Ocular Manifestations of the Antiphospholipid Syndrome

Essay

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List of Abbreviations

Abbreviation	Meaning
aCL	Anticardiolipin antibodies
ADP	Adenosine diphosphate
AION	Anterior ischemic optic neuropathy
APC	Activated protein C
aPLs	Anti-phospholipid antibodies
APS	Antiphospholipid syndrome
ARON	Acute retrobulbar optic neuritis
aVEGF	Antivacular endothelial growth factor
BUT	Breakup time test
β2GPI	Beta2-glycoprotien I
CME	Cystoid macular edema
CNS	Central nervous system
CRAO	Central retinal artery occlusion
DLE	Discoid lupus erythematosus
EFVM	Epiretinal fibrovascular membranes
ELISA	Enzyme-linked immunosorbent assay
FA	Fluorescein angiography
GP	Glycoprotein
IgG	Immunoglobulin G
INR	International normalized ratio
KCS	Keratoconjunctivitis sicca
LAC	Lupus anticoagulant
MHC	Major histocompatibility complex
MRI	Magnatic resonance imaging
NAION	Non-arterial ischemic optic neuropathy
NED	Neuroepithelial detachment

Abbreviation	Meaning
OCT	Optical coherence tomography
PE	Phosphatidyl ethanol amines
PL	Phospholipid
POA	Progressive optic atrophy
PS	Phosphatidyl serine
RPE	Retinal pigment epithelium
SLE	Systemic lupus erythematosus
TFPI	Tissue factor pathway inhibitor
TRD	Tractional retinal detachment
TXA_2	Thromboxane A_2

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Introduction

The antiphospholipid syndrome (APS) is an auto immune-mediated disease currently considered as the most common acquired cause of hypercoagulability in the general population ***(Locksin et al., 2000).***

Since its description, the original APS definition of association of vascular thrombosis and thrombocytopenia in the presence of the antiphospholipid antibodies (aPLs) has been expanded to the involvement of other cells, tissues, organs and systems ***(Bertolaccini et al., 2005).***

The eye is affected in important number of patients with APS, either if it is primary or associated to systemic lupus erythematosus (SLE) or other autoimmune diseases. The ocular APS prevalence and the epidemiological features, treatments and follow-ups vary between the different studies ***(Sivaprasad et al., 2007; Trojat et al., 2005).***

The eye involvement in the APS is particularly frequent and includes a number of anterior and/or posterior segment lesions. There is a high prevalence of transient visual mono- or binocular disturbances related to autoimmune-mediated inflammatory responses and ischemia ***(Montehermoso et al., 2002).***

The posterior ocular pole is usually the most affected and the one with more severe functional damage. Particularly, the

advanced chorio-retinal and optic nerve involvement is associated with central nervous system (CNS) involvement and may have important visual and vital prognostic implications ***(Behbehani et al., 2004).***

Some of the visual disturbances can be the first manifestation of the APS and may be risk factors for severe ocular, cerebral or systemic vascular ischemic, hemorrhagic or occlusive events ***(Coroi et al., 2007).***

APS patients frequently complain of visual symptoms, mainly binocular and transient in nature. In case of binocular, they are associated with CNS or systemic vascular involvement; whereas in monocular, they are associated with unilateral ocular ischemic or inflammatory lesions ***(Gelfand et al., 1999).***

The ocular symptoms reflect anterior and posterior pole involvement and include; dry eye sensation, transient blurred vision, decreased visual acuity, lacrimation, photophobia and ocular pain. Anterior segment lesions associated with the APS are dry eye, conjunctivitis, iritis, anterior uveitis, episcleritis, scleritis and iris neovascularization ***(Trojat et al., 2005).***

Photophobia has been referred in the cases of keratitis, dry eye and cataract ***(Suvajac et al., 2007).***

The anterior segment APS ocular signs include, among others, conjunctival, corneal, uveal and sclera lesions ***(Sobecki et al., 2004; Ermakova et al., 2005).***

