HERPES ZOSTER IN CHILDREN

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ABSTRACT

Objective: The aim of this study was to describe the epidemiology, clinical manifestations, therapy and outcome of herpes zoster in children.

Methods: The medical records of 21 patients with herpes zoster who were referred to the dermatology clinic between February 2003 and July 2005 were reviewed. The total numbers of patients were 12 males (57.1%) and nine females (42.9%). Their age ranged between 5 and 14 years. The diagnosis was made depending on history and the clinical manifestation. Aciclovir therapy was given systemically within three days of the onset of the exanthem.

Results: Amongst the 21 subjects, eight patients had underlying hematological malignancy in the form of acute lymphoblastic leukemia and these represent the immunocompromised group. The other 13 patients were otherwise healthy (immunocompetent group). Two children in the immunocompetent group were born to mothers who had varicella during pregnancy (intrauterine) at two and seven months of gestation. The other 11 patients had varicella under the age of four years and herpes zoster 4-8 years later. Among the immunocompromised children only two patients had varicella under the age of four years, they all had varicella before the appearance of malignancy, and all patients in this group had herpes zoster between the age of 9 -14 years.

Conclusion: Zoster is a rare disease in childhood. Varicella in early childhood is a risk factor of herpes zoster in immunocompromised and immunocompetent children. Most cases of childhood zoster occur in otherwise healthy children. The appearance of herpes zoster in a young child does not always imply an underlying immunodeficiency or malignancy. The prognosis is generally excellent.

Key words: Children, herpes zoster, varicella zoster virus

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Introduction

Herpes zoster (shingles) is an acute painful blistering cutaneous viral infection caused by reactivation of Varicella-Zoster virus (VZV). This herpes virus initially produces chickenpox. After the resolution of primary VZV infection (chickenpox), the virus remains dormant in the dorsal root ganglion, and may later undergo local dermatomal reactivation in the forum of herpes zoster.[1] Herpes zoster can occur in childhood but is more common and more severe in adults especially the elderly, the immunocompromised and cancer patients.[1,2]

Chickenpox or Zoster in the early months of pregnancy can harm the fetus, but this is rare. The fetus may be infected by chickenpox in later pregnancy, and then develop zoster as an infant.[1,3,4] Children commonly experience systemic symptoms before cutaneous lesions of zoster appear. The first symptom of shingles is usually pain which occasionally may be severe, in the areas of one or

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Table I. Demographic data and clinical manifestation among the study group

	Patient No.	Gender	Underlying disease	Onset of Varicella (yrs)	Onset of zoster (yrs)	Interval between zoster and varicella (yrs)
Immunocompromised group	1	F	ALL	unknown	12.5	——
	2	M	ALL	8.5	9	0.5
	3	F	ALL	5	11.5	6.5
	4	M	ALL	7	14	7
	5	F	ALL	8	11	3
	6	M	ALL	9	13	4
	7	F	ALL	10	12	2
	8	F	ALL	4	10	6
Immunocompetent group	Mean/total	5F / 3M		6.4	11.3	3.6
	1	M		4	8	4
	2	M		2.5	6.5	4
	3	M		Intrauterine	0.2	——
	4	M		4	11	7
	5	F		4	8	4
	6	M		1.5	9.5	8
	7	F		Intrauterine	0.6	——
	8	M		3	8	5
	9	M		2.5	6	3.5
	10	F		2.5	5	2.5
	11	F		3	6.5	3.5
	12	M		3	9	6
	13	M		3	7	4
	Mean\total	9M\4F		2.4	6.5	3.9

more sensory nerves.[3-5] The pain may be sharply localized to the same area, but may be more diffuse. The patients usually feel quite unwell with pruritus, low-grade fever, malaise, headache, and regional lymphoadenopathy. Within 1-3 days of the onset of pain, a blistering rash appears in the painful area of the skin.[4-6] Sometimes, especially in children, zoster is painless.[4,6,7] Because herpes zoster is a rare disease in children, the aim of this study was to describe the epidemiology, clinical manifestations, therapy and outcome of herpes zoster in immunocompromised and immunocompetent children.

Methods

The medical records of 21 patients with herpes zoster who were referred to the dermatology clinic at King Hussein Medical Center (KHMC) and Prince Rashid Bin Al-Hassan Hospital between February 2003 and July 2005 were reviewed. The total numbers of patient were 12 males (57.1%) and nine females (42.9%), and the age ranged from five to 14 years.

