A clinico-epidemiological study of herpes zoster

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Abstract

This is a report of a study of 200 herpes zoster patients, conducted in the Central Province of Sri Lanka, over a period of 31 months. Incidence in males was twice that in females and the majority affected were in the 16 to 60 age group. A relatively high incidence was noted during the first half of the period under study. Thoracic dermatomes were most commonly affected. A significant finding was that post-herpetic neuralgia occurred in those who reported late for treatment. The possibility of spread of varicella zoster virus from cases with chicken-pox as well as herpes zoster was evident.

Key words: Epidemiology; herpes zoster

Introduction

Herpes zoster (HZ) is characterised by the development of a localized, grouped vesicular skin eruption confined to one or more dermatomes, preceded by pain. It is caused by the varicella-zoster virus (VIZ). The current concept as regards the development of the lesion is that postulated by Hope-Simpson (1) in 1965 which infers that primary infection presents as chicken-pox (CP), and HZ is a reactivation of the latent virus established in one or more sensory-root ganglia during the primary infection. Although the level of humoral and/or cellular immunity depreciating to a critical level has been considered to play a vital role in the reactivation of the latent virus, the exact factors determining when and who would develop HZ is still not clear. Transplacental infection of the foetus (2) and fresh exposure to the virus causing clustering of cases have also been reported (3). HZ is of universal distribution and could occur at any age, but has been observed to be rare in the young and to be common in the elderly.

There is no recorded study of a series of patients with HZ from Sri Lanka. Three studies done over 25 years ago (4,5,6) reported the relationship of HZ to CP. The objective of the present study was to determine the age, sex, dermatomal distribution and sequence of appearance of the lesions, their relationship to a past history of CP and to ascertain seasonal variation in the incidence, if any. Further, the effect of a standard analgesic regime on the incidence of post-herpetic neuralgia was evaluated.

Patients and Methods

The study included all patients with HZ who attended a private skin clinic during the period from June 1986 to June 1989. During this period the investigator (GAK) was not available for two periods of 3 months each. As a result data was collected over a period of 31 months.

The clinic served chiefly the middle social class in the Central Province of Sri Lanka. The patients were diagnosed by the typical history of pain and development of localised grouped vesicular lesions. At the first visit the patient was enlightened on the nature of the illness, and the nature of the dreaded and hopeless complication of post-herpetic neuralgia. Each patient was told quite emphatically that the doctor and the patient should strive to abolish the pain totally, with analgesics and, if necessary, with frequent alterations in the regime. The purpose of the study was explained to each patient and informed consent for participation in the study was obtained.

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The severity of pain was measured by a one to five point scale; 1 – no pain, 2 – mild pain, 3 – moderate pain, but not severe enough to disturb sleep, 4 – severe pain leading to sleep disturbance, 5 – very severe and unbearable pain.

The following data were recorded at the first visit: 1. age, 2. sex, 3. dermatomal distribution of lesions, 4. duration of illness at first visit, 5. pain score, 6. past history of infection with CP, 7. evidence of recent exposure to CP, and or HZ and, 8. Sequence of evolution of skin lesions within the dermatome, and 9. evidence of any other physical or mental disorder presently or during the past three months. The cases were reviewed on the fifth, tenth, and thirtieth day from the first visit. The treatment regime was rest at home, sedation at bedtime, analgesics and 1:8000 potassium permanganate soaks topically. The dose of analgesics and sedation was altered at review according to the pain score. At each visit the patient was reminded that the principal objective of the management was to keep them as pain-free as possible during the acute stage of the illness.

The duration of illness was determined by regarding the day the skin changes were first noticed by the patient as the onset.

The data were computer-processed at the department of Community Medicine.

Results

A total of 200 HZ patients were seen during the 31 months. This corresponded to an annual rate of 4.5 per thousand persons reporting for dermatological problems. There were 135 (67.5%) males and 65 (32.5%) females.

The distribution of HZ patients by age showed that the majority affected are in the age range 16 to 45 years for males, while in the females the age range is 16 to 60 years (Table 1). Thirteen

Table 1 – Distribution of patients by age & gender

Age group	Sex				Total	%
	M	%	F	%		
0 – 5	0	0	1	1.5	1	0.5
6 – 10	1	0.7	4	6.1	5	2.5
11 – 15	5	3.7	2	3.0	7	3.5
16 – 20	16	11.9	6	9.2	22	11.0
21 – 25	26	19.3	7	10.8	33	16.5
26 – 30	21	15.6	5	7.7	26	13.0
31 – 35	16	11.9	5	7.7	21	10.5
36 – 40	8	5.9	6	9.2	14	7.0
41 – 45	8	5.9	4	6.1	12	6.0
46 – 50	7	5.2	5	7.7	12	6.0
51 – 55	5	3.7	6	9.2	11	5.5
56 – 60	7	5.2	5	7.7	12	6.0
61 – 65	3	2.2	2	3.0	5	2.5
66 – 70	3	2.2	3	4.6	6	3.0
71 – 75	3	2.2	0	0	3	1.5
76 – 80	5	3.7	3	4.6	8	4.0
81 – 85	1	0.7	1	1.5	2	1.0
Total	135		65		200	

were under 16 years of age, the youngest in the series being a 5 year old girl.

