

Recurrence of tubercular choroiditis following anti-SARS-CoV-2 vaccination

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Abstract

Purpose: To report recurrence of tubercular choroiditis following anti-SARS-CoV-2 vaccination in two patients with quiescent disease activity for more than a year.

Methods: Retrospective observational case reports.

Results: Two patients (one female and one male) under follow-up for posterior uveitis having stable course with absence of ocular inflammation for more than a year presented with recurrence of choroiditis lesions 2–6 weeks following anti-SARS-CoV-2 vaccination. Both the patients were managed with intravitreal dexamethasone implant (Ozurdex®, Allergan, Inc., Irvine, CA, USA) and showed resolution of choroiditis lesions upon follow-up.

Conclusions: Acute onset recurrence of inflammation, in absence of any change in health status or treatment suggests the potential role of vaccination being the trigger of this reactivation. Given large-scale vaccination against novel coronavirus-SARS-CoV-2, careful vigilance is warranted to pick up the disease recurrence in patients with posterior uveitis.

Keywords

immunology, IMMUNOLOGY, choroidal/retinal inflammation, UVEA, posterior uveitis, UVEITIS, UVEITIS, RETINA

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Introduction

The global pandemic of coronavirus disease (COVID-19) has emerged as worldwide public health problem. The need to immunise vast populations has led to accelerated development of anti-SARS-CoV-2 vaccines. With such large-scale vaccination, there is a parallel surge in reported number of vaccine related side-effects or associated phenomenon. In this series, we report two cases of quiescent choroiditis, who developed recurrence of intraocular inflammation following anti-SARS-CoV-2 vaccination (ChAdOx1 nCov-19, AstraZeneca).

Case I

A 20-year-old Asian Indian female presented three years ago with decreased vision in her right eye for past one month. At presentation her best corrected visual acuity (BCVA) was Counting Fingers Close to Face (CFCF) in both eyes (OU). Slit lamp biomicroscopy was unremarkable.

Fundus examination showed 2 + vitritis with disc edema and an active placoid choroiditis patch in right eye while healed choroiditis scar was present in left eye. Her tuberculin skin test (TST) (14 × 14 mm) and QuantiFERON TB Gold were positive, while Contrast Enhanced Computed Tomography (CECT) chest was normal. She received intravitreal dexamethasone (0.7 mg) implant (Ozurdex®,

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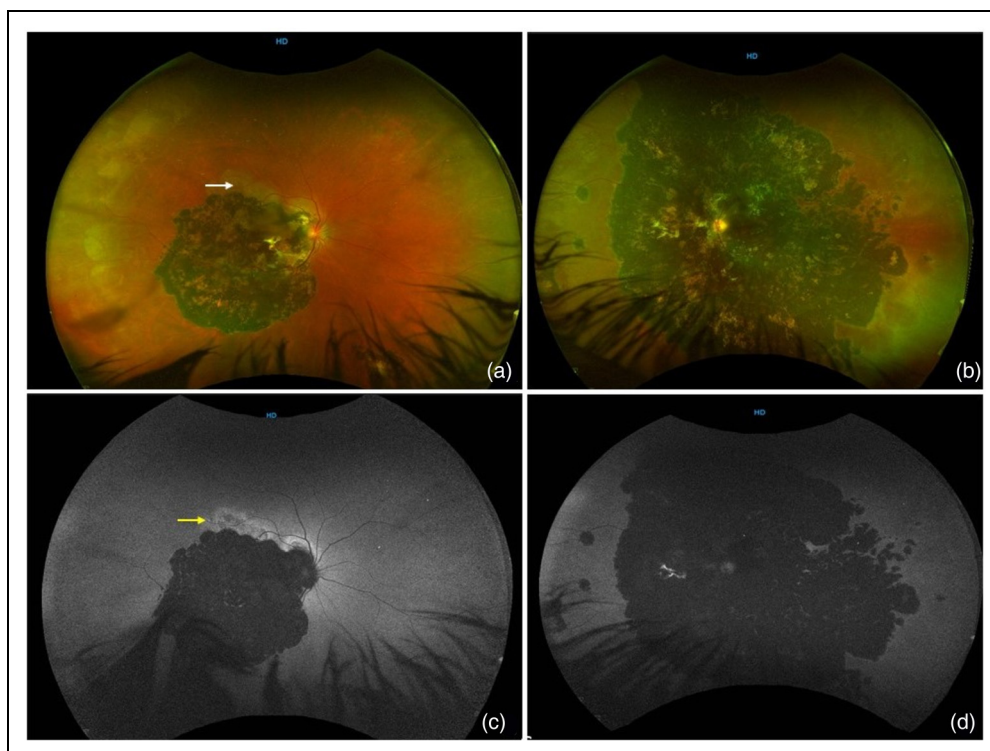


Figure 1. Ultra wide-field (UWF) fundus photograph of right eye showing active choroiditis (white arrow) at the upper edge of a pigmented scar (a). Corresponding fundus autofluorescence (FAF) shows hyperautofluorescence (yellow arrow) at the upper edge of hypoautofluorescent healed lesion (c). A large, pigmented macular scar (b) that appears hypoautofluorescence on FAF (d) is present in left eye.

