

## Herpes zoster in children

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**Abstract** *Objective* To study the epidemiology and clinical features of childhood herpes zoster.

*Patients and methods* The study was carried out from March 2008 till February 2012. Forty two cases of herpes zoster in children less than 12 years of age were enrolled from the outpatient departments of Lahore General Hospital and Jinnah Hospital Lahore. Patients were subjected to detailed history, physical examination and relevant investigations.

*Results* Out of 42 patients with herpes zoster, 57.1 % were males and 42.9 % were females. The mean age was 8 years with an age range of 18 days to 12 years. In most patients a single dermatome was involved (69%) and thoracic dermatome was involved in the majority (40.4%). The most common symptom was pruritus in 52%, followed by pain in 12%. A positive history of previous exposure to varicella was present in 31% patients only, and out of these 61% were exposed before the age of two years. Six patients gave history of chickenpox in mother during pregnancy. Majority of patients i.e. 83.3% showed no evidence of immunosuppression on history, examination and investigations. Three patients were anti-HCV positive (7.1%), two (4.6%) had tuberculosis, one (2.3%) patient was taking steroids and one (2.3%) was diagnosed as leukemia.

*Conclusion* Most of the children with herpes zoster had no obvious evidence of immunosuppression. History of previous exposure to varicella was found in only 31% with majority being exposed below two years of age. Herpes zoster is a relatively mild disease in children with pruritus being the main symptom in 52% and pain occurred in only 12% of cases.

**Key words**

Herpes zoster, shingles, varicella, children.

### Introduction

Herpes zoster is a viral illness caused by reactivation of previously acquired varicella-zoster virus occurring in a dermatomal pattern. The primary infection i.e. chickenpox usually occurs in childhood whereas herpes zoster is considered to be an ailment of the elderly. The age adjusted incidence rate in children below 14

years is only 0.45 per 1000 persons while in the age group of 75 years and above it is up to 4.5 per 1000 persons.<sup>1</sup>

Although childhood herpes zoster is considered to be rare, many studies have shown an increasing incidence.<sup>2</sup> It is frequently seen in children with acquired cellular immune deficiency as in patients on chemotherapy or with HIV.<sup>3</sup> Herpes zoster may also occur in immunocompetent children and recent reports show an increase in the number of cases in apparently healthy children.<sup>4</sup>

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Extensive data regarding herpes zoster in adults are available but studies regarding this disease in children are limited. The present study was undertaken to study the epidemiological and clinical features of herpes zoster occurring in children below 12 years of age presenting at a tertiary care unit.

### **Patients and methods**

The data presented in this study were collected at the departments of dermatology, Lahore General Hospital and Jinnah hospital Lahore respectively, over a period of four years from March 2008 till February 2012. A total of 42 children below 12 years of age both male and female, presenting with a clinical diagnosis of herpes zoster were enrolled in the study. An informed consent was obtained from the parents and all information was recorded on a pre-designed pro forma. A detailed history included history of chickenpox in the past, both in the patient and in other family members, history of chickenpox or herpes zoster in the mother at the time she was pregnant with the patient and history pertaining to any evidence of immunosuppression. Clinical examination to ascertain the dermatome involved, any evidence of dissemination, and any other manifestation of immunosuppression was carried out. In majority of the patients the diagnosis was clinical. However, in a few doubtful cases Tzanck smear for viral giant cells was carried out. Other investigations such as complete blood count, ESR, liver function tests, HBsAg, anti-HCV antibodies and renal function tests were done in all patients. Chest X rays were done in 9 patients with history of chronic cough with expectoration. Abdominal ultrasonography was done in 3 patients with positive anti-HCV antibody.



**Figure 1** Herpes zoster affecting the right ophthalmic division of trigeminal nerve.

### **Results**

A total of 42 patients were enrolled in the study. There were 24 (57.1%) males and 18 (42.9%) females. The ages ranged from less than a month to 12 years, the youngest patient being 18 days of age. Mean age was  $8.2 \pm 2.4$  years. Most of the patients belonged to the age group of 6 to 12 years followed by the age group of 1 to below 6 years.

Dermatomal involvement was thoracic in 17 (40.4%), cervical in 12 (28.6%), cranial (ophthalmic) in 7 (16.7%) [Figure 1] and lumbar in 5 (11.9%) patients. Dissemination was seen in only one patient (2.4%). Sixty nine percent patients showed one dermatome involvement and 28.6% showed involvement of 2 dermatomes. More than 2 dermatomes were involved in only 1 (2.4%) patient. The involvement was right-sided in 20 and left sided in 22 patients. Most of the patients presented with mild to moderate pruritus i.e. 52 %. Only 12 % had pain which was mild in 4%, moderate in 3% and severe pain was present in 5 % of the patients. Presence or absence of symptoms was assessed in patients above two years of age only. Eleven (26%) patients had secondary bacterial infection at the time of presentation.

Out of the total 42 patients, 29 (69%) gave no history of previous chickenpox in patient or chickenpox or herpes zoster in family member or close contact. Out of these only 6 (20%) patients gave a positive history of chickenpox in the mother while she was pregnant carrying the patient. No mother gave history of herpes zoster during pregnancy. Out of the 13 patients previously exposed to varicella, 8 (61%) were exposed below 2 years of age. None of the children gave history of immunization against varicella.

