



Herpes zoster experience in two pediatric infection clinics

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Summary

Aim: Herpes zoster (HZ) is a vesicular cutaneous infection caused by reactivation of the latent varicella-zoster virus from dorsal root ganglia. It is characterized by dermatome distribution. It is usually seen in the elderly and pediatric zoster is rare. In this study we evaluated 16 patients who were admitted to our pediatric clinic and diagnosed as HZ.

Material and Method: Sixteen patients aged between 12 months and 17 years who were admitted to Ege University Medical Faculty Children Hospital and Tepecik Education and Research Hospital Pediatric Infection departments between January 2010 and September 2011 were evaluated retrospectively. Previous varicella disease, varicella vaccination history, existing chronic disease, immunodeficiency, immunosuppressive drug use, trauma, history of operation, history of radiation and presence of stress were questioned.

Results: Nine of 16 patients who were diagnosed as HZ were female. Three patients had lumbar involvement, six had thoracic involvement, one had disseminated involvement, four had trigeminal involvement, one had cervical involvement and one had sacral involvement. All patients received systemic and local treatment. No complication was observed.

Conclusions: Herpes zoster may be observed in children with or without immune suppression. The disease is benign in healthy children. Complications are rare. (*Turk Arch Ped* 2013; 48: 40-43)

Key words: Children, herpes zoster, immunosuppression

Introduction

Herpes zoster (HZ) infection occurs as a result of reactivation of the latent varicella zoster virus (VZV) located in the dorsal root ganglia. The disease can develop at any time after the primary infection. In 2% of the patients exposed to varicella zoster virus prenatally, chickenpox develops subclinically and these patients have a risk of development of postnatal HZ infection (1).

Since the varicella vaccine is an attenuated vaccine, herpes zoster may develop in vaccinated individuals. The risk of development of HZ after chickenpox is 20-63/100 000/year. In vaccinated individuals this risk is 14/100 000/year. Immune deficiency, immunosuppressive treatment and aging increase the risk of HZ infection. It occurs rarely below the age of ten. The disease involves the cervical and sacral regions in children and lower thoracic region, upper lumbar region and trigeminal nerve in adults. Complications include secondary bacterial infection, depigmentation, development of scar and herpes zoster neuralgia (HZN) (2). In children, eruption, pain and HSN occur

more rarely (3). The patients are contagious. In treatment, acyclovir or famcyclovir or valacyclovir may be preferred. In individuals with immunosuppression, it may recur and need treatment (2). The aim of this study is to determine the characteristics of HZ in children with and without immunosuppression.

Material and Method

16 patients aged between 12 months and 17 years (mean age 7.3±sd) who were diagnosed as HZ infection and hospitalized in pediatric infection clinics in Ege University Medical Faculty and The Ministry of Health Tepecik Education and Research Hospital were examined retrospectively. 9 of the patients (56.25%) were hospitalized in the Ministry of Health Tepecik Education and research Hospital and 7 (43.75%) were hospitalized in Ege University Medical Faculty. Chickenpox history, history of chickenpox vaccination, existing chronic diseases, immune deficiency, use of immunosuppressant drugs,

Table 1. Significant characteristics of the subjects diagnosed as Herpes zoster infection accompanied by chronic disease

Age (years)	Gender	Chronic disease	Vaccination	Dermatome	Hospitalization time (days)
9	Male	Liver transplantation	None	Thoracic	4
11	Female	Vitiligo	None	Trigeminal	13
17	Male	ALL-2008	None	Toracic	9
4	Female	Ewing sarcoma	None	Cervical	4
13	Female	Neuroblastoma	None	Lumbar	9

trauma, operation, history of radiation and presence of stress were interrogated in the patients. The dermatom distribution of the eruptions was determined. The patients were followed up in terms of complications.

Results

9 of 16 patients who were diagnosed as herpes zoster were female and 7 were male. The female/male ratio was found to be 1.28. Three patients had lumbar, six had thoracic, one had cervical, one had multiple dermatomal, four had trigeminal and one had sacral involvement. All patients received systemic and local treatment. Eight patients (50%) had a history of chickenpox diagnosed by a physician.