Allergan, Inc., Irvine, CA, USA) along with 4-drug anti-tubercular therapy (Rifampicin 450 mg, Isoniazid 300 mg, Pyrazinamide 1250 mg, Ethambutol 1000 mg). The patient responded to treatment with resolution of active choroiditis lesions and vision improving to 20/100 in the right eye. The anti-tubercular therapy was stopped after nine months. On follow up, patient was stable and free of any recurrence without any medications for the last three years. Recently she presented with diminution of vision in the right eye of three weeks duration. She had received her first dose of Covishield vaccine (ChAdOx1 nCov-19, AstraZeneca) two weeks prior to onset of diminution in vision. Her BCVA in the right eye had dropped to CF/CF. Anterior segment examination revealed 2+ cellular reaction while fundus examination showed 2+ vitreous cells and active choroiditis at the superior edge of previous choroiditis scar. The anterior and posterior segment examination did not show any sign of active inflammation in left eye (Figure 1(a) and (b)). Fundus autofluorescence (FAF) revealed hyperautofluorescence corresponding to the active choroiditis lesion in the right eye while hypoautofluorescent choroiditis scar was present in the left eye (Figure 1(c) and (d)). Serological investigation (Abbott CE) showed presence of Immunoglobulin G (IgG) against SARS-CoV-2. The patient was treated with intravitreal injection dexamethasone

(0.7 mg) (Ozurdex®, Allergan, Inc., Irvine, CA, USA) There was significant resolution of the choroiditis lesions within two weeks of the treatment with vision improving to 20/400 upon follow-up.

Case II

A 26-year-old Asian Indian male was diagnosed with tubercular serpiginous like choroiditis (SLC) two years ago and treated with oral steroids and 4-drug ATT. Patient was stable with no recurrences for past two years till two weeks ago when he presented with complain of floaters in the right eye. The patient was off treatment for past two years. He had received his first dose of Covishield vaccine (ChAdOx1 nCov-19, AstraZeneca) 6 weeks prior to onset of ocular symptoms. On examination, his best corrected visual acuity was 20/20 in both eyes. Anterior segment examination of the right eye revealed 1+ cellular reaction while fundus examination showed 2+ vitritis and active choroiditis lesions in macular area with healed lesions in the midperiphery. Anterior and posterior segment examination of left eye was normal (Figure 2(a) and (b)). FAF showed hyperautofluorescence corresponding to the active choroiditis lesions (Figure 2(c)). Serological investigation (Abbott CE) showed presence of Immunoglobulin G (IgG) against SARS-CoV-2. In view of

