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Case Report

Reactivation of Herpes Zoster after First and Second Dose of Covid-19 Vaccine

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Abstract

We describe a case of Herpes Zoster ophthalmicus that showed reactivation after the first and second dose of covid 19 (Coronavac) inactive vaccine.

Keywords: COVID-19; Sars-Cov-2; Herpes Zoster, Herpes Zoster Ophthalmicus, Covid-19 Vaccines

Introduction

Varicella-zoster virus (VZV) is a herpes virus that causes chickenpox, which remains latent in dorsal root ganglia after its primary infection. The disease happens because of VZV reactivation in cranial nerves and dorsal spinal root ganglia, usually triggered decades after primary chickenpox infection [1,2].

Herpes Zoster ophthalmicus (HZO) is the reactivation of the VZV in the ophthalmic branch of the trigeminal nerve, a pathology that affects more elderly and immunocompromised patients. Ocular manifestations occur in approximately 17% of HZO cases, among them, we mention external ocular disease (vesicular eruption), involvement of the anterior segment (interstitial keratitis or disciform keratitis, punctate or dendritic epithelial erosion, reduced ocular sensitivity, scleritis, uveitis, the elevation of ocular pressure and posterior segment impairment (retinal vasculitis, choroiditis, acute retinal necrosis) [3].

The coronavirus is widespread among birds and mammals, with the bat being the main reservoir. Transmission occurs from person to person by direct transmission, contact transmission and air transmissions through aerosols. Coughing, sneezing, inhaling droplets, contact with oral, nasal, and ocular mucosa are common paths of dissemination. Coronavirus disease (Covid-19) is a pathology that causes a respiratory tract infection with variable clinical presentation, from mild infections to severe acute respiratory syndrome (SARS COV-2) [4].

One of the lines of treatment in progress is the use of inactivated virus vaccines to contain the spread of the virus. Brazil, through the Butantan Institute, is developing the Coronavac (Sinovac Biotech, China) and vaccine. This vaccine contains the inactivated SARS-COV-19 virus antigen, which stimulates the body to induce an immune response against the virus, preventing the disease and its spread [5].

Case Report

A 59-year-old female patient was treated with immunomodulators due to lung cancer. went to an ophthalmological office complaining of pain in the left eye (OS) associated with photophobia in December 2020. She also mentioned a previous treatment for Herpes Zoster on the back.

On physical examination, he presented visual acuity in the right eye (OD) of 20/20 and 20/30 in the left eye (OS), decreased corneal sensitivity and biomicroscopy showed a central dendritic lesion in the cornea evidenced by Rose Bengal staining, without anterior chamber reaction, absence of keratin precipitates (PK) and no signs of bacterial infection.

The diagnostic hypothesis followed as HZO. As conduct, Acyclovir 800 mg 5 times a day was prescribed, sodium hyaluronate 0.15% free on-demand. The patient was re-evaluated within 72 hours and evidenced closure of dendritic lesion, and 1% prednisolone acetate was introduced in regression. After 26 days, her visual acuity was 20/20 in both eyes and a corneal nebula was evidenced in her left eye and she no longer had ocular complaints.

The patient returned on March 2021 complaining of discomfort and pain in her left eye. On that occasion, she mentioned that 5 days before, he had taken the first dose of Coronavac (vaccine against COVID). Her visual acuity at the time was 20/20 in OD and 20/30 in OS. Biomicroscopy showed a dendritic lesion typical of herpes zoster (Figure 1). She started using Acyclovir 800 mg 5 times a day for seven days and, after that, a prophylactic dose of 800 mg/day for 2 months. The patient had the resolution of the condition after 7 days.

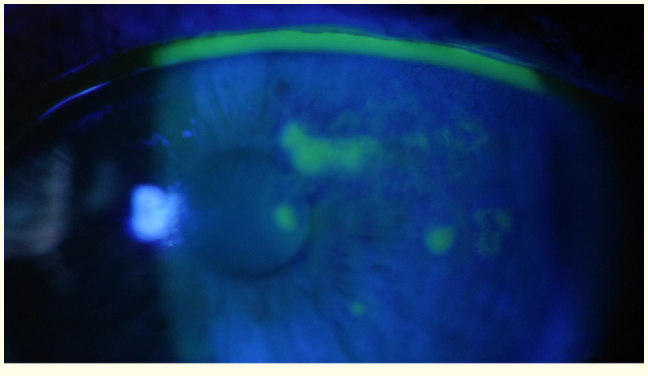

Figure 1: Corneal dendrites suggestive of HZO reactivation.

