

Review article

Evaluation of Hutchinson's sign in HIV associated herpes zoster ophthalmicus

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Abstract: A prospective study of 100 serial HIV infected herpes zoster ophthalmicus patients, was done from December 1993 to June 1995, to determine the correlation between Hutchinson's sign and ocular involvement. A mean age of 35.2 ± 10.7 years and a male to female ratio of 2.22 to 1 was found. Ocular complications resulted in 78% of the patients. The sensitivity, specificity, accuracy, positive and negative predictive value of the sign in detecting ocular involvement is 74%, 68%, 73%, 89% and 43% respectively. An H.Z.O. patient with Hutchinson's sign is 2.33 times likely to have ocular involvement. However in areas where HIV associated H.Z.O. is highly prevalent, Hutchinson's sign is not a reliable predictor of ocular involvement; therefore, it should be used with prudence. A future study on adequate number of patients is also recommended. [*Ethiop. J. Health Dev.* 1997;11(3):295-298]

Introduction

Herpes zoster ophthalmicus (H.Z.O.) is a maculopapular rash on the dermatomal distribution of the ophthalmic division of the trigeminal nerve which is said to be due to reactivation of Varicellazoster virus (1). H.Z.O. was the 2nd common cause of attendance at a neuro-ophthalmic clinic in an Ethiopian tertiary eye care centre (2). It is recognized as an early clinical marker of HIV infection (3, 4). A prospective study on Ethiopian H.Z.O. patients revealed 95.3% seropositivity to HIV infections (5). H.Z.O. affects all layers of the eye. Ocular complications occur in 50-89 % of patients (3, 5, 6, 7). The incidence and severity of ocular complications and post herpetic neuralgia is markedly increased in HIV infected patients with H.Z.O. (3, 4, 5).

Hutchinson in 1885 observed that ocular involvement was much more common in patients who had zoster involvement of the nasociliary branch which is manifested by cutaneous involvement on the *side of the tip of the nose* (8). Hutchinson's sign is convenient, and applicable early during the eruption phase.

A recent study, in 1987, also showed statistical association of nasociliary nerve involvement with subsequent ocular disease (7). Oral acyclovir, especially if given in the first 72 hours, protects against ocular complications (9).

The purpose of this study is to evaluate Hutchinson's sign as a diagnostic test for screening of ocular involvement in HIV associated H.Z.O.. Early detection of H.Z.O. patients at risk for the development of ocular involvement is important, so that antiviral (acyclovir) would be used early in the course of the illness. The efficient utilization of antiviral is of paramount importance in developing countries where its use is limited due to unavailability of the drug and its costliness.

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Methods

A prospective case series study of 100 consecutive Ethiopian H.Z.O. patients attending the eye department of Menelik II hospital, from December 1993 to June 1995, who are seropositive to HIV

infection by double ELISA technique using first generation Welcozyme kits, which were replaced by second generation kits (Welcome diagnostics, Dartford, England) were studied. Serologic examination to HIV infection was done following verbal informed consent. Repeat ELISA positive patients were considered to have HIV infection. This is in accord with 64% and 94.2% specificity of the ELISA test in the low risk Ethiopian population for the first and second generation Welcozyme kits respectively (10). Counselling of the patients was done based on the serologic result. The patients were examined by the two authors separately. Age, sex, right or left dermatomal distribution, presence or absence of ocular involvement and Hutchinson's sign was recorded in each patient. Patients were followed for a minimum period of three months.

H.Z.O. was defined as a maculopapular rash which leaves a scar on the dermatomal distribution of the ophthalmic division of the trigeminal nerve.

Hutchinson's sign was defined as cutaneous involvement of zoster rash or scar on the *side of the tip of the nose*.

Ocular involvement was defined as abnormalities in the globe due to H.Z.O. which is detected by detailed ocular examination using slit lamp biomicroscope and ophthalmoscope. It was done by a senior ophthalmologist and taken as a standard for evaluation.

The sensitivity, specificity, accuracy, positive and negative predictive value of Hutchinson's sign as a marker of ocular involvement is calculated. The pre test likelihood (ocular complications prevalence), post test likelihood and the likelihood ratio when Hutchinson's sign is present or absent is analyzed as reviewed in literatures (11).

Results

The age and sex distribution of the patients are as seen in Table 1. The age ranges from 18 to 70 years with a mean age of 35.2 ± 10.7 years. Eighty four percent of the patients were aged 45 years or less. Males constitute 69 % of the patients (male: female is 2.2 to 1). Right eye was involved in 48 patients and left eye in 52 patients. There was no bilateral involvement or systemic zoster seen.

Table 1: **Age and Sex distribution of HIV infected H.Z.O. patients**

Age	Male	Female	Total
15-19	--	1	1
20-24	7	8	15
25-29	10	8	18
30-34	14	3	17
35-39	19	4	23
40-44	5	2	7
45-49	5	2	7
50-54	4	-	4
55-59	3	2	5
≥ 60	2	1	3
Total	69	31	100

As seen in Table 2, the prevalence of ocular involvement is 78%. Corneal complications, anterior uveitis, secondary glaucoma and scleral involvement constitute the majority of ocular involvement. The sensitivity, specificity, accuracy, positive and negative predictive value of

Hutchinson's sign in detecting ocular involvement is 74%, 68%, 73%, 89%, and 43% respectively.

