Nailfold capillaroscopic examination and endothelial nitric oxide synthase (eNOS) Glu298Asp polymorphism (G894T) in normal tension glaucoma patients – a pilot study

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In the absence of an elevation in intraocular pressure, vascular risk factors have been postulated to play a role in normal tension glaucoma (NTG). Vasospastic disorders such as migraine and a Raynaud’s-like peripheral circulation are more prevalent in patients with NTG.

The vascular endothelium plays a vital role in the control of blood flow. In addition to mediating the effects of many hormones and vasoactive agents, it releases factors itself that may act either to contract the vascular smooth muscle, such as endothelin-1, or to relax it, such as nitric oxide (NO), the most potent endothelial vasodilator. It is synthesized in the vascular endothelium by the enzyme, endothelial nitric oxide synthase (eNOS)

Polymorphism of G894T eNOS gene changes the enzyme structure by replacing in the amino acid. Mutation in eNOS gene has been implicated in different vasospastic diseases.

Objectives

The purpose of this study was assessment of nailfold capillary changes and their possible relation to polymorphism of a gene encoding endothelial nitric oxide synthase (eNOS) in NTG patients.

Method

The study included 35 normal-tension glaucoma (NTG) patients (23 female and 12 male). Capillaroscopic examination of the nailfold capillaries of II to V
fingers of both hands was performed (before and after the cold provocation test) by means of a videocapillaroscope. SNP Glu298Asp in 7th exon was determined by allele specific polymerase chain reaction followed by restriction fragment length polymorphism analysis.

**Results**

31 (88.6%) patients suffered from cold extremities. In 24 (68.5%) patients nailfold capillaroscopy was within normal limits, in 11 (31.5%) patients the results were abnormal, 4 (11.4%) of them mimicked changes observed in scleroderma. The cold provocation test was positive in 43.5% of NTG patients. The patients with NTG presented the following nailfold capillaries: megacapilaries or dilatated capillaries (44.4%), ramified/bushy (18.9%), coiled (17.1%).

Assessing the Glu298Asp polymorphism of eNOS gene in NTG patients, GG genotype was present in 15% patients, GT in 71.4 % and TT in 9.5%. There were no correlation between SNP variants and capillaroscopy results nor cold provocation test ( p=0.95 and 0.32, respectively).

**Conclusions**

Capillaroscopy can be a useful accessory examination especially in NTG patients with vasospastic disorders. The Glu298Asp polymorphism of eNOS gene does not influence the capillaroscopy results. The high incidence of sclerodermia - like changes in capillaroscopy in NTG needs further studies.