

Prevalence of Herpes Zoster in Various Age Groups at a Tertiary Care Hospital in Pakistan

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Abstract

Background: Herpes zoster (HZ) is a painful neurocutaneous disease. It presents as reactivation of dormant varicella zoster virus that involves cranial nerves or sensory nerve ganglia of dorsal root resulting in spread of the virus in a dermatomal fashion.

Objective: To determine the prevalence of herpes zoster in various age groups among patients attending the Outpatient department of Dermatology of Fauji Foundation Hospital, Rawalpindi.

Methods: This Observational study was conducted at Department of Dermatology, Fauji Foundation Hospital, Rawalpindi from January 1st, 2021 to June 30th, 2021. Record of all the patients visiting the outpatient department was obtained. Diagnoses were categorized into two groups: herpes-zoster and not-herpes-zoster. Prevalence was calculated for different genders and age groups and the statistical significance of the difference was assessed using chi-square test.

Results: The overall prevalence of herpes zoster was 1.03%. Male to female ratio of prevalence was 1.02:1. The prevalence increases with age, with highest prevalence observed in patients in the 80-102 years age group.

Conclusion: Prevalence of herpes zoster increases with age, highlighting the increased vulnerability of the elderly to this condition.

Keywords: Herpes zoster, varicella zoster, shingles, prevalence, prevalence in age groups, tertiary hospital, tertiary care hospital.

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Introduction

Herpes zoster (HZ) is a painful neurocutaneous disease. It presents as reactivation of dormant varicella zoster virus that involves cranial nerves or sensory nerve ganglia of dorsal root resulting in spread of the virus in a dermatomal fashion. The Varicella Zoster virus has global prevalence¹ with the lifetime risk of infection in the general population between 20% to 30%.^{2,4} The virus is transmitted during primary infection commonly known as chicken pox years or decades ago.⁴ Its typical presentation includes a vesicular or pustular eruption associated with extreme pain and

burning sensation that has dermatomal confinement and usually involves one side of the body.^{2,3}

Majority of the affected patients complain of excruciating prickling or burning pain, itching, hypersensitivity, or numbness over the affected area. Sleeplessness, stress, and body aches are also reported during the course of infection.^{1,3}

The infection is more common in elderly, women, Caucasians, immunocompromised patients, and those with a previous family record of HZ infection.^{1,4} Primary infection occurring during pregnancy or first year of life when the

immune system is immature is a suspected cause of HZ infection during childhood.¹

Few medications and diseases that lower innate immunity also add up to the risk factors.⁴ Yearly, more than a million cases are estimated in US. The risk of infection increases exponentially when patient crosses the age of 50 years. After the age of 85 years, the lifetime risk adds up to 50%.⁴⁻⁶ Every year outbreaks are more widespread in temperate zones as compared to other zones. 90% of US adult population is seropositive and has higher chances of getting HZ infection.⁸ The seroprevalence of primary infection is comparably less in Pakistan and few other Asian countries.^{5,9} The most bothersome sequelae following HZ is postherpetic neuralgia that is defined as persistent or recurrent pain for more than a month after appearance of rash better observed after three months.¹

Postherpetic neuralgia can be severe affecting mental and physical health of the individuals, occupation and their inability to carry out daily life chores.¹ Bell's palsy, Ramsay hunt syndrome, transverse myelitis, cerebrovascular events and ischemic injury are a few complications noted in HZ cases.³

The study was conducted to find the disease burden of HZ in our setup and the prevalence in different age groups. HZ is associated with considerable morbidity, particularly in high-risk age groups.⁸⁻⁹ In Pakistan, limited data on the age-specific prevalence of HZ in different geographies hinders effective public health planning and targeted interventions. Assessing the prevalence across age groups is essential to understand the disease burden and identify the most affected demographic segments. This study aims to bridge this knowledge gap, providing insights that can support awareness initiatives and guide vaccination programs to prioritize high-risk groups.