The patient returns on April 2021, reporting that he took the second dose of the vaccine against COVID-19 (Coronavac) a week before and presented relapse of a herpetic ocular lesion on biomicroscopy and decrease of visual acuity in the left eye (20/40). The use of acyclovir 800mg 5 times a day for seven days was prescribed again and also the prophylactic treatment for another 2 months. After the resolution of the dendritic lesion, topical corticosteroids were introduced, starting every 6 hours and regressing every 7 days to decrease corneal opacity. After a course of corticosteroids, the use of tacrolimus 0.03% aqueous solution was started for 2 months to prevent scarring complications on the ocular surface. The patient returned after 14 days of treatment, with no signs of recurrence, with improvement in visual acuity to 20/30, partial improvement in corneal opacity and no signs of HZO (Figure 2).

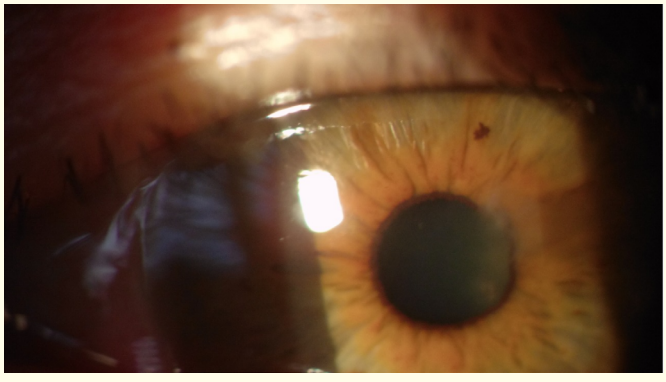

Figure 2: Corneal haze after the resolution of HZO infection

Discussion

The manifestation of Herpes Zoster, as already mentioned, is due to the reactivation of this virus after a situation in which the immune system is compromised. The manifestations are mostly dermatological lesions that accompany dermatomes, these secondary lesions can lead to lesions that involve dermatomes innervated by the trigeminal nerve (V pair of the cranial nerve), characterized by Herpes Zoster ophthalmicus. There are 3 mechanisms of ocular involvement: direct viral invasion, secondary inflammation, and reactivation. The latter involves the affected sensory ganglion, causing corneal hypoesthesia that can lead to neurotrophic keratopathy [6-8].

Acute epithelial keratitis develops in more than 50% of cases in HZO and it is characterized by dendritic lesions that are smaller and thinner than those of herpes simplex, lack terminal bulbs and dichotomous branching. They stain more easily with Rose Bengal, similarly that we found in our case [1,2].

According to Nofal., *et al*. in his report, there was a reactivation of Ophthalmic Herpes Zoster and endophthalmitis in immunocompetent patients, 5 days after the onset of symptoms of Covid-19. Demonstrating that the viral infection by covid itself may have been a factor in the compromise of the immune system [9].

Bostan., *et al.* found reactivation of Systemic Herpes Zoster in 1 male patient, 5 days after a dose of the attenuated virus vaccine. The patient was not using any immunosuppressive therapy and the cancer history was previous as he was cured after surgery, in the case of an immunocompetent patient [10].

Our patient presented risk factors for reactivation of HZO like incompetence of the immune system due to lung cancer and the use of immunomodulators. Nevertheless, the coincidence of the moment of reactivation of the disease close to the application of the vaccine cannot be ignored. The patient had the application of the inactivated Covid-19 vaccine, with two episodes of re-emergence of the HZO. The time elapsed between the dose of the vaccine and the onset of symptoms was five to seven days. The reactivation after the second dose of the vaccine corroborates the possibility of the post-vaccination factor triggering a surface viral reactivation response eye [6-12].

Vaccine-related immunomodulation includes suppression of cellular immunity, even though it is not possible to establish a direct relationship between the manifestation of HZO and the vaccine against covid, it is possible to establish that during the post-vaccination state the immune system is less efficient, making the individual more susceptible to opportunistic infections, due to immune dysregulation triggered by the vaccine response [5].

In the treatment of corneal scar, a less potent alternative than corticosteroids, with good efficacy and better safety, is the use of tacrolimus eye drops. Its advantage is that there is no restriction in the treatment time limit when compared to corticosteroids, which have several side effects such as glaucoma, cataract and increased intraocular pressure. This medication is already used to treat subepithelial infiltrates due to adenoviral infection [13].

Herpes Zoster reactivation is a condition impacted by any change in the immune system, whether in immunocompetent or immunocompromised patients. There is no report in the literature, to date, of a relationship with HZO reactivation with the administration of the attenuated virus vaccine of COVID-19. However, we present a case in which, five to seven days after the inactivated virus vaccine, there was HZO reactivation.

This case suggests the need for further studies in this area to determine whether prophylaxis or even to determine a specific vaccine for patients with a previous history of HZ and HZO.

Conflict of Interest

The authors declare no conflict of interest.

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