The attendance of HZ patients varied from 1 to 13 per month (Table 2). The average attendance of patients per month ranged from 5.1 in 1986 to 8.7 in 1987. This appeared to show an epidemic pattern every other year.

The average attendance by month during the study period varied from 4.3 in November to 8.3 in June (Table 2). A relatively high incidence occurred in the months of January, March, May and June.

The dermatomal distribution of the lesions is given in Table 3. The commonest site was thoracic (64%) while sacral and cervical sites were the least involved. In addition to the dermatomal distribution of the HZ lesions, one of the patients in the series had typical varicella vesicles scattered sparsely all over the body. Yet another showed vesicles distributed over the left half of the forehead in addition to the involvement of the left 11th thoracic dermatome.

Eighty five percent of the sample sought treatment within the first week of illness, while 10.5% reported during the second week and the balance much later.

Table 2 – Attendance by year and month

	1986	1987	1988	1989	average per month
January	–	8	8	10	8.3
February	–	6	6	5	5.6
March	–	7	4	13	8.0
April	–	8	2	5	5.0
May	–	6	7	8	7.0
June	10	–	–	5	7.5
July	5	–	–	–	5.0
August	6	–	–	–	6.0
September	6	3	8	–	5.3
October	7	9	5	–	7.3
November	1	9	3	–	4.3
December	1	11	8	–	6.6
Average a month	5.1	7.4	5.7	7.7	

Table 3 – Dermatomal distribution of the lesions

	Number of patients	%
Cranial	25	12.5
Cervical	13	6.5
Thoracic	128	64.0
Lumbar	20	10.0
Sacral	14	7.0

There were 15 (7.5%) patients who did not experience any pain, 17 (8.5%) had very severe pain and none of the six children under 10 years experienced severe pain. Mild to moderate pain was reported by 58 (29%) and 59 (29.5%) respectively, while 51 (25.5%) had severe pain.

The incidence of post-herpetic neuralgia, where the patients had residual pain after one month from the onset of the illness, was 5.5% (11 patients). Of them, the youngest was a 22-year old female and the oldest a 72-year old male, 7 being over 40 years of age. One of them was an immuno-compromised patient who was on high doses of steroids. Five of them had cranial lesions while the other six had thoracic lesions. Another noteworthy feature was that 9 out of the 11 patients reported for treatment as late as the twenty first day from onset.

The pattern of evolution was known with certainty only in 144. Of them 52 (45.6%) noticed the initial lesions appearing in the proximal part of the dermatome and spreading to the distal area, while 40 (35.1%) noticed them initially in the distal part of the dermatome. The remaining 22 (19.3%) observed the lesions first in an area midway and spreading proximally and distally.

Of the 200 patients only 159 were able to recollect a positive or negative history of CP. Of these, only 91 (57.2%) gave a history of CP while the balance 68 (42.8%) did not have clinically obvious CP prior to the present illness. Only 5 out of 13 children under 16 years of age had an infection of CP. Eight patients in the series gave a definite recent history of contact with CP, the time interval between exposure and onset of HZ ranging from 2 weeks to 3 months. Two did not have clinically evident CP in the past. A 60-year old lady, with a positive past history of CP, had exposure to her grandchild who had CP 4 weeks earlier, and to her daughter-in-law who had HZ 3 months earlier, living in the same house. Four in the series gave a recent history of contact with HZ. The time interval between exposure and the onset of HZ ranged from 3 weeks to 3 months. It is noteworthy that one of the patients in the series had close contact with another in the series, occupying the same residence, 3 weeks prior to the onset of HZ. This patient was uncertain about primary varicella infection in the past. It is also interesting to note that one patient infected 3 of his family members with CP within 2 weeks after the onset of his illness.

Only 2 patients had noteworthy physical or mental stress, or illness, during or within three months prior to the onset of HZ. Of these 2, a 49-year old lady had polymyositis diagnosed by the neurophysician 6 months earlier and was on prednisolone 60 mg and cimetidine 600 mg daily. The other, a 52-year old housewife, was going through a period of anxiety in anticipation of abdominal hysterectomy which she was to undergo in one month.

Discussion

In the present study, the occurrence of HZ in males was twice that in the females. This was in contrast to the usual pattern of attendance at this skin clinic where 55% were males and 45% were females. Such a gender difference in the occurrence of HZ has not been reported in previous studies (1,7).

