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Etiology and Trends of Herpes Zoster in Immunocompetent Children

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Abstract: ***This study explores the rising incidence of Herpes Zoster (HZ), commonly known as shingles, in children, traditionally associated with older age and immunocompromised states. Contrary to past beliefs that linked childhood HZ to underlying malignancies, especially acute lymphocytic lukemia, recent findings indicate a broader occurrence in otherwise healthy children. The research presents four cases of HZ in children without prior varicella chickenpox infections, challenging the conventional understanding of its pathogenesis. These cases highlight the evolving nature of HZ, its occurrence in vaccinated, healthy children, and the need to reconsider its diagnostic and therapeutic approaches. The study also addresses the potential factors contributing to this shift, including changes in the immune response due to early life vaccination and varicella exposure, thereby expanding the clinical understanding of HZ in pediatric populations.***

Keywords: Herpes Zoster, Childhood Shingles, Varicella - Zoster Virus, Immunocompetent Children, Vaccine - Related HZ

1. Introduction

Herpes zoster or shingles occurs due to reactivation of VZV from dorsal root ganglia of sensory nerves. It is generally associated with old age and the incidence of herpes zoster increases with advancing age.1Childhood herpes zoster accounted for less than 1% of the total zoster cases in the past but recent reports have show an increase in the number of cases.2The incidence of HZ is 0.45 per 1000 in children below 14 years of age[3.] Earlier herpes zoster was considered to manifest only in immunocompromised or children with underlying malignancy. It was even thought to be an indicator of an underlying malignancy especially acute lymphocytic lukemia, however recent studies shown no increase in the incidence of malignancy in children.4 Although a majority of the patients with HZ have a previous medical history of varicella, or chickenpox, a small proportion of patients present with lesions of zoster without any prior history of varicella infections. In this case series we report the cases of 4 such children who presented with herpes zoster without any prior infection with varicella.

2. Description

Case 1: A13 year old girl presented with multiple fluid filled lesions on left side of forehead, left upper eye lid since 2 days. Lesions were insidious in onset and were associated with a moderate – severe intensity burning type of pain. There were no complaints of similar lesions in family or contacts there were no known co - morbidities. She was an otherwise healthy child with normal development and was fully vaccinated as per national immunization schedule up to date including the optional varicella vaccine.

On examination there were multiple welldefined grouped vesicles on an erythematous base on left side of forehead and upper eye lid. There were multiple erosions with crusting seen on the same area. A diagnosis of varicella was made and patient was started on tablet acyclovir and topical mupirocin.

Case 2: A 12 year old male presented with fluid filled lesions on abdomen and back since 3 days. Lesions were insidious in onset and gradually progressive. They were not associated with pain or itching. The mother gives history varicella in the child's elder brother when he was 6 months of age but there was no history of varicella in the child. He was fully immunized as per NIS including the optional varicella vaccine. Routine investigations were advised including a complete blood count and serology. The blood parameters were within normal limits and serology was negative. He was started on tablet acyclovir in a private clinic prior to presenting to our OPD. Acylclovir at 40mg/kg was continued for 7 days with topical antibiotic cream twice daily application for one week. He was reviewed after 1 week with good response to treatment.

Case 3: A 5 year old female child presented with multiple fluid filled skin lesions over left side of chest and back since since 3 days. Lesions were insidious in onset, gradually progressive and were not associated with pain or itching. There was history of contact with varicella in childhood when her brother developed infection, but patient did not develop similar lesions. Her antenatal history was uneventful. The child was vaccinated up to date as per NIS schedule and hadreceived the optional varicella vaccine. On examination there were multiple grouped vesicles on erythematous base distributed over left side of chest and back not crossing the midline involving the T3 dermatome. Routine blood investigations including a CBC and serology were performed and were within normal limits.

Case 4: A 13 year old male presented with multiple fluid filled skin lesions over left side of hip insidious in onset, gradually progressive. Lesions were not associated with pain/ itching He had no systemic complaints and no co - morbidities. Antenatal history was uneventful and patient

had no history of varicella infection in childhood. He was fully immunized as per national immunization schedule and had received the optional varicella vaccine. On examination there were multiple grouped vesicles on erythematous base over left side of chest and back not crossing the midline involving the T3 dermatome.

3. Discussion

HZ also known as shinglesis derived from the Latin word *cingulum*, meaning 'girdle'. This is due to the common presentation involving a unilateral rash around the waist or torso. The name zoster is derived from a Greek word, referring to a belt - like binding, known as a zoster used by warriors to secure armour[5].

