ISSN: 1813-1638

The Medical Journal of Tikrit University

Available online at: www.mjotu.com

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Herpes simplex viral epithelial keratitis following pars plana vitrectomy

ABSTRACT

Aim:

To investigate the incidence, and time of onset of Herpes simplex viral epithelial keratitis (HSVEK) following pars plana vitrectomy (PPV).

Patients and methods: This is a prospective study of all patients undergoing pars plana vitrectomy by one vitreo-retinal surgeon from January 2014 till January 2019.

Results:

865 cases underwent of pars plana vitrectomy, and 8 (0.93%) cases of HSVEK occurred during the first 4 weeks postoperatively. These cases were detected one day (n = 1), one week (n = 6), and one month after surgery (n = 1).

Conclusions: HSVEK is a possible complication after PPV surgeries. Most cases occurred in the first postoperative week.

Keywords:

Herpes, simplex keratitis, vitreoctomy.

A R T I C L E I N F O

Article history:

Received	06 Dec	2019
Accepted	12 Jan	2020
Available online	01 Dec	2021

DOI: http://dx.doi.org/10.25130/mjotu.27.2021.01

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Introduction:

Herpes simplex virus (HSV) is endemic worldwide. Nearly 75% of the general population are infected with this virus during their life, and infection is more common in low socioeconomic groups.[1] Anti-HSV antibodies are detected in the serum of 50% to 90% of individuals above the age of 15 years.[2]

Primary HSV infection occurs in early life after contact with an infected person and is generally asymptomatic. HSV can establish latency in either the trigeminal ganglia or the cornea after primary infection. Reactivation of the infection may occur later in life and the risk factors for reactivation are depressed immunity, fever, stress, over exposure to sunlight and use of immunosuppressing agents such as corticosteroids.[3] Eye infection affects less than 1% of those exposed to the virus.[4] HSV epithelial keratitis (HSVEK) usually represents reactivation of the HSV infection rather than primary infection.

Previous studies have reported HSVEK as a complication of cataract surgeries,[5-7] refractive surgeries,[8,9] and different keratoplasty surgeries.[10-12] Ocular surgeries are associated with stress and the use of topical corticosteroids, and these may trigger the latent viral infection. The aim of this study is to report the incidence of HSVEK after pars plana vitrectomy (PPV).

Patients and Methods

This is a prospective study that involved all patients who underwent PPV, for different indications, by one surgeon from 2014 and 2019 at Ibn Al-Haetham Teaching Eye Hospital. Pre-operative assessments included medical and ophthalmic history taking, including any known previous keratitis. Comprehensive ophthalmic examination was performed including any corneal opacities, vascularization, or depressed corneal sensation that may indicate previous viral keratitis. PPV surgeries were performed under local or general anesthesia. Patients were scheduled follow-up postoperative

examinations after one day, one week and one month. Postoperatively, patients were instructed to use topical antibiotic eye drops (ciprofloxacin or moxifloxacin) and dexamethasone eyedrops 4 times per day for 4 weeks. Patients with clinical signs of HSVEK, either dendritic or amoeboid epithelial keratitis, during the first 4 weeks postoperatively were enrolled in this study. Examination of the infected eye was performed under slit lamp with staining of the cornea. Dendritic ulcers had typical branching shape with terminal bulbs, while amoeboid ulcers were geographically shaped ulcers with scalloped margins. The bed of the ulcer stains with Fluorescence dye while the margins stain with Rose Bengal. Corneal sensation was also assessed as HSVEK is typically associated with diminished sensation. Other causes of keratitis, such as bacterial or neurotrophic keratitis, were excluded. Demographic data (age, gender, and occupation) of the included patients were reported. Management of the infected eyes was with topical acyclovir 3% ointment 5 times daily, or with systemic acyclovir 400 mg 5 times daily, for 2 to 3 weeks.

