

## Original Research Article

# Pattern of Herpes Simplex Virus Keratitis at A Tertiary Eye Care Center in Mid-Western Region of Nepal

Jyoti Sapkota<sup>1\*</sup>, Santosh Subedi<sup>1</sup>, Sulaxmi Katuwal<sup>1</sup>, Nita Sunam<sup>1</sup>, Suresh BK Rasaily<sup>1</sup>, Om Yadav<sup>1</sup><sup>1</sup>Rapti Eye Hospital, Rakshyachaur, Tulsipur-4, Dang, Nepal**Article History**

Received: 26.12.2022

Accepted: 31.01.2023

Published: 04.02.2023

**Journal homepage:**<https://www.easpublisher.com>**Quick Response Code**

**Abstract: Objective:** The purpose of the study was to determine the clinical pattern of Herpes Simplex Virus (HSV) Keratitis and to evaluate the precipitating factors and associated visual loss. **Materials and Methods:** This was a retrospective study of all consecutive patients clinically diagnosed with HSV keratitis in the Cornea department of Rapti eye hospital from January 2022 to December 2022. The major outcome measures studied were demographic characteristics, clinical pattern of HSV keratitis, precipitating factors and visual acuity. **Result:** A total of 218 cases of HSV keratitis were included in the study. Mean age of patients was 39.23±20.19 years with majority belonging to age group 15-40 years. Stromal keratitis was the most common manifestation (109 cases; 50%) followed by disciform keratitis. Majority of cases had spontaneous onset and others had precipitating factors like minor ocular trauma, steroid and fever. Presenting visual acuity of <3/60 was present in 14.2% of cases. **Conclusion:** Productive age group are most commonly affected with HSV keratitis with stromal keratitis as the most common presentation. HSV keratitis may lead to significant scarring and severe visual impairment and blindness.

**Keywords:** Dendritic ulcer, Disciform keratitis, Herpes Simplex Virus, Stromal Keratitis.

**Copyright © 2023 The Author(s):** This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

## INTRODUCTION

Herpes simplex keratitis is the common cause of infectious corneal blindness especially in the developed countries. Approximately 500,000 people in the USA are affected with ocular HSV (Dutt *et al.*, 2016). Prevalence is increasing in the developing countries (Darougar *et al.*, 1985).

There are 2 types of HSV, of which type 1 HSV is responsible for more than 95% of HSV keratitis (Shah *et al.*, 2019). HSV is known for latency after primary infection and reactivation with frequent recurrences resulting in significant corneal scarring and visual impairment. Corneal involvement occurs in 3 major forms; epithelial keratitis, stromal keratitis with or without necrotization and endothelitis (Hill *et al.*, 2014). Previous studies have reported worldwide incidence of 1.5 million with 40,000 new cases of unilateral severe visual impairment or blindness (Whitcher *et al.*, 2001). To the best of our knowledge no similar studies have been conducted in this region of Nepal. The purpose of this study is to determine the clinical pattern of HSV keratitis, precipitating factors and associated visual impairment.

## MATERIALS AND METHODS

This is a retrospective study conducted in Rapti Eye Hospital, a tertiary eye care center in the mid-western region of Nepal. This study followed the international norms and the tenets of the Declaration of Helsinki. Approval for the study was taken from hospital management committee and institutional review committee.

All consecutive cases diagnosed with HSV keratitis in the Cornea department from January to December 2022 were included in the study. Bacterial, fungal, protozoal keratitis and peripheral ulcerative keratitis associated with autoimmune disorders were excluded from the study.

Information regarding age, gender, precipitating factor, presenting visual acuity, intraocular pressure, clinical features and diagnosis was collected from the hospital records. Detailed ocular examination under slit-lamp biomicroscope was performed in each patient including fluorescein staining and corneal sensation. Diagnosis was made clinically.

Cases presenting with branching linear lesion with terminal bulbs were diagnosed with dendritic keratitis. Broad ulcers with scalloped borders were diagnosed as geographic ulcers. Focal, multiple or diffuse stromal infiltration with loss of corneal sensation with or without epithelial defect and ulceration were diagnosed as necrotizing and nonnecrotizing stromal keratitis respectively. Disciform keratitis included cases with disc shaped stromal edema with mild keratic precipitates. Cases with significant stromal edema and marked signs of anterior uveitis were diagnosed as keratouveitis. Persistent epithelial defect with thickened greyish border was diagnosed as neurotrophic ulcer.

Data were collected from the medical records and cleaned in MS-Excel. Statistical analysis was done using SPSS version 20.

