Original article

Ocular manifestations in Herpes Zoster Ophthalmicus

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Abstract

Background: Ocular complications of herpes zoster ophthalmicus (HZO) may lead to substantial visual disability, severe post-herpetic neuralgia and rarely fatal cerebral complications.

Aim: To identify the pattern of ocular manifestation in herpes zoster ophthalmicus.

Materials and methods: A cross-sectional descriptive study was under taken including the clinically diagnosed cases of HZO. All of them underwent a complete ophthalmological evaluation.

Results: Sixty-eight cases of HZO were examined, of which 37 (54.4 %) were male and 31 (45.6%) female. The mean age was 48.7 ± 18.5 years. Most of the patients (64.7 %) were above the age of 40 years. 77.94 % of the patients had some form of ocular involvement. Pain (77.9 %) was the commonest ocular complaint. In young patients less than 35 years, HIV was the most common risk factor (19.3 %).Visual status was good in the majority (73.5 %) of patients at presentation. Lid and adnexal findings (45.8 %) were most common ocular involvement followed by conjunctivitis (41.1 %). Corneal complication was seen in 38.2 % of cases, uveitis in 19.1 % and post-herpetic neuralgia (PHN) and secondary glaucoma each in 5.8 %.

Conclusion: Eyelid and ocular adnexal involvement is most commonly found in patients with herpes zoster ophthalmicus followed by corneal complication and uveitis. There needs to be awareness of ocular involvement, which can be sight threatening, among the HZO patients and other medical departments and an increased emphasis on regular ophthalmic examination.

Key words: herpes virus, herpes zoster, conjunctivitis, keratitis

Introduction

Herpes zoster is a common infection caused by the human herpes virus, a member of the family Herpesviridae (Hutchinson, 1865). Reactivation of the latent virus in neurosensory ganglia produces the characteristic manifestations of herpes zoster, commonly known as shingles. Herpes Zoster Ophthalmicus is a recurrent manifestation of varicella zoster virus infection of the ophthalmic division of the trigeminal nerve which accounts for 10 to 25 % of the initial episodes of herpes zoster infections. Fifty percent of people with HZO will have ocular involvement, and forty percent will have corneal involvement leading to severe pain and a wide spectrum of sight-threatening complications affecting all ocular and orbital tissues (Kestelyn,

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1987). The virus damages the eye and surrounding structures by secondary perineural and intraneural inflammation of sensory nerves (Freedman et al 1987). The ophthalmic division is most commonly involved, and of its further branches, the frontal nerve is most commonly affected (Saikh et al 2002). Vesicles at the side of the tip of the nose are known as Hutchinson's sign and are indicators of future ocular involvement. Nasociliary nerve involvement in HZO is associated with a 76 % chance of ocular complications (Harding, 1993). Immunosuppression, malignancies, chemotherapy, tuberculosis, trauma and aging greatly increase a patient's risk for reactivation of the latent vericella. HZO is usually preceded by neuralgic pain, headaches, nausea and vomiting.

Patients with herpes zoster ophthalmicus commonly experience ocular complications, which may vary considerably ranging from self-limited mucoid conjunctivitis and dendritic corneal epithelial lesions to more destructive complications, including scleritis, stromal keratitis, uveitis, and glaucoma. Ocular complications occur in 50 % – 89 % of patients with HZO; these complications lead to substantial visual disability and severe post herpetic neuralgia (Zaal et al 2003). Without antiviral therapy, half of the patients with HZO will develop eye disorders such as conjunctivitis, keratitis and uveitis, some of which are potentially sight threatening (Burgoon & Burgoon, 1957).

The incidence of herpes zoster is likely to increase in the near future because of the escalating number of elderly and immunocompromised people. Complications associated with varicella have a high financial and social burden. Ophthalmic zoster has been considered the most important and potentially serious of all sites for herpes zoster (Ostler, 1976).

The ocular complications seen in HZO if detected at an early stage and managed properly can be helpful to prevent or minimize potential visual damage. The purpose of this study was to identify the pattern of ocular manifestations in herpes zoster ophthalmicus.

