Glaucomatous type abnormalities in patients with systemic sclerosis

Sirs,

Systemic sclerosis (SSc) is a chronic autoimmune disease, which is characterized by functional and structural abnormalities of blood vesels, fibrosis of the skin and major organ involvement (1, 2). Few studies in the literature refer to the types of ocular involvement and possible causes (3-5).

This study evaluates the distribution of ocular involvement in patients with SSc, performing complete ophthalmologic examination, with special examination regarding glaucomatous abnormalities in order to investigate possible glaucoma traits. Glaucoma is characterized by a progressive thinning of the neuroretinal rim which reflects loss of nerve fibers.

Forty patients (78 eyes), aged 54.0 ± 14.0 years fullfilling the American College of Rheumatology and Leroy's classification criteria were included (6, 7). Thirty-eight volunteers (76 eyes) matched for age and sex were examined. Patients suffering from diseases other than SSc and patients with history of ocular hyperension, angle abnormalities, pseudoexfoliation or cataract were excluded. Eye examination included visual acuity evaluation, slit-lamp biomicroscopy, gonioscopy, tonometry with the Goldmann applanation tonometer and indirect ophthalmoscopy. Morning measures of intraocular pressure (IOP) were taken. In addition, visual field evaluation with automated static perimetry (Humphry Field Analyzer, Central 24-2 threshold test). Mean deviation (MD) and pattern standard deviation (PSD) were the parameters of the test assessed in our study. A visual field MD of <-2 decibels (dB) was considered significant. A loss of fixation > 2 and false negative responses > 20% or false positive responses > 20% rendered a test non accurate and was excluded from the study. The optic nerve head was photographed using digital stereo-camera method in order to examine excavation and rim thinning. Circumferential cup/disc ratio greater 0.3 (the mean value found in the general population) and greater than 0.7 (a typical glaucomatous optic nerve head excavation) were evaluated.

Clinical features of SSc patients are depicted in Table I. Two SSc patients had lost one eye each. The first because of a traumatic event during childhood and the second due to herpes zoster infection before SSc development. Statistical analysis was performed using Mann-Whitney's test for comparisons and crosstabulation test for correlations in the SPSS v.12.

Table I. Clinical and laboratory characteristics of 40 systemic sclerosis patients.

Variables	Patients	%
Limited SSc	28	70.0
Diffuse SSc	12	30.0
Sclerodactyly	40	100.0
Digital ulceration	20	50.0
Raynaud's phenomenon	36	90.0
Esophageal involvement	28	70.0
Pulmonary involvement	11	27.5
Renal involvement	1	2.5
Antinuclear antibodies	37	92.5
Anti-Topoisomerase I	13	47.5
Anti-centromere	10	25.0
Treatment		
D-Penicillamine	8	20.0
Methotrexate	21	25.5
Azathioprine	10	25.0
Nifedipine	35	87.5
Aspirine (100 mg)	32	80.0

The visual acuity was similar in both groups. IOP did not show statistically significant differences and was under 21 mmHg in both groups. Cup/disc ratio > 0.3 was found in 33/78 eyes of patients and 16/76 eyes of control group ($p < 0.001$). Cup/disc > 0.7 was found in 1 eye of patient with SSc and in none of the control group. Visual field defects (MD <-2 dB) were observed in 53/78 eyes of patients and in 6/76 eyes of control group ($p < 0.001$). A significant difference was determined between values of PSD in visual fields of eyes of patients (3.1 ± 1.95 dB) and those of control group (1.57 ± 0.38 dB) ($p < 0.001$). Combination of cup/disc > 0.3 and visual field defects (MD <-2) was found in 20/78 eyes of patients and in 1/76 eyes of control group ($p < 0.001$).

Capillary defects have been described in SSc patients (8). Raynaud phenomenon is one of the most important initial sign of SSc, proves that capillary alteration is one of the initial changes in SSc. Several studies have reported a relationship between the above vascular abnormalities and transient ischemia in the optic nerve head. This phenomenon recently has gained ground in the pathogenesis of normal tension glaucoma (NTG) (9, 10).

Our results showed high incidence of such abnormalities at the optic nerve head of the eyes examined, and are in agreement with those of Allanore *et al*. (5). However these did not reflect severe, established cases of glaucoma. Visual acuity was almost normal in all cases, IOP was lower than 21 mmHg in all cases and several signs might have been missed in a regular ophthalmic examination. This is due in part to the fact that all patients examined were referred for examination and did not seek ophthalmiatric examination on their own. This means that the abnormalities discovered may be at the early stage, not yet causing symptoms.

We may conclude that patients with SSc develop ocular abnormalities suggesting initial stage of glaucoma. The mechanism seems similar to the pathogenesis of NTG. A systematic ophthalmological evaluation of such patients, may be important in discovering early damage to the optic nerve head and preventing the development of severe damage.

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