## RESULT

A total of 218 cases diagnosed with Herpes Simplex Keratitis in the Cornea department were analyzed. Mean age of the patients was 39.23±20.19 years. Majority of patients belonged to age group 15-40 years, 99 cases (45.4%). Females were affected slightly more than males with ratio of 1.16:1. Age distribution of study participants have been tabulated in Table 1.

**Table 1: Age Distribution of study participants**

Age Group (years)	Frequency	Percent
<15	21	9.6
15-40	99	45.4
41-60	55	25.2
>60	43	19.7
Total	218	100.0

Patients presented with all clinical types of HSV keratitis; epithelial keratitis, stromal keratitis and endothelitis. Majority of patients presented with stromal keratitis, 109 cases (50%) followed by disciform keratitis, 54 (24.8%). Frequency of clinical types of HSV keratitis have been tabulated in table 2.

Diminution of vision was the most common chief complain of cases with stromal keratitis while redness and foreign body sensation was common in epithelial keratitis. Photophobia was complained mostly by patients with keratouveitis.

**Table 2: Clinical types of HSV keratitis among study participants**

Types	Frequency	Percent
Dendritic Keratitis	18	8.3
Disciform Keratitis	54	24.8
Geographical ulcer	2	0.9
Keratouveitis	30	13.8
Neurotrophic keratitis	5	2.3
Stromal Keratitis	109	50.0
Total	218	100.0

Of total 218 cases, most of the patients had spontaneous onset. Other precipitating factors were minor trauma, use of steroid, fever and stress. Precipitating factors are tabulated in table 3. Corneal

sensation was decreased in 171 cases; 78.4%. Mean intraocular pressure was 14.88±5.4. Complication in the form of scarring was present in 20 cases and secondary glaucoma in 2 cases.

**Table 3: Precipitating factors for HSV keratitis among study participants**

	Frequency	Percent
Spontaneous	188	86.2
Fever	8	3.7
UV light	1	.5
Minor trauma	11	5.0
Steroid	10	4.6
Total	218	100.0

According to World Health Organization (WHO) criteria, unilateral blindness was present in 14.2% of cases. Most of the patients presented with mild visual

impairment. Presenting visual acuity has been provided in Table 4.

**Table 4: Presenting Visual Acuity of study participants**

Visual Acuity	Frequency	Percent
6/6-6/18	143	65.6
6/24-6/60	31	14.2
<6/60-3/60	13	6.0
<3/60	31	14.2
Total	218	100.0

## DISCUSSION

HSV is the commonest infective cause of corneal blindness in developed countries, with incidence of 5.9– 20.7 episodes per 100,000 persons per year (Liesegang, 2001; Norn, 1970). Prevalence is rising in the developing countries like Nepal and India probably due to improved eye health services as well as injudicious use of steroid from paramedics. HSV keratitis is often challenging condition due to varying manifestations, subtle signs and recurrences even after proper treatment.

In the current study, mean age of the patients was 39.23±20.19 years which is similar to 41.13±17.14 years reported by Shah *et al.*, and 36.63±16.94 years reported by Chaudhary *et al.* in the similiar studies conducted in Nepal (Chaudhary, 2017; Shah *et al.*, 2019). In our study, most common age group affected was 15-41 occurring in 45.4% of cases which is similar to various previous studies (Chaudhary, 2017; Kabra *et al.*, 2006; Labetoulle *et al.*, 2005; Raju *et al.*, 2011; Shah *et al.*, 2019). As the productive age group is affected by HSV keratitis, associated corneal scarring can have adverse effect in the community.

In our study, stromal keratitis was the most common clinical manifestation occurring in 50% of cases followed by disciform keratitis in 24.8%. Other studies also have reported stromal keratitis as the most common manifestation. Kabra *et al.*, have reported stromal keratitis in 53.64% and epithelial keratitis in 20% of cases (Kabra *et al.*, 2006). Similarly, Shah *et al.*, reported stromal keratitis without ulceration in 51.6%, with ulceration in 7.2%, endothelitis in 21.8% and epithelial keratitis in 17.5% (Shah *et al.*, 2019). Chaudhary *et al.*, reported disciform keratitis as the most common presentation (Chaudhary, 2017). However, some earlier studies have reported epithelial keratitis to be the commonest presentation (Labetoulle *et al.*, 2005; Sinha & Dulani, 2021).