Methods

The study was conducted in the Department of dermatology at Fauji Foundation Hospital, Rawalpindi. Patients of all age-groups and both genders who visited the Outpatient Department (OPD)

between January 2021 and June 2021 were included in the study.

In the OPD, the diagnosis of HZ was established primarily based on clinical presentation by the clinicians. The data on gender and age were also recorded based on the information provided by the patient. This record of diagnosis along with other information such as age, gender, date of visit etc. was recorded in the hospital "Medix Online Reporting System", which is an Electronic Medical Record (EMR) database containing details of all patients visiting OPD. The data was obtained in the digital form from the Medix Online Reporting System.

To determine prevalence, the technique used for sample collection was non-probability total population sampling where "population" was defined as "all patients visiting OPD of Department of Dermatology of Fauji Foundation Hospital, Rawalpindi between January 1st, 2021 and June 30th, 2021.

All patients including males and females of all age groups visiting the OPD during the study duration and whose record was available in the Medix Online Reporting System were included in the study. Repeat visits of same patient were identified using the Medical Record ID in the Medix Online Reporting System and excluded from the study to avoid duplication and reduce selection bias.

Permission for usage of OPD data was taken from hospital administration after full explanation of procedure regarding this study. Data collection was approved from the hospital ethical committee.

The data were analyzed in IBM SPSS Statistics Version 25. The period prevalence of HZ was calculated using the total number of patients seen in the OPD and the number of patients of diagnosed with HZ. Similarly, prevalence in different age groups was calculated using the total number of patients of that age group seen and the number of patients of that age-group diagnosed with HZ. The frequency of HZ in different age groups and genders was calculated using the total number of patients diagnosed with HZ.

Results

During the 6 months study period, a total of 10169 patients visited the Dermatology OPD. All these patients were included in the study. Among these, 8547 (84%) were females and 1622 (16%) were males. The mean age of these patients was 37.67 years with standard deviation (SD) of 19.76. The minimum age recorded was “under 1 year” and the maximum age was “102 Years” (Figure 1).

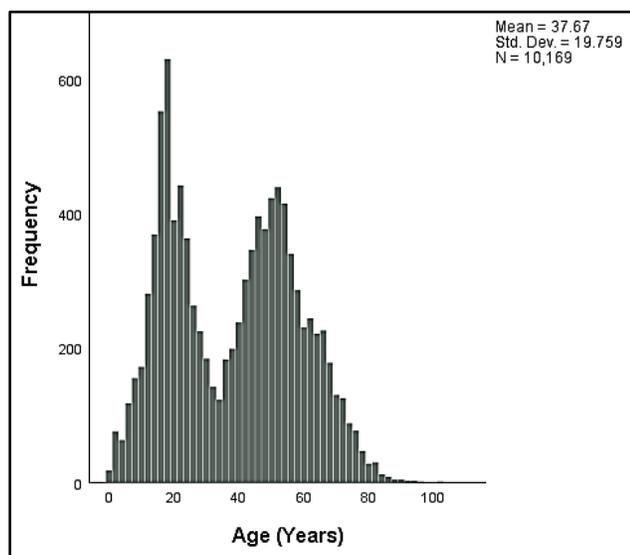


Figure 1: Age distribution of patients included in the study.

Among the total (10169) patients, 105 (1%) were diagnosed as HZ while 10064 (99%) were given diagnoses other than HZ. Among the 105 HZ patients, 88 (83.8%) were females while 17 (16.2%) were males. The mean age for HZ patients was 59.4 years with SD of 16.08. The minimum age recorded for was 5 years and the maximum age was 102 years.

The prevalence of herpes zoster in females was 1.02% while in males it was 1.04%, resulting in a Male to Female of ratio of prevalence equal to 1.02:1. The relationship between these values was not statistically significant, $X^2 (1, N=105) = 0.005$, $p=0.946$.