The diagnosis was made depending on history and clinical manifestation. Aciclovir therapy was given systemically within three days of the onset of the exanthem. Tzank smear was used sometimes to confirm the diagnosis. Laboratory investigations included blood cell count, leukocyte differential count, erythrocyte sedimentation rate, liver function tests, and chest radiography. Particular emphasis was given to dermatomal distribution of herpes zoster and to the determination of any close contact with a patient with varicella, presence of any underlying disease, number of fever episodes during the last year and the age of onset and severity of varicella as recalled by the mother. Disseminated herpes zoster was defined as herpes zoster lesions involving sites other than the main involved dermatome and its adjacent dermatomes. Varicella was defined as mild if the child had fewer than 50 lesions and no fever, moderate if the child had 50-200 lesions, and severe if the child had more than 200 lesions and a fever of more than 38°C. Aciclovir was given intravenously (10mg/kg/dose/IV q8h) or orally (10mg/kg/dose PO four times per day) for 7-10 days within three days of onset of shingles exanthem.

Results

Amongst the 21 subjects, eight patients had underlying hematological malignancy in the form of acute lymphoblastic leukemia (ALL) and these represented the immunocompromised group of children. The other 13 patients were otherwise healthy (immunocompetent group). Two patients in

the immunocompetent group were born to mothers who had varicella during pregnancy (intrauterine) at two and seven months of age. The other 11 patients had varicella under the age of four years and herpes zoster four to eight years later. Table I summarizes the demographic data and clinical manifestations among the study group.

Among the immunocompromised children only two patients had varicella under the age of four years, and they all had varicella before the appearance of malignancy, and all of them had herpes zoster between the ages of nine to 14 years.

The dermatomal distribution of the herpes zoster lesions among the study group was as follows: cervical (38.5%), thoracic (50%), and others (11.5%). Only one patient in the immunocompromised group and three patients in the immunocompetent group had mild to moderate pain and pruritus two to three days before the appearance and during the presence of herpes zoster lesions.

Follow up eight weeks after the lesions have healed showed that no patient had post-herpetic neuralgia. Among the immunocompromised group, lesions were more numerous, bullous and rather monomorphous (Figs. 1 and 2), and the lesions were disseminated in three patients. None of the patients had evidence of visceral dissemination.

The patients in the immunocompromised group received Aciclovir for seven to 10 days. The three patients with disseminated herpes received intravenous Aciclovir for three to five days, and then shifted to oral Aciclovir for another five to seven days. The patients in the immunocompetent group received oral Aciclovir for seven days. The duration of Aciclovir treatment was longer in immunocompromised patient, but the outcome was good among the whole study group.

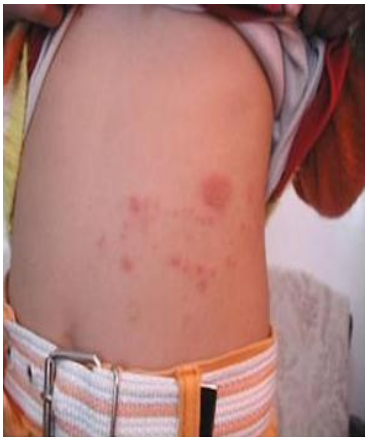

Fig. 1. Herpes zoster (thoracic distribution T7 to T10 dermatomes) in a seven year old immunocompetent child

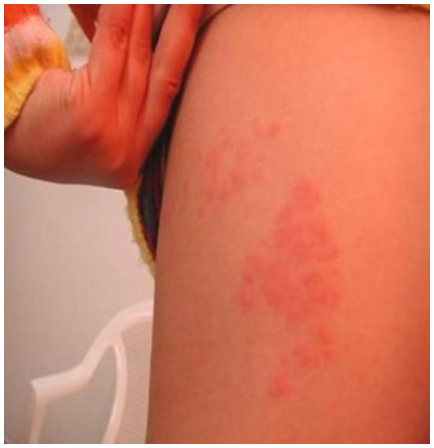

Fig. 2. Herpes zoster (thoracic distribution in T8 and T9 dermatomes) in a six year old immunocompromised child

Discussion

Clinically, herpes zoster often presents as pain of variable severity few days before an eruption starts as closely grouped red papules, rapidly becoming vesicular and then pustular, and develops in continuous or interrupted bands in the area of one, occasionally two, and rarely, more contiguous dermatomes.[5,6,8] It occurs first in the area closest to the central nervous system and then spreads along dermatomes until it reaches a point of maximum eruption at three to five days.[1-3] Mucous membranes within the affected dermatomes are also involved.[4,6,9] New lesions continue to appear for several days. Often in children, and occasionally in adults, the eruption is the first indication of the attack.[5,8,10]

The pain and general symptoms subside gradually as the eruption disappears.[4,9,11] In uncomplicated cases recovery is complete in two to three weeks in children and young adults and in three to four weeks in older and in immunocompromised patients.[6,8,12] Occasionally, pain is not followed by the shingles eruption "sine eruption".[7,10,13]

The chest (thoracic), neck (cervical), forehead (ophthalmic) and lumbosacral sensory nerves are the most commonly affected areas in order of frequency at all ages, but the frequency of ophthalmic shingles increases with age. Rarely, the eruptions may affect both sides of the body.[6,11,13] Generalized chickenpox-like eruption accompanying segmental zoster should raise suspicion of an underlying immunocompromised state or malignancy, particularly if the lesions are hemorrhagic or necrotic. In these cases healing may take many weeks and may be followed by scarring.[7,11,14]

