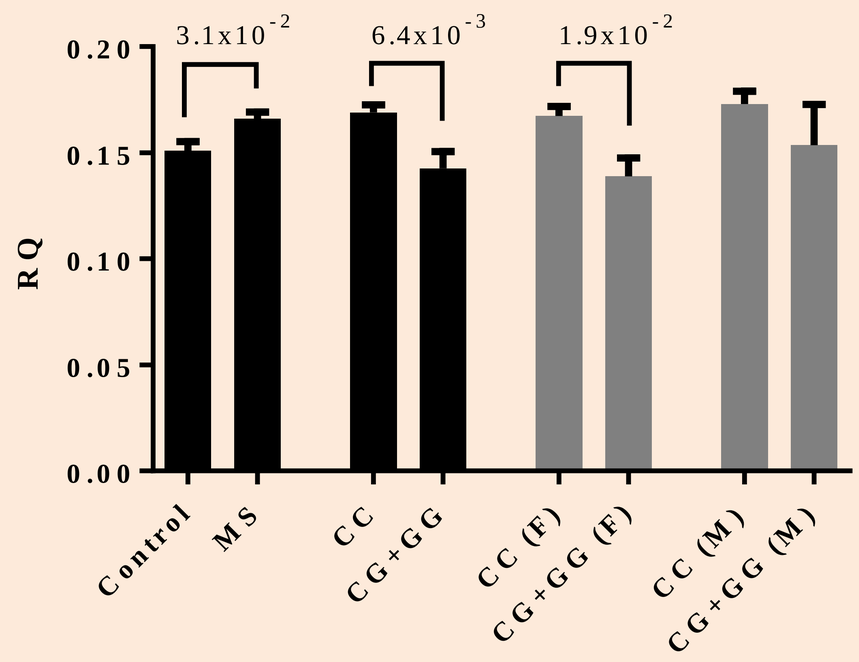

Figure 1. ***PSMA6* gene expression (rs1048990)**. MS – multiple sclerosis; CC – common genotype; CG+GG – rare alleles and heterozygous genotypes; F – female; M – male.

Conclusion

Our results suggest susceptibility of the *PSMA6* gene rs1048990 genetic variations to multiple sclerosis in Latvians.

References

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