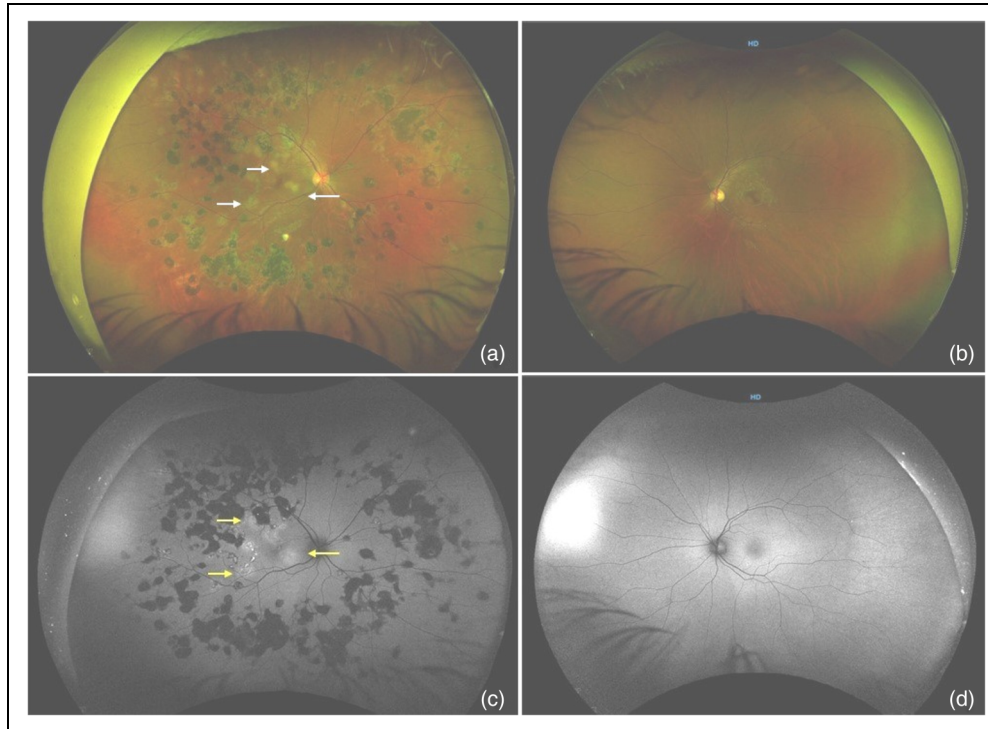


Figure 2. UWF fundus photograph of right eye showing active choroiditis lesions (white arrows) at the fovea with healed lesions in the mid periphery (a). The lesions appear hyperautofluorescent (yellow arrows) on FAF (c).

uniocular involvement, intravitreal injection dexamethasone (0.7 mg) (Ozurdex®, Allergan, Inc., Irvine, CA, USA) was given. At the time of his last follow up two weeks following treatment, there was marked resolution of choroiditis lesions while VA remained stable at 20/20.

Discussion

Recurrence of posterior uveitis has recently been reported following COVID-19 infection/ vaccination. Nicolai et al.¹ reported reactivation of punctate inner choroidopathy (PIC) reactivation following COVID-19 in a 29-year-old Caucasian woman 3 weeks following SARS-CoV-2 infection. The active choroidal lesions responded to high-dose corticosteroids, with functional improvement. The authors attributed the disease recurrence to autoimmune and autoinflammatory dysregulation following Sars-CoV-2 infection. In another report by Papasavvas et al.,² a 48-year old woman presented with reactivation of VKH disease 6 weeks after the second dose of Pfizer anti-SARS-CoV-2 vaccination. Her ocular inflammation had been under control on 10 weekly infliximab for past 6 years. In our series, recurrence of healed tubercular choroiditis lesions was observed 2–6 weeks following COVID vaccination. The onset of symptoms after 2–6 weeks probably suggests complex immunological mechanism, that requires some time to translate into disease resurgence with vaccination

acting as a trigger for this reactivation. Molecular mimicry, epitope spreading, bystander activation, presentation of cryptic antigens, B-cell polyclonal activation and the existence of the viral and/or bacterial superantigens have been suggested as possible pathological mechanisms behind autoimmune responses in SARS-CoV-2 infected patients.^{3,4} Either of these mechanisms might have resulted in recurrence of inflammation in our cases. Development of posterior uveitis has previously been reported as a rare adverse effect following influenza, hepatitis B, yellow fever and BCG vaccinations. There have been reports of multiple evanescent dot syndrome (MEWDS),^{5,6} acute posterior placoid pigment epitheliopathy (APMPPE)⁷ and unilateral acute idiopathic maculopathy (UIAM)⁸ following influenza vaccination while VKH disease has been reported following Hepatitis B, yellow fever and BCG vaccinations.^{9–11} It is interesting to see recurrence of tubercular posterior uveitis following COVID-19 vaccination in our series and this adds to the list of potential ocular associations with anti-SARS-CoV-2 vaccination. Therefore, it becomes important to obtain information regarding the vaccination status of individual while taking medical history of the uveitis patients, especially those with serious posterior segment disease.

When such an unprecedented large-scale vaccination programme is organised, substantial number of side-effects and possible associations are expected. It should however

not deter us from large scale vaccination needed to overcome this pandemic, but at the same time one needs to be vigilant about very low but possible risk of ocular side effects.

Limitations

Though both the patients showed positive serology against SARS-CoV-2, autoreactive T cell profiling against retinal antigens could not be performed in our patients. Molecular/ cytological profiling would be useful in future studies to establish pathophysiological mechanism of vaccine resulting in stimulation of autoreactive T cells.

Declaration of conflicting interests

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Precis


Two patients presented with recurrence of tubercular choroiditis, 2–6 weeks following anti-SARS-CoV-2 vaccination. Both the patients had quiescent lesions with absence of intraocular inflammation for more than a year before presenting with disease reactivation. Autoimmune dysregulation provoked by anti-SARS-CoV-2 vaccination may have a role in causing the reactivation of the choroiditis lesions.


Statement of consent


Informed consent was taken from the patients to use their medical records and clinical images for academic purpose.

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