The frequency of herpes zoster was highest (36) in the age group “61-70 Years” and lowest (1) in the age groups “0-10 Years” and “21-30 Years” (Figure 2).

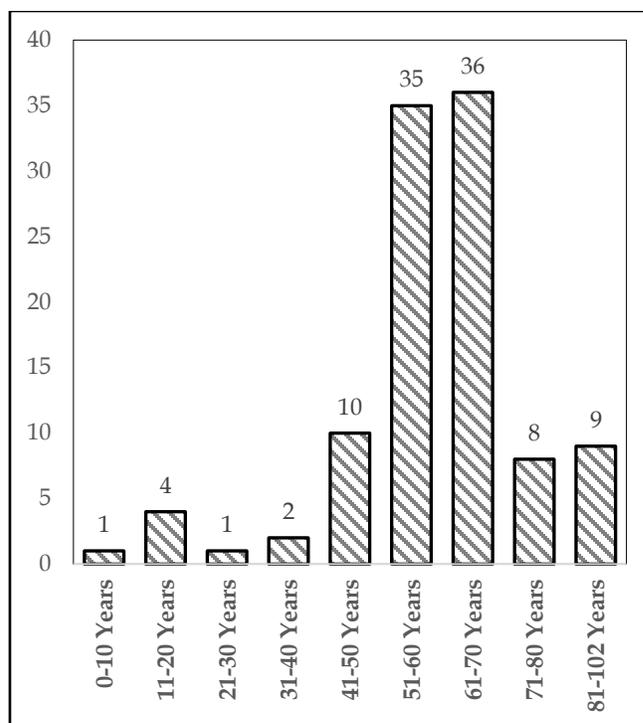


Figure 2: Frequency of Herpes Zoster in Different Age Groups.

Table 1: Prevalence of herpes zoster in different age groups.

Age Group	Total Patients	Frequency of herpes zoster	Prevalence (%)
0-10 Years	602	1	0.16
11-20 Years	2222	4	0.18
21-30 Years	1477	1	0.06
31-40 Years	885	2	0.22
41-50 Years	1844	10	0.54
51-60 Years	1711	34	2.00
61-70 Years	999	36	3.60
71-80 Years	365	8	2.19
81-102 Years	64	9	14.06

The prevalence was found to be highest (14.06%) in the age group “81-102 Years” while lowest (0.06%) in the age group “21-30 Years” (Table 1).

Discussion

Herpes Zoster, also known as shingles, is a viral infection that occurs with reactivation of the varicella-zoster virus. Any patient who has had chicken pox in the past can develop HZ. In these

patients, the virus remains dormant (inactive) within the dorsal root ganglia, often for decades after the patient's initial exposure. Reactivation of dormant varicella-zoster virus (VZV) results in HZ. It is usually a painful but self-limiting rash that follows a dermatomal pattern. Symptoms typically start with pain along the dermatome affected, followed by a vesicular eruption within 2-3 days. Typical findings on physical examination include painful herpetiform vesicles that group together on an erythematous base. Diagnosis of HZ is primarily clinical. Although laboratory tests such as Polymerase Chain Reaction (PCR) and Direct fluorescent antibody (DFA) testing of vesicular fluid are available, confirming the diagnosis via testing has limited utility in most cases.¹⁰ In immunocompromised patients, where presentation may be atypical, these laboratory tests are used more often. Treatment includes antiviral drugs such as acyclovir.¹¹ Although majority of the cases of HZ are mild, in some patients it can lead to post-herpetic neuralgia (PHN) resulting in a significant morbidity and economic burden.

Our study focused on frequency and prevalence of HZ in different age groups. The mean age of HZ patients in our study was 59.4 Years (SD 16.089). This is different from the study on the population of labor community in Lahore published by Majid Sohail et al,¹² in which the mean age was reported to be 47 years. Similarly, in a study on the patients of Liaquat University Hospital Hyderabad, published by Daulat Rai Bajaj et al,¹³ the mean age of HZ patients was reported to be 38.9 years. It is evident that our study reported a higher mean age for the patients of HZ, which is supported by the frequency of HZ cases in different age groups.

