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DEMYELINATING DISORDERS

OCULAR PATHOLOGY IN MULTIPLE SCLEROSIS

Graded, histological evaluations on eyes from 82 patients with multiple sclerosis (MS) and 10 subjects with other neurological diseases, with immunohistochemistry on a subset, were performed and correlated with clinical and pathological findings in a study at University of California San Francisco, and Queen's University and Health Trust, Belfast, N Ireland, UK. Ages of subjects ranged from 21 to 87 years; 76 had chronic MS (mean duration 23 +/- 13 years) and 6 had acute MS (mean duration 4 +/- 3 months). In 121 eyes from chronic cases, 13% of retinae showed periphlebitis and 80%, cell loss; 72% of optic nerves showed gliosis and 71%, atrophy; and 72% showed iris reaction. Except for retina periphlebitis, all other abnormalities were significantly more frequent in MS cases than in those with other neurological diseases, controlling for age and gender ($P<0.001$). Severity of retinal atrophy was correlated with overall brain weight ($P=0.04$). Atrophic changes were seen in the retinal nerve fiber layer, ganglion cell layer, and also in the inner nuclear layer, suggesting widespread damage. Prominent gliosis and inflammation surrounding vessels of the inner retina could impact reliability of optical coherence tomography evaluations. The injury to both iris and retina were seen at all stages of disease. The odds of finding retinal atrophy in subjects with MS was >17 times greater than in non-MS subjects. (Green AJ, McQuaid A, Hauser SL, Allen IV, Lyness R. Ocular pathology in multiple sclerosis: retinal atrophy and inflammation irrespective of disease duration. **Brain** June 2010;133:1591-1601). (Ari J Green, 350 Parnassus Ave, Suite 908, San Francisco, CA 94117. E-mail: agreen@ucsf.edu).

COMMENT. Retinal pathology and sheathing of retinal veins in MS were described by Rucker CW at the Mayo Clinic in 1944 and reviewed by him in 1972 (**Mayo Clin Proc** 1944;19:176-178; 1972;47:335-340). Rucker's expertise in neuro-

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ophthalmology sometimes diagnosed MS in unsuspected cases. Detailed examination of the retina may be under-utilized in clinical neurology. This description of ocular pathology at all disease stages in a large adult case series supports the utility of tracking MS disease progression by retinal examination and imaging in patients of all ages.

GENE- VITAMIN D INTERACTION AND MULTIPLE SCLEROSIS

Evidence for a role of vitamin D and direct gene-environmental interaction in the cause of multiple sclerosis (MS) is reviewed by researchers at John Radcliffe Hospital, Oxford, UK. Factors known to affect the prevalence of MS include geographical and correlation with latitude, exposure to sunlight, vitamin D intake and serum levels of 25-hydroxyvitamin D, the modifications of vitamin D levels related to pregnancy, maternal diabetes and obesity, and the regulation by vitamin D of the main MS-associated HLA-DRB*1510 allele. A study in twins with MS finds that vitamin D levels are regulated by genetic variation in the 1-hydroxylase and vitamin D receptor genes, emphasizing the importance of gene-environmental interaction and vitamin D in the cause of MS. The evidence is largely circumstantial but sufficiently strong to support trials of vitamin D supplementation tailored to risk factors and genetic profile. (Handunnetthi L, Ramagopalan SV, Ebers GC. Multiple sclerosis, vitamin D, and *HLA-DRB1*15*. **Neurology** 2010;74:1905-1910), (Respond and Reprints: Professor George C Ebers, University Department of Clinical Neurology, Level 3, West Wing, John Radcliffe Hospital, Oxford OX3 9DU, UK. E-mail: george.ebers@clneuro.ox.ac.uk).

COMMENT. In an editorial, Wingerchuk DM (**Neurology** June 2010;74:1846-1847) discusses the potential preventative and therapeutic benefits of vitamin D supplementation in MS. He reviews results of a year-long phase I/II open-label, randomized, controlled, dose-escalation study of vitamin D supplementation in 49 patients with MS (90% with relapsing remitting disease).(Burton JM et al. **Neurology** 2010;74:1852-1859) With a maximum target dose of 40,000 IU daily by weeks 23-29, 10,000 IU daily from weeks 29-41, and finally 4,000 IU daily to end of study, vitamin D therapy resulted in sustained supraphysiological serum levels of 25-hydroxyvitamin D without adverse effects on calcium metabolism or evidence of nephrolithiasis. Clinical outcomes suggested a trend toward reduced relapse rate of MS and less disability progression in the vitamin D treatment group. Further controlled studies are required to establish the optimal dose of vitamin D in supplementation trials.

The June issue of **Ped Neur Briefs** includes reference to a report of low vitamin D levels associated with an increased relapse rate in pediatric-onset MS. (Mowry EM et al. **Ann Neurol** May 2010;67:618-624). Relapse rate of MS in pediatric-onset is significantly higher than that in adult-onset cases (Gorman MP et al. **Arch Neurol** 2009;66:54-59).

Low 25 hydroxyviramin D levels prevalent in black adolescents living in sunny southeastern US in all seasons are related to adiposity and poor physical activity and fitness. (Dong Y et al. **Pediatrics** June 2010;125:1104-1111).