

CLINICO-EPIDEMIOLOGICAL STUDY OF HERPES ZOSTER CASES DURING THE COVID-19 PANDEMIC; A PARADIGM SHIFT TO THE YOUNG

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Abstract

Background: Herpes zoster (HZ) is caused by reactivation of the neurotropic Varicella zoster virus (VZV) and is known to cause considerable morbidity in the older age group. Its incidence rises with age, poor immunity and there has been reports of increasing incidence with COVID-19 infection. This study was undertaken to study the incidence of herpes zoster in various age groups, the clinical profile, risk factors during the COVID-19 pandemic period and to improve patient care by early diagnosis and methods to prevent herpes zoster and its recurrence. The aim was to study the clinico-epidemiological features of herpes zoster during the COVID-19 pandemic period and to ascertain whether the incidence of herpes zoster is higher in a particular age group during the period. **Materials and Methods:** A cross sectional study was conducted in the department of dermatology, KMCT Medical College, Kozhikode, India for a period of one year from April 2020 to March 2021 during the COVID-19 pandemic period in India. All patients attending the dermatology outpatient department with a clinical diagnosis of herpes zoster were included in the study after obtaining informed consent. Patient's demographic details, history, clinical features were collected and analyzed. Dermatological examination was also done for segments involved. Blood investigations, complications type and rate were analyzed. Patients were reviewed two weekly for 6 weeks. Analyzed results was expressed as frequency, percentage, mean and standard deviation. **Result:** In the total of 85 patients, females (51.8%) were slightly more affected than males (48.2%) in our study and the incidence was higher in patients less than 60 years of age contrary to literature data. The thoracic dermatomes were the most frequently involved than other dermatomes. Secondary infection was the most common complication observed. Of the 30 patients tested for COVID-19, 6 were found to be positive. **Conclusion:** There was an increasing incidence of Herpes zoster among adults compared to the geriatric population during the COVID-19 pandemic period and COVID-19 infection may by itself predispose to development of herpes zoster.

INTRODUCTION

Herpes zoster (HZ) is a localized disease caused by reactivation of the neurotropic varicella zoster virus (VZV) in the sensory ganglia and characterized by pain and vesicles in a segmental distribution.^[1,2] The incidence of Herpes zoster increases with age with an incidence of 2.0/1000 person year among the childhood group to 21.8/1000 person year in those aged 70–79 years. Peak incidence of herpes zoster is

documented in the 60–69 age group.^[3] This is probably due to the immunosenescence associated with advancing age, but it can affect individuals of any age, especially those with a suppressed cell mediated immunity due to any disease or drugs.^[4,5] Vaccination against herpes zoster virus is the mainstay of prevention of herpes zoster infection.^[6] Rise in the incidence of herpes zoster and post herpetic neuralgia (PHN) is expected with the increase in life expectancy and increase in

prevalence of human immunodeficiency virus (HIV) and wider use of varicella vaccination and hence a lesser exposure to circulating VZV.^[7,8] With the advent of COVID-19 pandemic an increasing incidence of herpes zoster has been reported.^[9] Hence this study was undertaken to study the incidence of herpes zoster in various age groups, the clinical profile, risk factors during the COVID-19 pandemic period and to improve patient care by early diagnosis and methods to prevent of herpes zoster and its recurrence.

Objectives

1. To study the clinico-epidemiological features of herpes zoster during the COVID-19 pandemic period in India.
2. To ascertain whether the incidence of herpes zoster is higher in a particular age group

MATERIALS AND METHODS

A cross sectional study was conducted in the department of dermatology, KMCT medical college for a period of one year from April 2020 to March 2021 during the COVID-19 pandemic period in India. A total of 85 patients in the age group of 13-83 years who attended the dermatology outpatient department with a clinical diagnosis of herpes zoster was included in the study after obtaining informed consent. Permission was obtained from the Ethical Committee before performing the study.

Inclusion and Exclusion Criteria

All patients of all age and sex who were clinically diagnosed as Herpes zoster were included in the study. Those patients who were not willing to participate in the study were excluded.

Patient demographic details, history, clinical features were noted and dermatological examination for segments involved, complications etc. were done and basic blood counts, blood sugar and HIV card testing was done. Patients were reviewed two weekly for 6 weeks.