A study on twenty-year audit of HZ in Asia Pacific published by Liang-Kung Chen et al,⁹ reported the overall incidence of 3-10/1000 person-years in the Asia Pacific region. In our study the highest frequency (36 cases) of herpes was in the age group 61-70 years. Similarly, the highest prevalence (14.06%) was observed in the age-group 81-102 years. In a study published by Robert W. Johnson et al. on European population,¹⁴ it was

reported that the incidence of HZ increases with age and the highest incidence was in the population above 70 years. Similarly, in a systematic review of incidence and complication of HZ published by Kosuke Kawai et al,⁴ the average incidence rate of was reported 3-5/1000 person-years in North America, Europe and Asia-Pacific. In the same study, the highest age-specific incidence rate was observed in patients 60 years or above. Hence our observation of increased frequency and prevalence of HZ in higher age groups is supported by other studies both nationally and internationally.

In our study, the male to female ratio of prevalence of HZ was observed to be 1.02:1, showing no statistically significant difference ($p>0.05$) among the genders. The hospital in which our study was conducted offers entitlement to the families of retired army servicemen however, their male children are entitled up to the age of 18 years and female children are entitled until marriage. This entitlement system results in a lower male to female among the patients, which is a limitation for our study. The male to female ratio we observed was close to the one reported in the study on the population of North America published by M. W. Ragozzino et al,¹⁴ in which it was 0.94:1. In the study on the population of Liaquat University Hospital Hyderabad published by Daulat Rai Bajaj et al,¹³ the male to female ratio was reported to be 2.9:1 which is considerably higher in comparison to our study.

The challenges in prevention and treatment of HZ have indicated the need for an effective immunization strategy against this disease.^{15,16} The United States Food and Drug Administration (FDA), Health Canada, and the European Medicines Agency (EMA) currently license two vaccines: live attenuated herpes zoster vaccine (LZV) (Zostavax®) and recombinant herpes zoster vaccine (RZV) (Shingrix®). The LZV has been available since 2006 while the RZV has been recently introduced.¹⁷ In a clinical trial conducted by Schmader et al, on efficacy, safety and tolerability of LZV in persons aged 50-59 years,⁷ HZ risk reduction was reported to be 69.8% at median

follow up of 1.3 years and 51.3% at median follow up of 3.1 years. HZ risk reduction was reported to be 97.2% at median follow up of 3.2 years. The evidence suggests that both these vaccines are effective and safe for prevention of HZ in older adults.¹⁷

The diagnosis of herpes zoster was established solely by clinicians based on patients' clinical presentations, without laboratory confirmation or further diagnostic steps to verify accuracy. This reliance on clinical judgment may introduce some diagnostic variability.

Age and gender data were collected based on patient-reported information, which may be subject to inaccuracies due to reporting errors or recall biases. Such inaccuracies could slightly impact the demographic distribution of herpes zoster cases in this study.

The data were extracted from the Medix online reporting system, the hospital's electronic medical record database. Any patients not recorded in Medix would be excluded from our analysis, potentially affecting prevalence estimates.

Conclusion

Prevalence of herpes zoster increases with age, making the elderly population at a higher risk for this condition. These findings underscore the need for targeted preventive strategies, including awareness and vaccination efforts, to reduce the burden of disease among the elderly population.

Ethical Approval: This study was approved by Ethical Review Committee of Fauji Foundation Hospital, Rawalpindi vide letter Ref No. 642RC/FFH/RWP.

Conflict of Interest: There was no conflict of interest to be declared by any author.

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Author's Contribution

AZ: Conceptualization of study design, data collection, write-up, review of the manuscript.

AI: Literature search, analysis of data, data interpretation, write-up.

AJ: Literature search, Proof reading.

FR: Conceptualization of the study design and review of the manuscript critically.

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