Diminution of vision was commonest presenting complaint among the cases with stromal keratitis and redness and foreign body sensation among epithelial keratitis in our study. This is similar to that reported by Shah *et al.* (Chaudhary, 2017; Shah *et al.*, 2019). However, Darougar *et al.* reported diminution of vision as less common complaint (Darougar *et al.*, 1985). This may be due to lower cases with stromal keratitis in his study. In this study, 14.2% of patients had unilateral blindness (<3/60). Similarly, Chaudhary

*et al.* reported visual acuity of <3/60 in 8.4% of cases (Chaudhary, 2017). This signifies the importance of early diagnosis and proper treatment as the diseases may lead to permanent visual impairment and blindness when neglected.

Limitation of our study is retrospective type and failure to provide data regarding recurrences and outcomes in the follow up visits.

## CONCLUSION

The epidemiology and clinical manifestations of HSV keratitis have been found to vary among different study populations. Productive age group are most commonly affected with HSV keratitis. Stromal keratitis is the most common presentation. HSV keratitis may lead to significant scarring and severe visual impairment and blindness. This study may provide insight about the epidemiology of HSV keratitis, clinical pattern, associated visual impairment and add to data pool available.

**Conflict of Interest:** None

## REFERENCES

- Chaudhary, M. (2017). Clinical and epidemiological profile of herpetic eye disease in a tertiary eye care center. *Journal of Institute of Medicine*, 40(2).
- Darougar, S., Wishart, M. S., & Viswalingam, N. D. (1985). Epidemiological and clinical features of primary herpes simplex virus ocular infection. *British Journal of Ophthalmology*, 69(1), 2–6. <http://dx.doi.org/10.1136/bjo.69.1.2>
- Dutt, S., Acharya, M., Gour, A., Sapra, N., Chauhan, L., & Mathur, U. (2016). Clinical efficacy of oral and topical acyclovir in herpes simplex virus stromal necrotizing keratitis. *Indian Journal of Ophthalmology*, 64(4), 292. doi: 10.4103/0301-4738.182940
- Hill, G. M., Ku, E. S., & Dwarakanathan, S. (2014). Herpes simplex keratitis. *Disease-a-Month*, 60(6), 239–246. <https://doi.org/10.1016/j.disamonth.2014.03.003>
- Kabra, A., Lalitha, P., Mahadevan, K., Prajna, N. V., & Srinivasan, M. (2006). Herpes simplex keratitis and visual impairment: A case series. *Indian Journal of Ophthalmology*, 54(1), 23–27. doi:10.4103/0301-4738.21610

- Labetoulle, M., Auquier, P., Conrad, H., Crochard, A., Daniloski, M., Bouée, S., El Hasnaoui, A., & Colin, J. (2005). Incidence of herpes simplex virus keratitis in France. *Ophthalmology*, *112*(5), 888–895. doi:10.1016/j.ophtha.2004.11.052
- Liesegang, T. J. (2001). Herpes simplex virus epidemiology and ocular importance. *Cornea*, *20*(1), 1–13.
- Norn, M. S. (1970). Dendritic (herpetic) keratitis: I. Incidence—seasonal variations—recurrence rate—visual impairment—therapy. *Acta Ophthalmologica*, *48*(1), 91–107. doi:10.1111/j.1755-3768.1970.tb06577.x
- Raju, K. V., Jyothi, P. T., & SIM, M. (2011). Clinical profile of herpes simplex keratitis. *KSOS J*, *23*(1), 33–36.
- Shah, A., Joshi, P., Bhusal, B., & Subedi, P. (2019). Clinical pattern and visual impairment associated with Herpes simplex keratitis. *Clinical Ophthalmology*, 2211–2215. Doi: 10.2147/opth.s219184
- Sinha, A., & Dulani, S. (2021). Clinical profile of herpes simplex viral keratitis cases attending eye opd in tertiary hospital of Chhattisgarh state. *Indian J. Clin. Exp. Ophthalmol*, *3*, 440–443. DOI: 10.18231/2395-1451.2017.0107
- Whitcher, J. P., Srinivasan, M., & Upadhyay, M. P. (2001). Corneal blindness: A global perspective. *Bulletin of the World Health Organization*, *79*(3), 214–221.

---

**Cite This Article:** Jyoti Sapkota, Santosh Subedi, Sulaxmi Katuwal, Nita Sunam, Suresh BK Rasaily, Om Yadav (2023). Pattern of Herpes Simplex Virus Keratitis at A Tertiary Eye Care Center in Mid-Western Region of Nepal. *East African Scholars J Med Sci*, *6*(2), 30-33.

---