

LETTER TO THE EDITOR

Open Access



Effect of SARS-CoV-2 mRNA vaccination on ocular herpes simplex and varicella-zoster virus reactivation: should preventive antiviral treatment be given in known herpes patients

Carl P. Herbert Jr* and Ioannis Pappasavvas

To the editor.

Herpesviruses, including herpes simplex virus 1 (HSV-1) and varicella-zoster virus (VZV) are commensal viruses of humans since millenarians.

Close to 80% of adults in temperate countries are exposed to HSV-1 and this proportion reaches more than 97% in case of VZV [1].

After primo-infection these viruses remain in a latent form in sensory neuronal ganglia. The colonisation of the ganglia, including the trigeminal ganglion, occurs by progression of the virus mainly within peptidergic neurons [2]. Latency is an active and complex immune mechanism where CD8-positive T cells play an important role [3]. Although mRNA vaccines stimulate CD8+ T cells it could be hypothesised that it might dysregulate latency mechanisms in the sensory nerve ganglions [4]. In case of sarcoidosis when T cells are monopolised in the granulomas there is rescue humoral compensation to control herpes viruses by polyclonal anti-herpes antibody activation [5]. In case of transient or prolonged dysfunction of the immune system by diverse causes, reactivation of the virus can occur. It then reinfects peripheral sites by travelling down neurons causing herpes labialis, dendritic keratitis, herpetic uveitis or shingles in case of VZV virus. A recent study reported 14/414 (3.4%) cases of herpes simplex and varicella-zoster eruptions among cutaneous findings after mRNA-based vaccinations, a relatively large percentage [6]. However, no

details were given on these patients. We recently reported on three cases of herpes zoster ophthalmicus (HZO) after mRNA anti-SARS-CoV-2 vaccinations (Moderna and Pfizer BioNTech respectively), 2 weeks after first dose vaccination in two patients and 2 weeks after a Pfizer BioNTech booster vaccination in another patient who had undergone Covid-19 infection [7]. Non ocular varicella-zoster reactivations after mRNA vaccinations have recently been reported [8].

Case report

We recently examined a 53-year-old man, treated in the past for herpes kerato-uveitis OD that had been inactive for 18 months without treatment. Five days after the second dose of Moderna vaccine, he presented with a severe flare-up of a granulomatous hypertensive uveitis in his right eye with numerous granulomatous KPs and an increased pressure of 41 mmHg (Fig. 1). Under valacyclovir (500 mg QID), 0.1% dexamethasone drops QID and dorzolamide hydrochloride – timolol maleate eye drops BID, pressure normalised within 6 days, laser flare photometry (LFP) flare, decreased from 19.4 ph/ms to 13.2 ph/ms 3 weeks later and granulomatous KPs had almost disappeared. Because of fluctuating IOP and LFP values thereafter, Valacyclovir (500 mg BID), Acetazolamide (125 mg/day), dorzolamide hydrochloride BID and dexamethasone 0.1% eye drops once daily had to be maintained until the last recorded follow-up two and a half months later with LFP values of 12.2 ph/ms and an IOP value of 16 mmHg.

* Correspondence: cph@herbortuveitis.ch

Inflammatory and Retinal Eye Diseases, Centre for Ophthalmic Specialised Care (COS), Rue Charles-Monnard 6, 1003 Lausanne, Switzerland