Materials and methods

A hospital-based cross sectional study was carried out in 2006 - 007. Detailed history was taken from the patient or patient's attendants whenever it was not possible to obtain the history from the patient directly. The profile of the patient including age, gender and occupation was taken down. Chief complaints, ocular and systemic, if any, were also asked about. A detailed history of the presenting illness and other relevant associated symptoms were documented. The presence of any known risk factors such as diabetes, HIV infection, tuberculosis, immunosuppressive treatment and pregnancy was also included.

Ocular examination included visual acuity assessment, ocular motility assessment, eyelid and adnexal examination, conjunctival and scleral examination, examination of the cornea and of the anterior and posterior segments. The visual acuity was taken by Snellen chart and was recorded in snellen fraction. Ocular motility was tested with a torch light in cardinal gazes. A detailed orthoptics examination including Hess charting and diplopia charting was also carried out in suspected cases of muscle palsy. Intra ocular pressure (IOP) was measured by non-contact air Puff tonometer.

Statistics: Data were entered in computer database for statistical analysis. The SPSS 14.0 version software was used for the purpose of analysis.

Results

A total of 68 cases were included in the study in the study period. 37 (54.4 %) were male and 31 (45.6 %) were female. The maximum number of patients, 14 (20.6 %), were in the age group of 41 to 50 years. There were 30 (44.16 %) patients above the age of 50 years, the eldest patients being 86 years of age. The mean age of the patients was 48.78 ± 18.53 years. The ocular symptoms with which the patients visited the hospital are given in Table 1.

Table 1

Ocular symptoms on presentation to the hospital

Symptoms	Number	Percentage
Pain	53	77.94
Foreign body sensation, Watering	41	60.29
Redness, Discharge	28	41.17
Lid Swelling	27	39.7
Diminution of vision	20	29.41
Burning pain	16	23.52

Pain in and around eye, foreign body sensation and redness were the most frequent complaints with which patients presented to the hospital. History taking revealed that majority, 45 (63.2 %), of the patients gave positive history of chickenpox. The occurrence of other risk factors presented in the patients is given in table 2.

Manifestations	No. of cases	Percentage
Lid and adnexae involvement	31	45.58
Conjunctivitis	28	41.17
Episcleritis	2	2.94
Scleritis	2	2.94
Keratitis	26	38.23
Uveitis	13	19.11
Secondary glaucoma	4	5.88
Post-herpetic neuralgia	4	5.88
Sixth nerve palsy	1	1.47
Total	68	100

Table 2

Distribution of Patient according to associated risk factors

Risk factor	No. of cases	Percentage
Diabetes mellitus	12	46.16
Hiv	5	19.32
Tuberculosis	3	11.53
Malignancy	1	3.84
Lactation	1	3.84
Immunosuppressive medications	2	7.69
Alcoholic liver disease	1	3.84
Meningitis	1	3.84
Total	26	100.0

The history revealed that the high associations in the patients were diabetes mellitus, HIV, tuberculosis and malignancy. The visual acuity in the affected eye was categorized into 20/20 - 20/60, < 20/60 - 20/200, < 20/200 - 20/400 and < 20/400. The numbers of eyes with the visual acuity in the different ranges are given in table 3.

Table 3

Patient distribution according to the visual acuity of the involved eye on presentation

Visual Acuity	No. of cases	Percentage
20/20 - 20/60	50	73.52
< 20/60 - 20/200	12	17.64
< 20/200 - 20/400	5	7.35
< 20/400	1	1.47
Total	68	100

Table 4

Patient distribution according to different ophthalmic manifestations

It was found that 77.94 % of the patients had some form of ocular involvement. The ocular findings from the patients according to their occurrence are given in table 5. It was seen that many patients had multiple features on presentation.

