Changes in mRNA expression of thioredoxin and thioredoxin reductase genes in patients with multiple sclerosis

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Introduction: Thioredoxin-1 (Trx1), thioredoxin reducates-1 (Txnrd1) and NADPH are one of the main regulators of redox system, and play a pivotal role in many intracellular functions. Herein, we aimed to investigate mRNA expression levels of TRX1 and TXNRD1 genes in patients with multiple sclerosis (MS).

Methods: a total of 9 patients taking interferon-beta (IFNβ), 11 patients without medication, and also 11 healthy subjects (control) were entered into the study. Total RNA content was extracted from blood leukocytes and cDNA synthesis was performed using special RNA extraction and reverse transcription PCR kits. Then, mRNA copy numbers of TRX1 and TXNRD1 genes were measured by quantitative SYBR Green real-time PCR assay.

Results: A significant decrease was observed in mRNA expression of TXNRD1 in none-medication patients compared to the healthy controls (P= 0.026), while, there was no significant difference in expression of TXNRD1 between IFNβ and control groups (P= 0.632), and also between none-medication and IFNβ groups (P= 0.091). Although, expression of TRX1 in both none-medication and IFNβ groups was higher than control group, these changes were not statistically significant (P= 0.561 and P= 0.198, respectively). Also, TRX1 expression was not significantly different between none-medication and IFNβ groups (P= 0.437).

Conclusion: It seems that expression of TRX1 and TXNRD1 genes in MS patients is changed at mRNA levels, which might be implicated in pathobiology of the disease. However, further investigations are still of great essential to approve this hypothesis.

Keywords: Expression, Multiple sclerosis, Redox system, Thioredoxin, Thioredoxin reductase