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Original Article

# Herpes zoster: seasonal variations and morphological patterns in Pakistan

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**Abstract**

***Objective*** To determine the relevance of seasonal variations and pattern of herpes zoster among the labor community in Lahore.

***Patients and methods*** This observational, cross sectional study was conducted at Nawaz Sharif Social Security Teaching Hospital from June, 2009 to May, 2010. Entitled patients that included the industrial labour and their dependents who were clinically diagnosed to be suffering from herpes zoster during the above mentioned period were included in the study. All the findings were recorded on a pre-designed pro forma.

***Results*** Fifty two enrolled patients constituted 0.46 per cent of overall OPD patients, with male to female ratio of 2:1 and the mean age at presentation was 47 years. Average duration of symptoms at presentation in herpes zoster ophthalmicus (HZO) was 4.5 days while in remaining cases it was 5.6 days. The surge of the cases was noted with onset of summer and most common dermatomes involved were thoracic followed by ophthalmic division of trigeminal nerve.

***Conclusion*** There is a relationship between herpes zoster and seasonal variations which seems to be different from temperate climate of western countries.

***Key words***
Herpes zoster, seasonal variations, Pakistan.

## Introduction

Herpes zoster caused by the reactivation of dormant varicella-zoster virus (VZV) is generally limited to the dermatome innervated by spinal and cranial sensory ganglion. VZV is found in a worldwide geographic distribution, but annual epidemics are more prevalent in temperate climates and over 90 percent of adults in the United States have serologic evidence of VZV infection and are at risk for herpes zoster.[1,2] In Pakistan and certain other Asian countries the overall seroprevalence of primary varicella infection is relatively low and late.[3,4,5] This combined with variable climatic conditions may be responsible for a different seasonal and morphological pattern in herpes zoster.

The virus is reactivated after a variable period ranging from a few years to decades after primary varicella infection. This reactivation of the virus results from depression of specific cell-mediated immunity, which in turn may be triggered by age, genetic predisposition, trauma, sunburn, exhaustion, psychological stress,

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immunosuppression or irradiation.[6] The clinical expression of the disease from mild to disseminated is related to the rapidity of immune response that is very variable in different people.[7] We undertook this study to know the seasonal variations and morphological characteristics of herpes zoster in lower socioeconomic group comprising industrial labour and their dependants who are entitled for free treatment at Social Security Teaching Hospital, Lahore.

**Patients and methods**

This hospital-based observational study was carried out at the Dermatology department of Nawaz Sharif Social Security Teaching Hospital, affiliated with the University of Lahore, from July, 2009 to June, 2010. All patients gave written informed consent before participating in the study which was approved by the institutional review board of the hospital. All cases of herpes zoster attending skin OPD and those referred from different screening clinics across the province of Punjab were evaluated and included in the study. After induction, the patients were examined and detailed history was taken. The diagnosis was clinical, based on the typical grouped vesicles found in a dermatomal pattern. Information including patients' demographic data, site of lesions, risk factors, associated systemic disease, and complications were noted. Patients were offered indoor treatment and if declined were reviewed weekly in the outdoor clinic.

**Results**

Fifty two consecutive cases of herpes zoster were recruited from July, 2009 to June, 2010. Among the total of 11280 new cases attended in skin OPD during the study period, the frequency of occurrence of herpes zoster cases was 0.46%. The cases included 5 children and 47 adults. Out of 52 patients, 35 were males and 17 females with male to female ratio of 2:1.

The mean age at presentation was 47 years with the range of 2 to 86 years. However, in 14 (26.9%) patients, presenting with herpes zoster ophthalmicus (HZO), the mean age of presentation was relatively less i.e.; 43 years. Out of 52 patients, 5 (9.6%) were children. The average duration at presentation in HZO was 4.5 days while in remaining cases it was 5.6 days.

There was a surge of cases with onset of summer in the months of April and May. The breakdown of the cases is given in **Figure 1**.

Thoracic dermatomes were the most frequently involved, followed by 5$^{th}$ cranial nerve. In the remaining dermatomes cervical were followed by lumbar and sacral dermatomes. Breakdown is given in **Table 1**.

Systemic diseases seen in association with herpes zoster were diabetes mellitus in 3 cases, and 1 patient was on chemotherapy and immune status was normal in all the remaining cases.

**Discussion**

VZV is found in a worldwide geographic distribution, but annual epidemics are more prevalent in temperate climates, occurring most often during late winter and spring.[1] Varicella zoster virus (VZV) predominantly affects children in temperate countries, with near-universal seroconversion occurring by late childhood.[2] Seasonal and regional variations in herpes zoster suggest that temperate climates might favour transmission of VZV, with incidence peaking during cooler months in temperate regions. Most studies have not documented a seasonal pattern of incidence of

