

Viral infections of the posterior segment of eye: What is the role of the Epstein Barr virus?

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Abstract

Background: The aim of this study is identifying the most representative pathogens causing infections of the posterior segment of the eye and verifying the correlation between clinical diagnosis and laboratory diagnosis. Moreover, another aim is the verification of the role of Epstein Barr virus that is often in association with other pathogens.

Methods and findings: In this study 35 cases of patients with suspected viral infections of the posterior segment of eye are presented. Among these, 18 were found positive for a microorganism with 22 selected positive plating test, 1 patient was tested 2 times and in 3 patients were found more than a virus. The analysis was performed in polymerase chain reaction real time. Analyzed viruses, all of the Herpesviridae family, are: Varicella Zooster (VZ) 7, Herpes Simplex ½ (HSV) 4, Epstein Bar virus (EBV) 5, Citomegalovirus (CMV) 2. In addition 4 Toxoplasma gondii (TG) were found. Epstein Barr Virus was found 2 times in association with Toxoplasma gondii, once with Varicella Zooster.

Conclusions: The pathogenic role of EBV remains uncertain. There is a correlation between the clinical diagnosis and virus isolated. The laboratory diagnosis is important for choice of therapy.

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Introduction

There are few studies that appraise the prevalence of the Herpesviridae in the infection of the back segment of eye [1-3]. There are more papers of single cases with particular characteristics [4-7]. Our study would be a first attempt to put in correlation clinical diagnosis and viral infections. Furthermore, this study is an attempt to clarify the position of the EBV [9-10], virus that many ophthalmologists consider not pathogen when it is in association with other pathogens and mostly with TG.

Methods

We report data from 35 patients, 19 males (54,2%) and 16 females (45,8%), aged between 16 and 86 years (the average is of 54,4 years) admitted at the Ophthalmic Hospital (Turin – Italy) in the last two years with suspected viral or toxoplasmic infections of the posterior segments of eye. Clinical criteria for diagnosis were: perivascular yellow-white retinal lesion associated or not with retinal hemorrhage, uveitis. Symptoms related were: floaters (specks or clouds in field of vision), blurred vision, loss of vision , worsening of perception of colours. The Herpesviridae and Toxoplasma gondii were identified with polymerase chain reaction real time in aqueous and/or vitreous humor and /or blood (Rotor-Gene Corbett research and ELITech group reagents). Amplification reaction is carried out specific for a gene region that codifies the Major DNA binding protein (ORF 29) of VZV, that codifies the protein EBNA-1 of EBV, that codifies the Glicoprotein D (gpD) of HSV. Amplification reaction is carried out for gene region MEIA of CMV and for gene region RE of TG. One patient was tested 2 times

Results

Among the 35 patients 18 (51,4%) were positive for at least one virus or toxoplasma.

Instead, selected positive plating tests were 22 as in 3 patients was found the association of parasite and virus: 2 cases of TG + EBV, and 1 case of virus + virus VZ and EBV. In addition, 1 patient was tested 2 times.

Number of cases	Pathogens	Clinical signs
4	HZV	ANR
1	HZV+EBV	ANR
2	HZV	Panuveitis
3	HSV	Panuveitis
1	HSV	Ipertensive uveitis
2	CMV	Retinal vasculitis
2	EBV	Panuveitis
1 same patient	TG+EBV	ANR
1 same patient	TG	ANR
1	TG+EBV	Vitreitis and retinitis
1	TG	Vitreitis and retinitis

VZ : 7 (32%) with clinical suspicion: Acute Necrotic Retinitis (ANR), Panuveitis

HSV: 4 (18%) with clinical suspicion: Panuveitis, Ipertensive uveitis

EBV : 5 (23%) of which 2 in association with TG and 1 with VZ with diagnosis of Vitreitis/Retinitis and ANR those in association with TG, and ARN that in association with VZ

CMV 2 (9%) With clinical suspicion : Retinal Vasculitis

TG: 4 (18%) of which 2 in same patient (in a collecting in association with EBV) and 1 in association with EBV in another patient. Clinical suspicions: ARN , Vitreitis/Retinitis.