Statistical Analysis

Data was entered in Microsoft Excel Software and statistical analysis was done using Statistical Package for the Social Sciences Software (SPSS ver 20.0). Numerical variables were expressed as Mean and Standard deviation and categorical variables as frequency and percentage.

RESULTS

Total of 85 patients were included in the study. Out of which 44 (51.8%) were females and 41(48.2%) males. The age group ranged from 13 years to 83 years and the mean age of patients were 49.55years. 59 patients (69.4%) were less than 60 years and 26(30.6%) patients were above 60 years. Highest incidence was in the age group 51-60 years followed by 41-50 years and 71-80 years. The age distribution of patients is shown in [Table 1].

Thoracic segments were the most commonly affected by zoster lesions followed by the trigeminal nerve (maxillary branch was most commonly involved, followed by ophthalmic and mandibular branch) followed by lumbar and cervical segments. The right side (n=48,56.5%) was more commonly affected than left side (n=37,43.5%). One patient had more than one dermatome involved. [Table 2] shows segmental distribution of lesions of participants in the study.

Table 1: Age distribution of study participants.

Age group	Frequency	Percentage
11-20	6	7.1
21-30	12	14.1
31-40	9	10.6
41-50	15	17.6
51-60	17	20
61-70	10	11.8
71-80	14	16.5
81-90	2	2.4
Total	85	100

Table 2: Segmental distribution of lesions among study participants.

Site	Frequency	Percentage
Cervical	10	11.8
Lumbar	11	12.9
Sacral	5	5.9
Thoracic	42	49.4
Lumbar-sacral	1	1.2
Mandibular trigeminal	2	2.4
Maxillary trigeminal	8	9.4
Ophthalmic trigeminal	6	7.1
Total	85	100

Table 3: Type of complication

Complication	Frequency	Percentage
Dissemination	1	3
PHN	14	42.4
Secondary infection	16	48.5
PHN & secondary infection	1	3
Secondary infection & ulceration	1	3
Total	33	100



Figure 1: Different dermatomes involved in herpes zoster

[Figure 1] shows, A. Herpes zoster involving T1 dermatome in a 22 year old male, B. Herpes zoster involving the C5, C6 dermatomes, C. Herpes zoster involving C7, C8 dermatomes in a 20 year old male and D. Herpes zoster ophthalmicus of left side with involvement of tip of nose in a 58 year old female patient.

Of the 85 patients 58(68.2%) had a definite history of chicken pox in the past and among these, the majority(n=41) had it before the age of 20 years. Others did not or were not aware of having chickenpox earlier. This was the first episode of herpes zoster in 94.1%(n=80) patients and 5.9%(n=5) had an episode of herpes zoster before.

29 patients (34.1%) had comorbidities which can provoke herpes zoster like diabetes, on steroids or immunosuppressants, chronic kidney disease, malignancy etc. In 68.2% patients the disease resolved within 2 weeks, in 21.2% within 2-3 weeks and it took about 3-4 weeks in 9.4% while 1.2% had a resolution with just 1 week. Out of the 85 patients, 33(38.8%) developed complications. Secondary infection (54.5%) was the most common complication followed by post herpetic neuralgia (PHN) (45.4%). [Table 3] shows the various complications noted and its frequency.

72 patients (84.7%) had significant prodromal symptoms like fever, pain, tiredness, malaise etc. before the onset of vesicles while 13 patients (15.3%) did not notice any prodromal symptoms.

9 patients (10.6%) had high blood sugar values while the blood sugars were normal in rest of the patients. HIV testing was done in all patients and was negative. COVID-19 RAT was done in 30 patients and was positive in 6 patients (20%). Of these 66.6%(n=4) were less than 60 years of age and with no other comorbidities. All 6 patients had a history of chicken pox earlier. These 6 patients also experienced prodromal symptoms like fever in 4 patients, tiredness in 1 and pain in 1 patient. 1 patient developed post herpetic neuralgia.