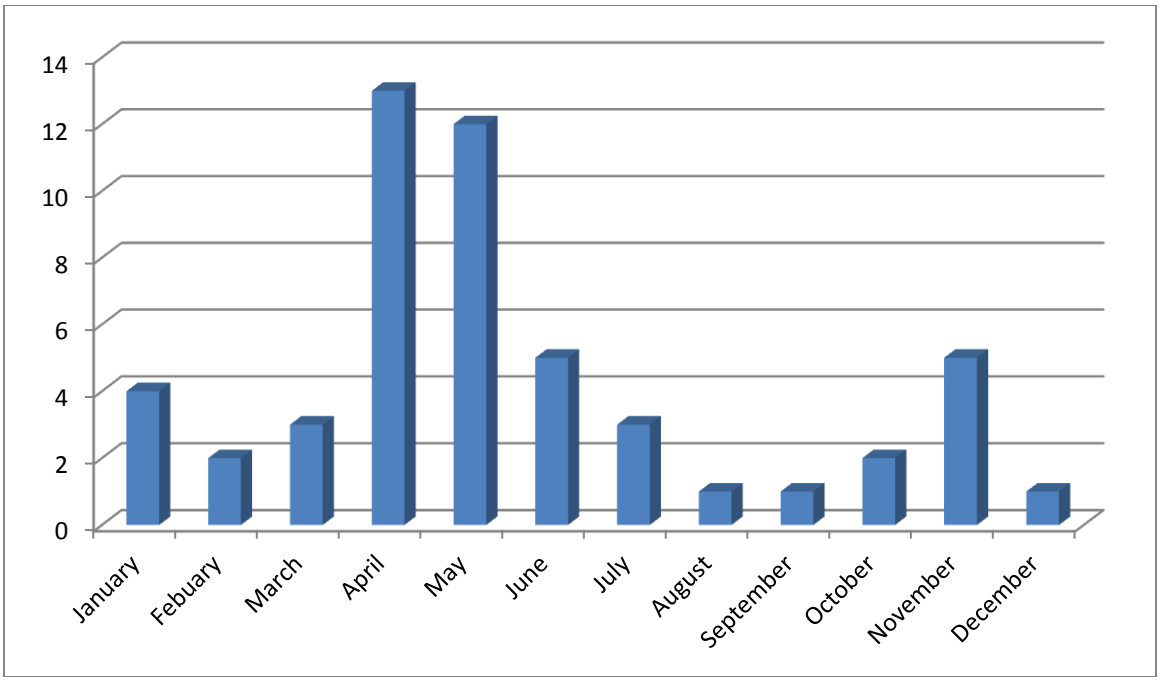


**Figure 1** Seasonal variation in herpes zoster cases.

**Table 1** Dermatomal distribution and sex of patients.

| *Dermatome/ cranial nerve* | *Male* | *Female* | *Total N (%)* |
|---|---|---|---|
| 5th cranial nerve | 9 | 5 | 14 (26.9%) |
| 7th cranial nerve | 0 | 1 | 1(1.9% |
| Cervical | 5 | 0 | 5 (9.6%) |
| Thoracic | 16 | 10 | 26 (5%) |
| Lumbar | 3 | 1 | 4 (7.6 %) |
| Sacral | 2 | 0 | 2 (3.8%) |

Zoster indicating that disease results from the reactivation of latent virus rather than new exposures to VZV.[11] However, certain studies have reported summer seasonality, and this pattern might be related to ultraviolet irradiation that peaks during summer months and might serve as a trigger for zoster.[11]

However, in Pakistan, occurrences of primary VZV infection is late and most commonly involves the adults with seroprevalence rate of 47.1%.[3] Similarly in Sri Lanka seroprevalence rates were markedly lower in all age groups when compared to temperate climates and this increased with age in both the rural and urban populations. Of those aged 60 years and above, only 50% in the rural population and 78.9% in the urban population were immune to VZV.[4] In Japan a large-scale survey clarifies the epidemiology of herpes zoster by age, gender and seasonal variations in relation to herpes zoster with peak incidence in August and lowest in winter in contrast to western counties.[5] According to an Australian study contrary to the conventional assumption, which is based on observations in temperate regions elsewhere in the world, there was no consistent evidence of seasonal peaks during late winter and early spring for varicella infection in Victoria.[12] Similarly a Korean study regarding seasonal variation of herpes zoster suggested that there was no relation between epidemic of varicella and herpes zoster and the most cases were recorded during summer, and the least in autumn.[13] In our study although the cases continued to report throughout the year but surge of the cases of herpes zoster was noted with onset of summer season in the months of April, May and June. This is in contrast to temperate climate of western countries but

consistent with the pattern in other Asian countries.

Increasing age is a key risk factor for the development of herpes zoster; the incidence of shingles among persons older than 75 years of age exceeds 10 cases per 1000 person-years.[14] The lifetime risk of herpes zoster is estimated to be 10 to 20 percent.[10] The average age at presentation in our study was 47 years and in patients with HZO, it was 43 years which is less than the findings of Goh and Khoo.[15] In another Indian study the average age of presentation was 37 years.[16] This suggests that late seroconversion in tropical countries may cause early onset of herpes zoster.

Herpes zoster most often involves the thoracic dermatomes, particularly T5 to T12[14] and 20% of patients have disease in the distribution of a cranial nerve, and lumbosacral dermatomes, especially L1 to L2, are affected in 16% of patients.[17]

In another study,[15] dermatomes most commonly involved were thoracic in 45% and cervical in 23%. Ophthalmic zoster was seen only in 3% cases. An Indian study suggests the dermatomal involvement in decreasing order of frequency was thoracic, followed by ophthalmic and sacral.[18] In our study, thoracic dermatome was involved in 26 (50%) cases followed by ophthalmicus in 14 (26.9%) cases, cervical in 5 (9.6%) cases, lumbar in 4 (7.6%) cases, sacral and 7th cranial nerve in one case each. This is in contrast to the study by Goh and Khoo[15] where dermatomes most commonly involved were thoracic in 45% and cervical in 23%. Ophthalmic zoster was seen only in 3% cases.[15] So as far as involvement of thoracic dermatomes is concerned, there is consistency in different studies but in all other dermatomes variable pattern may emerge.

Despite this fact that approximately 99.5% of the U.S. population aged ≥40 years has serologic evidence of previous infection, and all older adults are at risk for zoster,[19] the majority cannot recall a history of varicella.[20] In our study only 9 (17.3%) patients could recall the history of chickenpox despite normal memory, emphasizing the opinion that majority of our people have subclinical exposure in early life.

## Conclusion

Herpes zoster in our population commonly occurs in a relatively younger age and clustering of cases occurs with the onset of summer.

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