Muscle weakness may occur, because the motor nerves might be affected as well as sensory nerves.[7,12,15] Post-herpetic neuralgia is defined as persistence and or recurrence of pain more than one month after the onset of shingles. It is unusual in childhood and increases in incidence and severity with age.[8,13,16,17]

The factors that induce VZV to reactivate are uncertain. These include: acute lymphocytic leukemia and other malignancies, immuno-compromised state as a result of treatment or HIV, intrauterine varicella exposure, and primary VZV infection that has occurred in the first year of life.[1-3]

Herpes zoster is a rare disease in childhood with a reported incidence of 0.74 per 1000 children under nine years of age. It usually occurs among immunocompromised children and in those who have had varicella either as intrauterine infection or in the first year of life. [3-5] The risk is significantly higher among immunocompromised patients. For example, children with leukemia have a 50-100 fold increased risk compared with nonimmuno-compromised children.[4,6,7]

When zoster occurs in a child, it may be a sign of a more serious underlying condition, such as immunodeficiency, lymphomas, leukemias and other malignancies, kidney transplant or bone marrow transplantation or some other elective immunosuppressive therapy. However, most cases of childhood herpes zoster occur in otherwise healthy children. Only 3% of pediatric herpes zoster occurs in children with an identifiable malignancy, and the disease poses no increased risk of cancer. In one study, none of the 22 healthy children with shingles who were observed for more than four years had a malignancy.[4,6,8] This incidence is much greater in our study (38.1%) mainly because of the nature of sampling as many cases of zoster in immunocompetent children are treated by the pediatricians and not referred to dermatologists.

Nevertheless, a few possibilities should be considered when contemplating the cause of shingles in a healthy child. Usually, a child who has shingles before the age of seven, he has had chickenpox in utero or during the first year of life. The levels of protective antibodies at that time are low, which suggests blunted immunologic response to VZV infection. Maternal antibody protection diminishes during the first four months of life, and the virus can reappear in the child as it does in an elderly person.[7-9] There are also some reports of a few cases of shingles due to reactivation of attenuated virus in the chickenpox vaccine designed to prevent shingles.[5,7,10]

It is important to remember that zoster can occur at any age, regardless of the immune status. Although uncommon in childhood, it nevertheless occurs and may be mistaken for other, more common rashes. Risk factors for the occurrence of zoster, in those younger than 18 years, include primary VZV infection before the first year of age and immunodeficiency. Infants may acquire VZV from the mother who contacts primary varicella during pregnancy. In such cases, the infant may have dermatomal vesicular lesions or scaring at the time of delivery.[7,9,11] Alternatively, some children may develop subsequent zoster without previous clinical evidence of chickenpox.[6,10,12]

Several studies have shown that herpes zoster in otherwise healthy children is most likely in those who had had varicella in the first year of life or had been infected in utero as a result of maternal infections.[8,9,13] Our findings are also in agreement with data reported in the literature.[9,11,14]

The lesions of zoster among immunocompromised children tend to be bullous and monomorphous in contrast to the lesions in immunocompetent children that were typical of varicella. Pain before and during the presence of herpes zoster lesions was experienced occasionally in our patients, but no one had post herpetic neuralgia.[12,13,15]

Treatment of zoster often includes supportive and symptomatic measures. The decision to initiate systemic treatment in a child may be based on immune suppression, dissemination of the disease, widespread involvement, facial involvement, where early treatment may prevent scarring, eye involvement, or acute pain.[13,15,16] A recent study showed that Aciclovir therapy at the time of diagnosis of herpes zoster prevented significant morbidity and mortality in immunocompromised children with herpes zoster.

In our study, the good outcome among the study group was attributed to the early administration of Aciclovir therapy.[15-18] No patient had visceral dissemination and no deaths occurred.[7,16,17] Early treatment may also prevent dissemination and post-herpetic neuralgia, although these are rarely a problem in healthy children. Therapy can also decrease the risk of secondary bacterial infections and complications that range from scarring to pericarditis.[16,17,19]

With systemic aciclovir therapy, the prognosis of herpes zoster in children is excellent. The illness is

of short duration and resolves completely, but lasts longer in immunocompromised patients.[7,16,19]

Conclusion

Zoster is a rare disease in childhood. Varicella in early childhood is a risk factor of herpes zoster in immunocompromised and immunocompetent children. Most cases of childhood shingles occur in otherwise healthy children. The appearance of zoster in young children does not always imply an underlying immunodeficiency or malignancy. The prognosis in a healthy child is excellent. Systemic Aciclovir within three days of onset of the skin lesions prevents significant morbidity and mortality among childhood zoster patients.

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