

and fungi were negative. These findings suggest that apoptosis occurs in choroidal granuloma and plays a regulatory role in limiting ocular inflammation.⁴

Upon diagnosis of ocular sarcoidosis and treatment with azathioprine, the patient's vision improved to 20/40 in her right eye and has remained stable for 4 years.

COMMENT

This case illustrates several points: ocular sarcoidosis can occur in the absence of pulmonary signs or symptoms and causes a plethora of ocular findings; the disease eludes accurate diagnosis—in this case, a chorioretinal biopsy excluded chronic infection and led to accurate diagnosis⁵; and ocular sarcoidosis can resist corticosteroid therapy. This patient's disease progressed despite treatment with periocular and systemic corticosteroids and cyclosporine, but responded to azathioprine. Azathioprine has been used successfully to treat sight threatening ocular sarcoidosis at 1–1.25 mg/kg/day.⁶ Although sarcoidosis responds to corticosteroids, other immunosuppressive agents may be needed to control ocular disease.

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Relation between blood flow velocities in the ophthalmic artery and in nailfold capillaries

EDITOR,—Studies on visual field and peripheral circulation had led to the hypothesis that the eye might be involved in the vasospastic syndrome,¹ a potential contributor to glauco-

matous optic neuropathy.² In some patients with peripheral vasospasms, visual field defects worsened after cold provocation, and, often, both peripheral vasospasms and visual field defects improved after calcium channel blocker treatment.¹ Because these and newer observations³ suggest some parallels in ocular and digital blood flow regulation, the relation between ophthalmic artery and nailfold capillary blood flow velocities was evaluated.

Fifty patients with primary open angle glaucoma with a mean age of 67 (SD 15) years were examined. Excluded were patients with previous filtering surgery or systemic and cardiovascular diseases. Blood flow velocity in nailfold capillaries was assessed in one randomly chosen finger of the right hand (totally arbitrary choice) by means of nailfold capillaroscopy.⁴ The velocities measured in each visible vessel were averaged. Blood flow velocity in the ophthalmic arteries was assessed by means of colour Doppler imaging (CDI). The ophthalmic artery was traced nasal to the optic nerve, 10–15 mm posterior to the globe. CDI measurements of the right eye of each patient were considered for further analysis (same side as nailfold capillaroscopy). Peak systolic velocity (PSV), end diastolic velocity (EDV), mean velocity (MV), and resistivity index (RI) ($RI = (PSV - EDV)/PSV$) were computed. Linear correlations between blood cell velocity in nailfold capillaries and ophthalmic artery were assessed (Spearman's rank order correlation factor).⁵

The mean blood cell velocity in nailfold capillaries was 0.45 (SD 0.32) mm/s. The mean PSV was 37.11 (7.33) cm/s. The mean EDV was 7.7 (3.06) cm/s. The average MV was 15.30 (7.80) cm/s. The mean RI was 0.79 (0.07). EDV ($R=0.31$; $p=0.034$) and MV ($R=0.38$; $p=0.007$) correlated with blood cell velocity in nailfold capillaries. PSV ($R=0.14$; $p=0.35$) and RI (-0.25 ; $p=0.09$) did not correlate with nailfold capillary blood cell velocity. Systemic blood pressure (mean systolic blood pressure 120.5 (11.4) mm Hg; mean diastolic blood pressure 73.4 (13.6) mm Hg) did not vary significantly during blood flow assessments.

COMMENT

The results suggest a relation between nailfold capillary blood cell velocity and blood flow velocity in the ophthalmic artery. Although the ophthalmic artery is the only routinely assessed retrobulbar vessel in CDI which does not enter the eye, its contribution to choroidal blood flow is important.⁶ Because vasospastic dysregulation seems to be much more common in the ciliary circulation than in the retinal vasculature,² it appeared reasonable to evaluate this vessel, especially because this

vessel is assessed much more reliably than ciliary vessels during CDI.⁷ RI and PSV did not correlate with nailfold capillary blood cell velocity. However, RI is not a measure of velocity. PSV represents a unique event in arterial blood flow, and, possibly, capillary blood flow fluctuations may not be related directly to very brief moments during the cardiac cycle.⁸ Although the measurement of EDV is less reproducible compared with PSV and RI,⁷ a fact which is expected to alter a potential correlation, nailfold capillary blood cell velocity correlated with EDV and MV in the ophthalmic artery. The relatively constant blood flow during the diastole might predict more closely blood cell velocity in the capillary bed. Mean velocity is not related to unique moments in the cardiac cycle and seems to reflect even more closely blood cell velocity in capillary vessels. Although the present study suggests some common alterations in various vascular beds in glaucoma patients, special caution is warranted. Dysregulative phenomena might well alter various vascular beds in a comparable fashion, but local factors will always influence regional blood flow. Consequently, further studies will have to confirm these results and unravel the exact basis for such a relation.

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