HZ is described as commonly occurring in the elderly and the immuno-compromised (2,8), and the incidence is said to increase with age. Our series showed a distinctly different pattern, in that the number of cases rose from age 16 years onwards, for both genders, involving more males in the younger age group, the active sector of the population. However, the British survey in 1965 (1) and the Rochester study from the USA in 1982 (7) highlight a steady increase with age into adult life and a marked increase in the incidence after the age of 50 years. A factor which needs to be stressed is that, in Sri Lanka, a large portion of the population structure is formed by the age group 16-45 years. This is in contrast to the higher proportion of elderly individuals in developed countries. This is a likely explanation for the difference in the age distribution observed in our study. It could also be due to the fact that the immuno-compromised population, due to HIV infection, bone marrow transplants or lymphoreticular malignancies is very low in Sri Lanka. In our

series we had only one immuno-compromised patient.

Further, Hope-Simpson (1) and Ragozzino et al (7) believed that HZ is classically associated with physical stress. In our series, except for two individuals, the others were in good physical and mental health.

Although the average attendance of patients per year for the period of study appeared to show an epidemic pattern every other year, definite conclusions cannot be drawn owing to the small numbers seen per year. A series of 192 patients reported by Hope-Simpson (1) over a period of 16 years did not show an epidemic pattern or seasonal variation.

The present study, in a tropical country, showed the incidence of HZ to be relatively higher during the first half of the year, although no such seasonal variation has been observed in the temperate climates (9). CP however, is known to occur as seasonal outbreaks worldwide (6). Data on CP available in Sri Lanka from 1977 to 1982 (10) shows a seasonal pattern in that the incidence was highest during the first three months of each year (Table 4).

A universal uniformity regarding the dermatomal distribution of the skin lesions has been reported (11). Our study conforms to this pattern with a high incidence in the thoracic region. Why there should be selective preference to the dorsal ganglia of the thoracic nerves for the VZV to lie dormant, or selective reactivation of VZV in thoracic nerves remains to be explained. The appearance of disseminated lesions in patients with HZ, as seen in two patients, is not uncommon. Weller observed a degree of generalization in 33% of his patients (9). He postulates that the viraemia which accompanies the ganglionic replication of the virus due to reactivation accounts for this generalization.

Nearly 60% experienced mild to moderate pain. It is interesting to note that 7% did not experience any pain at all.

Occurrence of post-herpetic neuralgia in those reporting for treatment late, was a significant finding. Nearly 15% of the series reported for treatment one week or more after the onset of the illness. This delay was due to the traditional belief in the community that this eruption results from contact with a reptile toxin. The initial consultation is therefore sometimes with an indigenous snake-bite physician. The other noteworthy feature was that only 5.5% developed post-herpetic neuralgia with our treatment regime. We firmly believe that, if the patient presents early for treatment, and continues to take adequate doses of analgesics measured against the pain score on a regular basis, the development of dreaded post-herpetic neuralgia could be prevented. The low incidence of post-herpetic neuralgia in this series could be attributed to the following factors:

Table 4 – Incidence of CP from 1977 to 1982 (from reference No. 10)

Year	1st quarter	2nd quarter	3rd quarter	4th quarter
1977	304	193	160	140
1978	286	229	231	238
1979	385	292	148	153
1980	293	173	153	93
1981	169	128	88	86
1982	165	103	53	39
Total	1602	1118	833	749

1. A standard, and convenient, analgesic regime prescribed in relation to the pain score of the individual patient;
2. Complete compliance in taking the analgesics, which resulted in the patient remaining completely pain-free during the initial two weeks of follow-up.
3. Presence of only one immuno-compromised patient in the series who was on high doses of steroids.
4. The younger age group involved.

Although the pattern of evolution of the lesions has been described as proximal to distal (12), no uniform pattern of evolution can be inferred from the present series.

HZ is said to occur as a secondary phenomenon due to reactivation of the latent VZV in a person already exposed to the virus. Nevertheless, in this series, 42% of those who could recollect a history of CP had not had clinically obvious CP. Even among the 13 patients under 16 years of age, only 5 gave a definite history of CP. It could be that they had a very mild or latent infection of varicella which may not have been noticed by the parents.

It has been said that there is rarely any evidence of HZ occurring as a result of known exposure to CP or another case of HZ (11). Yet, the possibility of HZ being provoked by exogenous re-exposure to VZV has been documented by Berlin & Campbell (13) in 1970, and Palmer et al (3) in their account of a 'cluster' of cases in a workplace in 1985. The present study corroborates this evidence. In the reports of two cases, the contacts were living in the same residence. Temporal relationship, and possible dermal transmission of the virus as a cause of HZ, have been documented by Thomas & Robertson (14) in 1971. Infection of 3 family members with CP by a patient with HZ, as in the present series, has also been documented in two previous studies (14.5).

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