Table5

Eyelid and adnexal findings

41 % of the study population had conjunctivitis whereas the majority of the patients (59 %) did not have it. Two (2.94 %) patients had episcleritis and scleritis each. As vericella zoster is epitheliotropic as well as neurotropic, the cornea is one of the frequently and severely affected parts of the eye. The corneal findings are given in table 6.

Table 6

Patient distribution according to corneal involvement

Thirteen (19.11 %) patients out of 68 had uveitis. 12 (92.30 %) patients had anterior uveitis and 1 (7.69 %) had intermediate uveitis. There was no case of posterior or panuveitis. The majority (79.4 %) of the patients had IOP between10 - 21 mmHg. Four (5.88 %) patients had IOP e" 21 mmHg.

Table 7

Patient distribution according to the dermatome involvement

Dermatome	No. of cases	Percent (%)
Frontal nerve	39	57.35
Nasociliary nerve	24	35.29
Lacrimal nerve	11	16.17

The majority of the patients, 39 (57.35 %), had frontal nerve involvement followed by 24 (35.29 %) patients with nasociliary involvement and 11(16.17 %) patients with lacrimal nerve involvement. 24 patients with nasociliary nerve involvement presented with Hutchinson sign. There was more than one dermatome involvement in several cases.

Table 8

Patient distribution according to additional dermatomal involvement

A total of 4 (5.88 %) patients had additional trigeminal branch involvement. Three (4.4 %) patients had maxillary nerve involvement and 1 (1.47 %) patient had mandibular branch involvement.

Discussion

Herpes zoster ophthalmicus is a recurrent manifestation of the varicella zoster virus infection of the ophthalmic division of the trigeminal nerve which accounts for 10 to 25 % of the initial episodes of dermatomal herpes zoster infections. Fifty percent of people with herpes zoster ophthalmicus may have ocular involvement, and forty percent may have corneal involvement that might lead to severe pain and a wide spectrum of sight-threatening complications affecting all ocular and orbital tissues (Hutchinson, 1865).

Ocular signs and symptoms often accompany the characteristic rash, ranging from self-limited mucoid conjunctivitis and dendritic corneal epithelial lesions to more destructive complications, including scleritis, stromal keratitis, uveitis, and glaucoma. Virtually any tissue level within the globe may be involved, and rarer complications include retinal necrosis, optic neuritis, and extra ocular muscle palsies (Cobo et al 1986).

A total number of 68 cases of herpes zoster ophthalmicus were included in the study and examined for different ocular involvement. In the current study, the most common presenting symptom was pain, seen in 77.94 % of the study population. This is similar to the findings observed by Cobo et al where pain was the most common presenting symptoms accounting for 70 percent of their patients (Cobo et al 1986). Other symptoms like foreign body sensation and watering were seen in 60.29 % of our patients. Diminution of vision was present in 29.41 %. This figure closely correlates with the study conducted by Zaal et al (2003) where mild to moderate visual loss was found in 23 % of the cases (Sriprakash et al 2004). This is due to a variety of transient inflammatory reactions within the anterior segment of the involved side.

The major predisposing factors noted in the patients were diabetes (17.64 %), HIV (7.35 %), and tuberculosis (4.4 %). In the study conducted by Kaiserman et al (2005), 25.2 % of the patients with diabetes had herpetic eye disease in comparison to 16.6 % non-diabetics, thus leading to the conclusion that herpetic eye disease was more common in diabetics (Cobo et al 1986). HIV positivity is associated with significant risk of herpes zoster ophthalmicus in the young age group. In our study, all the HIV positive cases were less than 35 years of age. In study by Sriprakash KS et al (2004), zoster ophthalmicus was the second most common ocular manifestation accounting for 10.28 % of the HIV positive cases (Kaiserman et al 2005). In our study, the figure is less probably due to the small sample size. In our study, herpes zoster ophthalmicus was present in 2.94 % of patients taking immunosuppressive drugs, 1.47 % of patients with alcoholic liver disease, in 1.47 % of patients with meningo-encephalitis and in 4.41 % of patients with tuberculosis. Freedman MS et al have reported a case of herpes zoster ophthalmicus associated with delayed cerebral infarction and meningoencephalitis (Edgerton, 1945). Kestelyn et al (1987) have reported two cases of herpes zoster ophthalmicus receiving immunosuppressive drugs (chemotherapy) for malignancy.