Table 2: **The correlation of Hutchinson is sign and ocular involvement**

	ocular involvement	
	Present	Absent
Hutchinson' s		
present	58%	7%
Absent	20%	15 %
Total	78%	22 %
Hutchinson' s	58%	7 %

Sensitivity= 74.35 % Post test likelihood
 Specificity= 68.18% if (+)= 89 %
 Accuracy= 73 % if (-)= 57 %
 Pre test likelihood= 78% Likelihood ratio= 2.33
 Positive predictive value= 89% Negative predictive value= 43%

Discussion

In the pre HIV period, H.Z.O. was said to be the disease of the elderly and the aged are particularly susceptible for its development (1). Various studies showed the mean age to be in the sixties (6,7, 12). After the HIV pandemic, the pattern changed and HIV related H.Z.O. developed in the younger age groups with a mean age ranging from 28-34 years (3, 4). The mean age in our series is 35 years which is in agreement with the above studies and nearer to the mean age of Ethiopian AIDS patients of 30 years (13).

The presence or absence of gender predilection for the acquisition of H.Z.O. is still in debate. Some studies have shown female preponderance (6, 7, 12) and others contend that there is no sexual predilection (1). These studies were undertaken prior to the HIV era. The male to female ratio in our series is 2.2 to 1. A recent report of AIDS cases in Ethiopia showed a male to female ratio of 1.6 to 1 (13). This might be due to a difference in utilization of health institution favouring males; as is also seen in other neuro-ophthalmic patients (2).

Studies in pre HIV era showed ocular complications ranging from 50-71% (6, 7, 12). The prevalence of ocular complications seen in our HIV infected H.Z.O. patients is markedly increased (78%). An African study in HIV infected young individuals showed 89% incidence of ocular complications (3) which is slightly greater than in our series.

The positive predictive value of Hutchinson's sign reported ranges from 76-85% (7, 14). In our series of patients, the likelihood of ocular complications in patients with the sign rise from 78% to 89%. In its absence it falls to 57 %. Thus, an H.Z.O. patient with the sign is 2.33 times likely to have ocular involvement than without. An absence of Hutchinson's sign is 2.66 times likely to be seen in patients without ocular involvement.

Hutchinson's sign can be observed easily by all health workers early in the course of the illness. Based on our finding, it gives a clue to the increased risk of subsequent ocular involvement. On the contrary, absence of Hutchinson's sign occur in one-fourth of the patients with ocular involvement. In accord with the reported literature, our study substantiates that Hutchinson's sign alone is not a reliable predictor of ocular involvement (8) and severe ocular complications may occur even in patients with slight rash anywhere in the forehead (10, 15). This would worsen in HIV related H.Z.O. Thus, in areas where HIV associated H.Z.O is highly prevalent, Hutchinson's sign should be used with caution. A future study on a large number of patients is also recommended.

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References

1. Karabassi M, Raizman MB, Schuman JS. Herpes zoster ophthalmicus. *Surv ophthalmol* 1992;36:395-410.
2. Samson B, Wondu A. Pattern of neuro-ophthalmic disorders in a tertiary eye care centre. In *Addis Ababa Ethiop Med J.* 1997;35:43-51.
3. Kestelyn P, Stevens AM, Bakkers E, Rouvray D, De-Perre UP. Severe herpes zoster ophthalmicus in young African adults: a marker for HTLV-III seropositivity. *Br J Ophthalmol* 1987;71:806-809.
4. Sandor EV, Millman A, Croxson TS, Mildvan D. Herpes zoster ophthalmicus in patients at risk for the acquired immune deficiency syndrome (AIDS). *Am J Ophthalmol* 1986;101:153-5.
5. Samson B, Wondu A. Clinical profile of herpes zoster ophthalmicus in Ethiopians. *Clin Infect Dis* 1997;24:125601260.
6. Womack LW, Liesegang T. Complications of herpes zoster ophthalmicus. *Arch Ophthalmol* 1983;101:42-45.
7. Harding S, Lepton J, Wells CD. Natural history of herpes zoster ophthalmicus: predictors of post herpetic neuralgia and ocular involvement. *Br J Ophthalmol* 1987;71:353-358.
8. De-Luise V, Wilson II FM. Varicella and Herpes zoster ophthalmicus. In: Duane T, Jaeger EA editors. *Clinical ophthalmology*, Philadelphia: J.B. Lippincott, 1988: vol.4 chap.20;p 1-20.
9. Cobo LM, Foulks GN, Liesegang T, Lass J, Sutpin JE, Wilhelmus K, *et.al.* Oral acyclovir in the therapy of acute herpes zoster ophthalmicus. *Ophthalmology* 1986;93:763-770.
10. Tsehaynesh M and Debrework Z. Comparison of two generations of Wellcozyme kits. *Ethiop J Health Dev* 1990;4:207-211.
11. The Department of Clinical Epidemiology and Biostatistics, McMaster University Health Sciences Centre. How to read clinical journals: II. To learn about a diagnostic test. *Can Med Assoc J* 1981;124:703-710.
12. Marsh RJ, Cooper M. Ophthalmic herpes zoster. *EYE* 1993;7(3):350-370.
13. National HIV/AIDS Update. AIDS/STD control program. Ministry of Health, Addis Ababa. *Ethiop J Health Dev* 1995;9:63-66.
14. Liesegang TJ. Corneal complications from herpes zoster ophthalmicus. *Ophthalmology* 1985;92:316-324.
15. Kanski JJ. *Clinical ophthalmology*. 2nd ed. London, Butterworth-Heinemann, p.101-105, 1989.