DISCUSSION

In our study of 85 patients, females (51.8%) were almost equally affected as males (48.2%). This is similar to studies from the west where an almost equal incidence was seen in both sexes, but in contrast to other studies from South India which showed an increased incidence in males. Stress factors during the COVID-19 pandemic could have caused the increased incidence in females.^[10-13]

Majority of patients affected with herpes zoster in our study were less than 60 years of age (69.4%) which is contrary to literature where herpes zoster is predominantly a disease of older age group but similar to a study from Kerala, India where patients were predominantly adults.^[2,12,14] A study by Brisson et al. showed that a mass childhood immunization against varicella zoster virus caused an increase in the incidence of herpes zoster during the first 30 – 50 years of life.^[15] Wider use of varicella vaccination leads to reduced prevalence of varicella, thereby resulting in reduced chances of periodic re-exposure to varicella. This in turn can reduce natural boosting of immunity and lead to an increased incidence of herpes zoster.^[7,8] Also, loss of job, financial problems, restriction of movement etc acting as stress factors during the pandemic period and COVID-19 infection itself might have caused the increased incidence in adults. Since the emergence of the COVID- 19 pandemic, numerous scientific papers observed and reported increased number of cases of HZ infections during the COVID- 19 outbreak, proposing a probable co- existence of the two viruses, or an increased prevalence of HZ in the context of COVID- 19 infection and vaccination.^[9]

Thoracic segment was the most commonly involved in our study, followed by the trigeminal nerve as in previous studies,^[2,13] and then the lumbar and cervical segments. 68.2% had a definite history of chicken pox in the past and among these, the majority(n=41) had it before the age of 20 years. 5.9% (n=5) had an episode of herpes zoster before. The memory immunity to varicella zoster virus may be enhanced by exogenous boosting (by exposure to varicella) or endogenous boosting (subclinical reactivation from latency).^[16] The average period of immunity against varicella following an infection was 20 years in previous studies but was higher, about 51 years, in our study.^[15] 29 patients (34.1%) had comorbidities which can provoke herpes zoster like diabetes, on steroids or immunosuppressants, chronic kidney disease, malignancy etc. Age, stress, immunocompromised status, and immunosuppressive drugs are known factors for virus reactivation.^[17]

33 patients (38.8%) developed complications. Secondary infection (54.5%) was the most common complication followed by post herpetic neuralgia (45.4%) in our study, which is similar to another study from south India,^[18] while PHN is most

commonly reported in literature.^[19] Complications of herpes zoster are more common among elderly individuals and immunosuppressed patients. The complications noted in other studies following post herpetic neuralgia, include secondary bacterial infections, ophthalmic complications, cranial and peripheral nerve palsies, and segmental zoster paresis.^[19]

Herpes zoster infection usually begins with prodromal symptoms such as pain, fever, malaise, headache, itch, and paresthesias which precede the rash by a few hours to several days in most patients.^[20,21] 84.7% patients in this study had significant prodromal symptoms like fever, pain, tiredness, malaise etc. before the onset of vesicles which was higher than previous studies from south India.^[2,18]

HIV testing was done in all patients and was found to be negative in our study probably due to the low prevalence in our region. The incidence of herpes zoster in HIV seropositive individuals is higher compared to HIV seronegative individuals. Cellular immunity plays a role in the inactivation of the herpes zoster virus. Patients with HIV experience a decline in their CD4+ cells and an increase in their CD8+ cells, leading to an increase in the incidence of herpes zoster infection.^[22]

In this study COVID-19 RAT testing could be done in 30 patients and 6(20%) of them were positive. Of these 66.6%(n=4) were less than 60 years of age and with no other comorbidities. COVID- 19- associated lymphopenia, especially CD3 + CD8 + lymphocyte and functional impairment of CD4 + T cells, can render COVID patient more prone to evolving HZ by reactivating VZV.^[23] It is also stated that HZ might be an indication of undiagnosed COVID- 19 infection in younger age groups.^[24-26]

Limitations of the Study: COVID testing could be done in only 30 patients.

CONCLUSION

To conclude, even though herpes zoster is traditionally thought to be a disease of elderly, there is a shift to the younger population for which multiple factors including widespread varicella vaccination in children limiting re-exposure to the virus, increased stress affecting the working adult population in the wake of COVID-19 pandemic, COVID-19 infection itself and more patients with immunocompromised states may be responsible. Herpes zoster vaccine is currently recommended in ages above 60 years but it may have to be reconsidered due to the increasing incidence in the younger population.

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