In the present study, the visual acuity at presentation was fairly good. 91.6 % of the cases had a vision better than 20/200 in the involved eye. This figure is close to the study by Zaal et al (2003) where 96 % patients had vision better than 20/200. In our study, there were 27 % cases with vision < 20/60 where as in the study carried out by Suasan Lewallen (1994), 60 % cases had vision < 20/60. These results are similar to our findings. In our study, 77.94 % of the study population had ocular manifestation. There were patients with one or more than one ocular manifestation. In the study carried out by Samson Bayu et al, 75 % of the study population had ocular involvement which closely correlates with our study (Hoang-Xuan et al 1992).

In our study, 45.58 % of the study population had lid and adnexal findings. According to study carried out by Cobo LM et al, 51 % of the patients had eyelid lesions concluding that eyelids are commonly involved structure in herpes zoster ophthalmicus. [14]

Conjunctivitis is one of the most common manifestations of herpes zoster ophthalmicus. The conjunctiva appears injected and edematous, often with petechial hemorrhages. In the present study, 41.17 % (n = 28) patients had conjunctivitis. In the study conducted by Hoang-Xuan T et al, 54 % patients had conjunctivitis (Lewallen, 1994.)

In the present study, 2.94 % (n=2) of the study population had episcleritis and the same number had scleritis. In the study carried out by Larry W et al, 1.16 % of the study population had episcleritis (*Zaal et al 2003)*.

In the present study, 26 (38.23 %) patients had corneal involvement. The most common corneal finding was punctate epithelial keratitis followed by anterior stromal keratitis and dendritiform keratitis. The other corneal findings were disciform keratitis and geographic ulcer. In the study conducted by Hoang-Xuan T et al, the corneal involvement was seen in 36.36 % of the cases (Lewallen, 1994). Punctate epithelial keratitis was seen in 39 % of the cases, dendritic keratitis was seen in 11 % cases, disciform keratitis was seen in 13 % of the cases, dendritic ulcer was seen in 5 % cases. These findings are which are very similar to those of the present study.

In the present study, 19.11 % of the study population had uveitis. Anterior uveitis was the most common, seen in 92.30 % and intermediate uveitis in 7.69 % of the patients. There was no case of posterior or panuveitis. In the study carried out by Hoang-Xuan T et al, uveitis was seen in 17 % of the cases (Lewallen, 1994). In the study conducted by Samson Bayu et al, 50 % of the cases presented with anterior uveitis (Hoang-Xuan et al 1992).

In our study, 5.88 % of the study population had secondary glaucoma and 5.88 % had post-herpetic neuralgia. HIV retinopathy and 6th nerve palsy were present in 1.47 % of patients each. A total of 10 patients had other findings accounting for 14.70 % of the total cases. HIV retinopathy and 6th nerve palsy were present in HIV positive cases. In the study carried out by Hoang-Xuan T et al (1992), 7% of the cases had secondary glaucoma [19] and 11.62 % in the study done by Womack et al (1983).

In this study, the commonest branch of the trigeminal nerve to be involved was the frontal nerve, seen in 57.35 % of the study population followed by 35.29 % of patients with nasociliary involvement and 16.17 % of patients with lacrimal nerve involvement. The study carried out by Hoang-Xuan T et al (1992) also had the largest number of frontal nerve involvement (94 %) followed by lacrimal nerve (59 %) and nasociliary nerve involvement (35 %) (Lewallen, 1994).

Conclusion

Eyelid and ocular adnexal involvement is most commonly found in patients with herpes zoster ophthalmicus followed by corneal complication and uveitis. Routine referral system of the HZO infected cases from other allied medical and surgical departments for ophthalmic check up is strongly recommended.

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