Majority of the patients i.e. 35 (83.3%) showed no evidence of immunosuppression on history, examination and investigations. Three patients were anti-HCV positive, 2 were diagnosed as having pulmonary tuberculosis, one patient was taking systemic corticosteroids for chronic bullous disease of childhood and one patient was recently diagnosed as leukemia although chemotherapy had not yet been started.

### **Discussion**

Primary varicella-zoster infection occurs in the form of chickenpox, usually in early childhood. The virus remains dormant in the dorsal root ganglia till activated when it produces the clinical picture of herpes zoster. This reactivation generally occurs in the elderly and is associated with loss of varicella-zoster virus specific cellular immunity.<sup>5</sup> Similarly herpes zoster in patients on chemotherapy is due to suppression of cellular immunity and in HIV infected individuals it is due to viral destruction of T cells.<sup>6</sup>

A diagnosis of herpes zoster is mainly clinical. Common differentials include zosteriform herpes simplex, bullous impetigo and bullous insect bite reaction. A simple bed side test of Tzanck smear may reveal multinucleated giant

cells on microscopy in case of viral infection. However it is imperative that herpes zoster be differentiated from zosteriform herpes simplex by direct fluorescent monoclonal antibody test, serum specific IgM by indirect fluorescent antibody method or more definitely viral cultures.<sup>7</sup> Unfortunately these tests were not available to us so our diagnosis was mainly clinical or by Tzanck smear in doubtful cases.

Herpes zoster although thought to be a disease of the elderly is increasingly being seen in the younger age groups. Various authors have studied the epidemiology and clinical patterns of this condition in the pediatric population.<sup>8</sup> Out of our 42 patients there was a slight male predominance i.e. 57% and the mean age was 8.2 years which was consistent with other studies.<sup>3,9</sup> Although our youngest patient was 18 days old, majority of the patients were between 6 to 12 years of age i.e. 54%. Infants below one year amounted to only 14% of the total cases. The immunological status of the child at the time of acquiring the primary infection is very important in determining the onset of childhood zoster. In infants, low levels of lymphocytes, natural killer and cytokines, along with virus-specific immunoglobulins result in early appearance of zoster.<sup>10</sup> Of our patients who gave history of varicella exposure in the past more than half i.e. 61% were exposed below 2 years of age. Terada *et al.*<sup>11</sup> showed that healthy immunocompetent children who had primary varicella infection before one year remained positive for VZV for the longest period as determined by PCR reaction.

Herpes zoster in otherwise healthy children may be due to acquiring primary varicella infection in utero or in infancy when the immunity is not fully developed. Vaccination with live attenuated virus may also contribute. However, none of our patients was previously vaccinated.

A large number of our patients i.e. 69% gave no history of exposure to varicella in the past. Of these only 20% gave history of maternal vesicular eruption likely to be chickenpox in pregnancy. However, in literature, in 69% of infantile herpes zoster cases, the initial event could be traced to maternal varicella during pregnancy.<sup>12,13</sup> The reason of this difference could be a larger number of subclinical infections that go unnoticed in our population.

Historically, childhood herpes zoster was thought to be an indicator of underlying malignancy or immunosuppression.<sup>14</sup> However, studies indicate that only 3% of pediatric herpes zoster cases are associated with malignancies.<sup>3,9</sup> In our patients, majority (83%) showed no evidence of immunosuppression on history, examination and investigations. Ideally in childhood herpes zoster, lymphocyte counts, CD4/CD8 ratio and serum immunoglobulin levels should be estimated to rule out undetected concurrent immunosuppression. It was our limitation in not being able to perform these tests. However, of the 7 patients with underlying immunocompromised state, 3 had infection with hepatitis C virus, 2 were diagnosed as pulmonary tuberculosis. One patient was taking long-term steroids and one had recently been diagnosed with leukemia. Only one of these 7 patients gave a positive history of previous exposure to varicella infection. The anti-HCV positive patients had normal liver functions and size and texture of liver on sonography. The reason for lower number of immunocompromised patients in our study could be that our study population consisted of general dermatology OPD cases and patients from oncology and more sick pediatric patients were not included.

Generally, childhood herpes zoster is milder and shorter in duration than the adult variety.<sup>15</sup>

Clinical features include pruritus, pain, burning, fever and lymphadenopathy. Fifty two percent of our patients had pruritus as a symptom while 12% had pain which was severe in only 5%. Dermatomal involvement was predominantly thoracic (40%) and this was comparable with other studies.<sup>2,3,4,9</sup> Dissemination was seen in only one patient who otherwise had no evidence of immunosuppression. However, more than two dermatomes were involved in one patient who was diagnosed with leukemia. Incidence of postherpetic neuralgia is reported to be very rare in childhood cases.<sup>4,16</sup> Only 17 out of our 42 patients reported for follow up after 6 weeks of the eruption and none of them had pain as a symptom.

Due to the mild nature of disease in otherwise healthy children, antiviral therapy is usually reserved for immunocompromised children or children with evidence of dissemination of disease. Majority of patient respond well to symptomatic treatment. Patients with HIV infection are at a risk of developing severe illness from either varicella or zoster. Progressive primary varicella, a syndrome with persistent new lesion formation and visceral dissemination, may occur in HIV infected patients and may be life threatening.<sup>17</sup>

## **Conclusion**

Herpes zoster is increasingly being observed in children. Majority of these children show no evidence of immunosuppression and generally the disease is mild and of shorter duration than its adult variety.

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