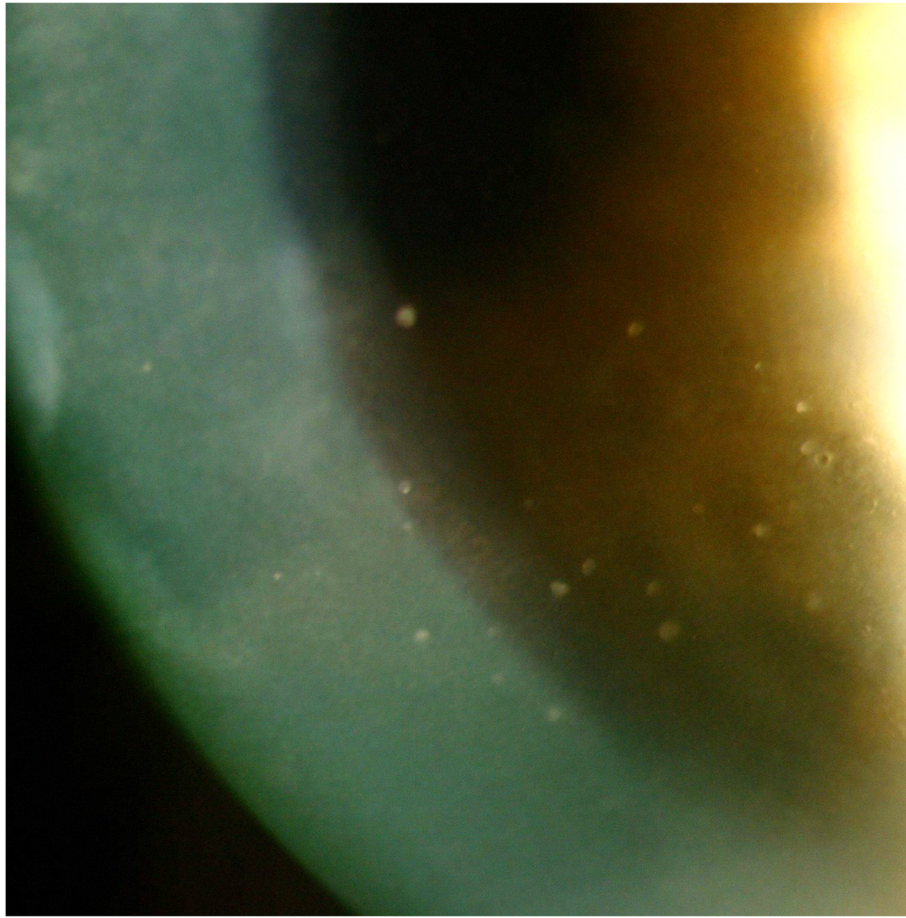


Fig. 1 Herpetic kerato-uveitis: Numerous granulomatous KPs on the endothelium

It is difficult to know whether this episode was purely inflammatory. Even if this was the case dual corticosteroid and antiviral therapy has to be given in such circumstances.

Since this case, we advise patients having had several herpes uveitis episodes to remain under valacyclovir therapy during vaccination despite quiet uveitis to avoid potential reactivation, which was undertaken for two patients so far.

Comment

HSV-1 and VZV infections can cause substantial ocular morbidity. Since the availability of efficient antiviral agents, management of eye disease caused by herpes viruses are successfully treated in most cases and complications have been reduced [9]. However, each new episode can harm eye structures. Moreover, some herpes reactivations such as acute retinal necrosis are much more deleterious and their management much more difficult. Therefore, in patients having presented herpesvirus infections in the past, the question can be raised

whether preventive antiviral therapy should be recommended, possibly at least in high-risk patients, in case of mRNA vaccination after discussing it with the patient.

Abbreviations

HSV-1: Herpes simplex virus 1; VZV: Varicella-zoster virus; CD8+ T cells: Cluster of differentiation 8 positive T cells; mRNA: Messenger ribonucleic acid; HZO: Herpes zoster ophthalmicus

Acknowledgements

n/a.

Authors' contributions

All authors contributed equally in writing and editing the article.

Funding

We did not receive any funding.

Availability of data and materials

For data, please refer to corresponding author.

Declarations

Ethics approval and consent to participate

This brief report has been performed in accordance with the ethical standards as laid down in 1964 by the declaration of Helsinki and its later amendments. Anonymous case reports are approved by the ethics

committee of our institution (EC-COS-MTC) as long as written consent is obtained from the patients.

Consent for publication

Consent was signed by the patient.

Competing interests

No conflict of interest.

Received: 23 June 2021 Accepted: 29 August 2021

Published online: 17 September 2021

References

1. Olsson J, Kok E, Adolfsson R, Lövheim H, Elgh F (2017) Herpes virus seroepidemiology in the adult Swedish population. *Immun Ageing* 14(1):10. <https://doi.org/10.1186/s12979-017-0093-4>. eCollection 2017
2. Herbert CP, Weissmann SS, Payan DG (1989) Role of peptidergic neurons in ocular herpes simplex infection. *FASEB J* 3(13):2537–2541. <https://doi.org/10.1096/fasebj.3.13.2537>
3. St Leger AJ, Hendricks RL (2011) CD8+ T cells patrol HSV-1 infected trigeminal ganglia and prevent viral reactivation. *J Neuro-Oncol* 17(6):528–534. <https://doi.org/10.1007/s13365-011-0062-1>
4. Perng GC, Jones C. Towards an understanding of the herpes simplex virus type 1 latency-reactivation cycle
5. Papasavvas I, Gehrig B, Herbert CP Jr (2021) The comparative value of serum angiotensin converting enzyme (ACE) and lysozyme and the use of polyclonal antibody activation in the work-up of ocular sarcoidosis. *Diagnostics (Basel)* 11(4):608. <https://doi.org/10.3390/diagnostics11040608>
6. McMahon DE, Amerson E, Rosenbach M, Lipoff JB et al (2021) Cutaneous reactions reported after Moderna and Pfizer Covid-19 vaccination: a registry-based study of 414 cases. *J Am Acad Dermatol* 85(1):46–55. <https://doi.org/10.1016/j.jaad.2021.03.092> Epub 2021 Apr 7
7. Papasavvas I, de Courten C, Herbert CP Jr. Varicella-zoster virus reactivation causing herpes zoster ophthalmicus (HZO) after SARS-CoV-2 vaccination : 3 cases. *J Ophthalmic Inflamm Infect* 2021; in print
8. Rodriguez-Jimenez P, Chicharro P, Cabrera LM, Segui M, Morales-Caballero A, Llamas-Velasco M, Sanchez-Perez J (2021) Varicella-zoster virus reactivation after SARS-Cov-2 BNT162b2 mRNA vaccination: report of 5 cases. *JAAD Case Rep* 12:58–59. <https://doi.org/10.1016/j.jdc.2021.04.014> Epub 2021 Apr 24
9. Herbert CP, Buechi ER, Piguat B, Zografos L, Fitting P (1991) High-dose oral acyclovir in acute herpes ophthalmicus: the end of the corticosteroid era. *Curr Eye Res* 10(Suppl):171–175. <https://doi.org/10.3109/02713689109020375>

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Submit your manuscript to a SpringerOpen[®] journal and benefit from:

- Convenient online submission
- Rigorous peer review
- Open access: articles freely available online
- High visibility within the field
- Retaining the copyright to your article

Submit your next manuscript at ► [springeropen.com](https://www.springeropen.com)