In cases of posterior eye segment involvement, sudden, transient, partial and persistent visual loss, colour perception abnormalities, visual field loss or ocular and orbital pain have been described by APS patients. These manifestations may be correlated with uveitis, chorio-retinal arterial or vein occlusions, anterior ischemic optic neuropathy (AION), optic neuritis, vitreous hemorrhage or inflammation, macular serous or tractional retinal detachment, cystoid macular edema, neo-vascular glaucoma associated with severe ischemic chorioretinopathy, pseudotumor cerebri syndrome, cerebral venous thrombosis, posterior scleritis and thromboembolism induced by cardiac valves anomalies ***(Hartnet et al., 2003).***

Floaters can be found in the patients with, vitritis, vitreous haemorrhage or retinal detachment secondary to posterior segment ocular inflammation or chorioretinopathy ***(Ostanek et al., 2007).***

Metamorphopsia is present in the cases with cystoid macular edema or chorioretinal neovascularization after post-occlusive retinal vascular or inflammatory pathology and sometimes serous or tractional retinal detachments that involve the macula ***(Coroi et al., 2007).***

Amaurosis fugax (temporary and episodic monocular vision loss) is usually found in CNS and ocular ischemic cases due to severe extracranial internal carotid artery stenosis ***(Yehudai et al., 2007).***

Posterior segment lesions seem to be more frequent than the anterior ones and can be the first manifestation of the disease ***(Trojat et al., 2005).***

Venous tortuosity and dilatation are the most common among the posterior ocular abnormalities found in funduscopic evaluation, chorio-retinal vascular occlusions have been described also, and have been associated with increased levels of aPLs and interleukin 1 beta, 6 and 8 ***(Ilhan et al., 2005).***

Optic nerve involvement in the APS results from the vasculitic and vaso-occlusive events that involve the nerve anywhere in its pathway. The second cranial nerve lesions can occur in the context of the APS chorio-retinopathy, or as isolated events in APS patients, and clinically consist of optic disc edema and optic disc pallor with decreased visual acuity and color perception abnormalities. Those posterior segment signs correlated with acute retrobulbar optic neuritis (ARON), AION and progressive optic nerve atrophy (POA) ***(Srinivasan et al., 2001).***

Bilateral optic atrophy is usually a consequence of vasculitic involvement; the unilateral one, secondary to focal

thrombosis of posterior ciliary vasculature ***(Besbas et al., 2001).***

There are other less frequent subjective complains in APS patients: those with pseudo tumor cerebri and cerebral venous thrombosis due to brain venous sinus occlusion have described persistent wavy lines in the fields of vision ***(Giorgi et al., 2001).***

Those with nerve palsies complain of diplopia that can also be present in ischemic optic neuropathy, recurrent ischemic attacks and cerebral thrombosis, in association with visual field losses and color disturbances ***(Miserocchi et al., 2001).***

Laboratory tests are essential for the diagnosis and should be considered in patients with unexplained vascular occlusion .The diagnosis of APS is based on the presence of the aPLs, anticardiolipin antibodies (ACL) and lupus anticoagulant (LAC). A potential presence of systemic disease must be excluded ***(Suvajac et al., 2007).***

Detailed examination of the conjunctival and retinal vessels including fluorescein angiography is helpful not only for the eye evaluation, but also for the evaluation of the systemic microcirculation, the picture of which is mirrored in the eye ***(Ermakova et al., 2005).***

Treatment of ocular pathology in the APS includes not only the specific ophthalmological approach but a

comprehensive multidisciplinary evaluation and follow-up. Each ocular manifestation requires a particular and individualized local therapeutic regimen, generally assumed by the ophthalmologist, but in many cases systemic assessment is needed. As a useful guide, thrombotic events should be treated with anticoagulant drugs and vasculitic or inflammatory features with immunosuppressors. The patients have to be monitored on the regular basis particularly for international normalized ratio (INR) and aPLs ***(Srinivasan et al., 2001; Besbas et al., 2001).***