It seems to exist a certain correlation between clinical suspect and diagnosis of laboratory; in particular, the diagnosis of ARN primarily correspond to the infections from VZ.

Discussion

From the data, some observations emerge:

1) the diagnosis of the deep infections of the eye, even if predominantly clinical, must be confirmed by laboratory tests for a correct therapeutic choice in all the uncertain cases

2) our observations open a discussion on the role of the virus EBV often considered by the oculists not to be the forehead responsible of the illness.

The inflammatory lesions of the back segment can be due to viral infections, parasitic infections or to autoimmune pathogenesis and therefore it is important to define the correct diagnosis for a correct therapy.

The two cases of EBV in association with TG have been followed. In the first case the antiviral therapy in association with anti-parasitic has allowed to make the improvement of the clinical picture, that did not have tendency to improve with the only anti-parasitic therapy . In this case EBV was jointly liable of the illness.

In the second case a weak viral position has also been found again in the blood and this has brought to define EBV as reactivated and not as pathogen.

These data must naturally be confirmed by further studies. However, it is fundamental the collaboration between microbiologist and clinician in the definition of all the serious cases to get the best therapeutic results.

References

1. Calvo CM Md, Khan MA Md, Mehta S Md et al. "Correlation of Clinical Outcomes with Quantitative Polymerase Chain Reaction DNA Copy Number in Patients with Acute Retinal Necrosis." *Ocul Immunol Inflamm.* 2016; 30:1-7.

2. Laaks D, Smit DP, Harvey J."Polymerase chain reaction to search for Herpes viruses in uveitic and healthy eyes: a South African perspective." *Afr Health Sci.* 2015;15(3):748-54.
3. Morishige N, Morita Y, Yamada N, et al." Differential Changes in Intraocular Pressure and Corneal Manifestations in Individuals With Viral Endotheliitis After Keratoplasty." *Cornea.* 2016;35(5):602-6.
4. Thrane AS, Hove M, Kjersem B, Krohn J"Acute retinal necrosis and ocular neovascularization caused by cytomegalovirus following intravitreal dexamethasone implant (Ozurdex®) in an immunocompetent patient." *Acta Ophthalmol.* 2016;94(8): e813-e814.
5. Pearce WA, Yeh S, Fine HF."Management of Cytomegalovirus Retinitis in HIV and Non-HIV Patients." *Ophthalmic Surg Lasers Imaging Retina.* 2016;47(2):103-7.
6. Gupta M, Jardeleza MS, Kim I et al." Varicella Zoster Virus Necrotizing Retinitis in Two Patients with Idiopathic CD4 Lymphocytopenia." *Ocul Immunol Inflamm.* 2016;24(5):544-8
7. Nakamura T1, Daikoku T2, Shiraki K2, et al." Detection of cytomegalovirus in an immunocompetent adult presenting with acute retinal necrosis due to varicella-zoster virus: a case report." *Clin Ophthalmol.* 2015; 9:853-8.
8. Ramaiya KJ, Rao PK."Herpetic necrotizing retinitis following flucinolone acetone intravitreal implant. " *Ocul Immunol Inflamm.* 2011;19(1):72-4.
9. Freigassner P, Ardjomand N, Radner H,et al."Coinfection of the retina by Epstein-Barr virus and cytomegalovirus in an AIDS patient. " *Am J Ophthalmol.* 2002;134(2):275-7.
10. O'hara M, Lloyd WC 3rd, Scribbick FW,et al."Latent intracellular Epstein-Barr Virus DNA demonstrated in ocular posttransplant lymphoproliferative disorder mimicking granulomatous uveitis with iris nodules in a child." *J AAPOS.* 2001;5(1):62-3.

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