Results

During the six years of this study, 865 cases of PPV were performed by the author. PPV was done for rhegmatogenous retinal detachment (387 cases), advanced diabetic retinopathy (vitreous hemorrhage and tractional retinal detachment, 352), non-diabetic vitreous hemorrhage (74), dislocated intra-ocular lens (43), and intraocular foreign bodies (9 cases). Out of 865 cases of PPV, 706 cases (81.6%) were done under local anesthesia. HSVEK occurred during the first 4 weeks postoperatively in 8 cases (0.93%). One case with a dendritic ulcer presented in the first postoperative day; six cases with amoeboid ulcers were presented in the first week postoperatively; while the last case presented with large amoeboid viral keratitis and was detected on the fourth postoperative week examination.

On the pre-operative examination, one case had a small vascularized

paracentral corneal opacity. This patient had known history of viral keratitis. The patient developed recurrence of the viral keratitis in the first postoperative day. Clinical characteristics of the patients with HSVEK are shown in Table 1. All patients were over 50 years old, and five of them were female. Three patients were diabetic, two patients were hypertensive, and one had CVA in the previous year before PPV.

HSVEK occurred following PPV performed for rhegmatogenous retinal detachment (4 cases), advanced diabetic retinopathy (3 cases), and dislocated IOL (one case). All PPV surgeries complicated by HSVEK had been performed under local anesthesia. All PPV patients had been prescribed topical corticosteroid and antibiotic eyedrops. Corticosteroids were stopped in patients with HSVEK and they were prescribed oral Acyclovir 400mg five times daily for 3 weeks. All patients responded well to the treatment and the keratitis healed without complications.

Table 1: Demographic characteristics, systemic and ocular disorders in patients with herpes simplex viral epithelial keratitis following pars plan vitrectomy (presented successively).

Patient	Age	Gender	Systemic diseases	Eye disorders	Time of onset of HSVEK
1	62	female	DM	ADR	First postoperative week
2	51	female	Nil	RRD	First postoperative week
3	57	male	DM + HT	ADR	Fourth postoperative week
4	52	female	DM	ADR	First postoperative week
5	55	male	Nil	RRD	First postoperative week
6	60	female	Nil	Dislocated IOL	First postoperative day
7	57	male	HT + CVA	RRD	First postoperative week
8	54	female	Nil	RRD	First postoperative week

HSVEK: Herpes simplex viral epithelial keratitis
RRD: Rhegmatogenous retinal detachment
ADR: Advanced diabetic retinopathy

IOL: Intra-ocular lens
DM: Diabetes mellitus
HT: Hypertension

Discussion

In the current study, the incidence of HSVEK following PPV was 0.93%. Previous studies had reported that HSVEK can occur as a complication of various eye surgeries. Emotional stress associated with the surgery may predispose to the reactivation of a latent viral infection in the cornea. This may be especially applicable after the long-lasting PPV procedures. Use of topical corticosteroids during and after the PPV may contribute to the flare up of the viral keratitis. A previous history of herpes simplex viral keratitis may carry an increased risk of recurrence after ocular surgeries. But the absence of such a history does not eliminate the possibility of activation of a latent virus from an old subclinical primary infection.

Chen and colleagues reported an incidence of persistent corneal epithelial defects following PPV of 4.8%, and there was a high incidence of geographical HSVEK among recalcitrant cases (36%).[13] HSVEK has to be differentiated from other similar corneal disorders that can occur postoperatively. The characteristic dendritic or geographical ulcers are almost pathognomonic for HSVEK. Polymerase chain reaction (PCR) can be used to diagnose HSVEK especially in atypical cases.[14,15] In the current study, all cases were with typical presentation and clinical features. Additionally, the rapid response to antiviral treatment in all reported cases here confirmed the diagnosis without the requirement for PCR.

Conclusion

HSVEK is a possible complication after PPV surgeries. Most cases occurred in the first postoperative week.

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