It is caused by VZV belonging to the herpes virus family. It is a DNA virus measuring approximately 150–200 nm in diameter with a molecular weight of approximately 80 million. It is characterised by an icosahedral nucleocapsid surrounded by a lipid envelope and a double - stranded DNA located at its centre[6]

Herpes zoster, also known as shingles, is a condition caused by reactivation of the varicella zoster virus which remains dormant in the sensory ganglion. The reactivation first produces a prodrome of pain and paraesthesia following which develops a vesicular along the affected dermatome. It can be associated with hyperesthesia and hyperalgesia. Sometimes pain persists in the affected dermatome even after disappearance of the rash referred to as post herpetic neuralgia.[7]

Primary varicella is usually considered as a disease of childhood, whereas herpes zoster occurs more often in adults. However herpes zoster can affect younger children and when it affects tends to be less severe as compared to adults.[7]The incidence of HZ is approximately 0.45 per 1000 in children below 14 years of age as compared to 3.9–11.8 per year per among those older than 65 years.[8] Historically, childhood HZ was thought to occur only in children with underlying malignancy and was even considered as an indicator of acute lymphatic leukemia.[9]

Recently it has been proved that even healthy children with no malignancy or immunosuppression can develop herpes zoster. the increase in incidence of HZ in healthy children can be due to acquiring primary varicella infection *in utero*, or in infancy, wherein the immunity is not fully developed. All the cases studied in our report had an uneventful antenatal history.[10]

Vaccination with live attenuated virus may also contribute to development of HZ.3 All the 4 children studied in this report were vaccinated with the live attenuated vaccine. Tereda *et al*. stated that the immunological status at the time of acquiring the primary infection is the most important factor in childhood HZ. Low levels of lymphocytes, natural killer cells and cytokines are seen in infants. This may result in an inability to maintain latency of VZV, leading to early appearance of zoster in children.[10] Vaccinated children do not present with varicella however both vaccine - type and wild - type viruses remain dormant in sensory ganglia and can be reactivated during stress, trauma or malignancy.[11]

4. Conclusion

Herpes zoster results from the reactivation of a latent VZV infection and is rarely seen in healthy children. Varicella in early childhood is a risk factor of Herpes zoster (HZ) in immunocompromised and immunocompetent children. The appearance of HZ in a young child does not always imply an underlying immunodeficiency or malignancy. The identification of HZ with or without immunodeficiency is of prime importance from the treatment and prognostic point of view and should be considered in the differential diagnosis of vesicular eruptions

References

[1] Elmer KB, George RM. Herpes zoster in a seven month old infant. *Cutis*.1999; 63: 217–218.
[2] Prabhu S, Sripathi H, Gupta S, Prabhu M. Childhood herpes zoster: a clustering of ten cases. Indian J Dermatol.2009; 54 (1): 62 - 4. doi: 10.4103/0019 - 5154.48991. PMID: 20049274; PMCID: PMC2800875
[3] Quesada D, Morsky L, Aguìñiga - Navarrete P, Garrett MB. Pediatric Herpes Zoster. ClinPract Cases Emerg Med.2019 Dec 17; 4 (1): 32 - 34
[4] Katakam BK, Kiran G, Kumar U. A Prospective Study of Herpes Zoster in Children. Indian J Dermatol.2016 Sep - OQuesada D, Morsky L, Aguìñiga - Navarrete P, Garrett MB. Pediatric Herpes Zoster. ClinPract Cases Emerg Med.2019 Dec 17; 4 (1): 32 - 34
[5] Roxas M. Herpes zoster, postherpetic neuralgia. Diagnosis and therapeutic considerations. *Altern Med Rev* 2006; 11: 102–13 [PubMed] [Google Scholar]
[6] Hambleton S, Gershon AA. Preventing varicella - zoster disease. *ClinMicrobiol Rev* 2005; 18: 70–80
[7] Nurmikko T. Clinical features and pathophysiologic mechanisms of postherpetic neuralgia. *Neurology*
[8] Pahud BA, Glaser CA, Dekker CL, Arvin AM, Schmid DS. Varicella zoster disease of the central nervous system: Epidemiological, clinical, and laboratory features 10 years after the introduction of the varicella vaccine. *J Infect Dis.*2011; 203: 316–23
[9] Katakam BK, Kiran G, Kumar U. A Prospective Study of Herpes Zoster in Children. Indian J Dermatol.2016 Sep - Oct; 61 (5): 534 - 9
[10] Bader MS. Herpes zoster: Diagnostic, therapeutic, and preventive approaches. *Postgrad Med.*2013; 125: 78–91. [PubMed] [Google Scholar]
[11] Quesada D, Morsky L, Aguìñiga - Navarrete P, Garrett MB. Pediatric Herpes Zoster. ClinPract Cases Emerg Med.2019 Dec 17; 4 (1): 32 - 34

Figure 1: A13 year old girl with herpes zoster ophthalmicus

Figure 2: A 12 year old male with herpes zoster of T8, T9 dermatome

Figure 3: A 5 year old child with H involving T2 dermatome

Figure 4: A 13 year old male with HZ involving L1 dermatome