

Vascular Endothelial Growth Factor-A mRNA gene Expression in Clinical Phases of Multiple Sclerosis

Background and Objectives:

Vascular endothelial growth factor A (VEGF-A) stimulates angiogenesis, but is also pro-inflammatory and plays an important role in the development of neurological disease. VEGF-A has protective effects on the nerves that have been associated with neurodegenerative diseases. Accumulating evidence supports a role for VEGF in the pathogenesis of multiple sclerosis (MS). Most patients in MS who suffer from relapsing remitting multiple sclerosis (RRMS) develop secondary progressive MS (SPMS), characterized by an increase of nervous deficit. Mechanisms that lead to the transition are unknown and we are lacking therapies or effective biomarkers.

This study aimed to investigate whether VEGF-A mRNA expression in whole blood could be used as a marker for prediction of susceptibility to multiple MS and relate VEGF to the clinical phases of MS. We also investigated a possible role for VEGF-A during transition from RRMS to SPMS. In addition, we analyzed the correlation between VEGF mRNA gene expression changes and brain magnetic resonance imaging (MRI) findings, age, multiple sclerosis progression index, expanded disability status scale and disease duration.

Methods:

A total of 60 MS subjects compared to 20 healthy controls (HC). Subjects were subjected to history taking, neurological examination, MRI & peripheral blood sampling for VEGF-A mRNA gene expression. VEGF-A gene expression was measured by real-time polymerase chain reaction (RT-PCR) using SYBR Green technique using glyceraldehyde-3-phosphate dehydrogenase (GAPDH) as a housekeeping gene.

Results:

VEGF-A mRNA gene expression level was significantly lower in the MS group compared to the HC ($P < 0.001$). VEGF-A mRNA gene expression level was higher in RRMS patients in relapse compared to those in remission ($P < 0.001$)

and in RRMS compared to SPMS ($P < .001$). There was a positive correlation between VEGF-A gene expression levels and each of: age and duration of disease. Meanwhile there was no correlation between VEGF mRNA gene expression level and multiple sclerosis progression index & expanded disability status scale.

Conclusions:

A lower VEGF-A mRNA gene expression level was independently associated with a higher risk of MS. VEGF mRNA gene expression level was higher in RRMS in relapse compared to those in remission. In addition, VEGF-A mRNA expression level can distinguish RRMS from SPMS subjects.

Key words:

VEGF-A mRNA gene expression - multiple sclerosis