Six of the patients (32.5%) had thoracic, four (25%) had trigeminal, three had lumbar, one had cervical, one had sacral and one had diffuse eruption (Table 1). When the complaints at the time of presentation were questioned, vesicular eruption was found in 15 patients (93.7%). Four of these had pain and one had pruritus.

All of the patients had been hospitalized in the ward. Acyclovir treatment was started in all patients intravenously and topically. Supportive treatment (antipruritic, analgesic) was given.

The patients were followed up in terms of complications. Keratitis developed in one of four patients who had trigeminal involvement and soft tissue infection developed in four patients. In the follow-up, pain developed in 11 patients and analgesia was needed. Pain decreased with paracetamol and ibuprofen in nine patients and with tramadol in two patients. Presence of chronic diseases and malignancy, trauma, use of immunosuppressive drugs, history of immune deficiency, surgical intervention and history of stress were interrogated in the patients. No history of immune deficiency, malignancy, use of immunosuppressive drug, trauma and surgical intervention was found in the patients. In six patients, a history of stress (emotional, long-term sun exposure) was given as an enhancing factor. In addition, four patients were using immunosuppressive drugs because of acute lymphoblastic leukemia, Ewing sarcoma, neuroblastoma and liver transplantation. It was reported that varicella vaccine was administered at the age of 22 months in one patient. No contact with a patient with zona was reported (Table 1 and 2).

When the seasons of infection were evaluated, it was found that seven patients (43.75%) developed infection in summer, four

Table 2. Significant characteristics of the healthy subjects diagnosed as Herpes zoster infection

Age (years)	Gender	Vaccination	Dermatome	Hospitalization time (days)
4	Female	None	Trigeminal	6
2	Male	None	Trigeminal	5
4	Female	(+)	Thoracic	10
9	Female	None	Sacral	9
3	Female	None	Thoracic	6
10	Female	None	Lomber	10
3	Female	None	Torakal	9
2	Male	None	Lumbar	10
1	Male	None	Diffuse	4
8	Male	None	Thoracic	4
17	Female	None	Trigeminal	9

(25%) developed infection in fall, three (18.75%) developed infection in spring and two (12.5%) developed infection in winter.

Vesicles developed on the back in six (37.5%) of the patients with zona, in the eye in four (25%), on the abdomen in three (18.75%), on the extremity in one (6.25%), on the neck in one (6.25%), on the hip in one (6.25%) and dissemination was found in one patient. 15 patients had unilateral involvement.

The mean leukocyte count of the patients was found to be 7740 mm³ (the least-the highest: 1310-16800 mm³), the mean lymphocyte count was found to be 3779 mm³ (the least-the highest: 330-10400), the mean neutrophil count was found to be 3230 (the least-the highest: 840-4500 mm³). Lymphopenia (<2000 mm³) was found in six patients. The mean time of eruption was 6 days (the least-th highest: 4-13). Fever was observed only in the patient with keratitis. In addition, lymphopenia (170 mm³) and a history of vitiligo were reported in the same patient.

The mean time of hospitalization was 7.31 days (the least-the highest: 4-13) in all patients, 8.3 days in patients with eye involvement and 5.7 days in patients who used immunosuppressive drugs or who had malignancy. The mean time of acyclovir treatment was found to be 8,06 days (the least-the

highest: 4-14). Two patients switched to oral consecutive valacyclovir treatment. No side effect related to acyclovir was observed.

Discussion

Herpes zoster infection typically occurs in adults (4,5). While chickenpox is usually observed in children aged 5-9 years, HZ infection usually occurs in people above the age of 50 years. While the frequency of HZ infection is 0,45/1000/year in children aged 0-14 years, it is 4.2-4.5/1000 people/year in individuals above the age of 75 years (4,5). The majority of patients who have HZ in the childhood are above the age of 5 and a great part of these patients have a history of in utero chickenpox or chickenpox below the age of one or a history of exposure to chickenpox (4,5). In our study, the age of the patients diagnosed as HZ infection ranged between 12 months and 17 years (mean: 7.3 years) which was compatible with the literature (6). In a study performed in Japan, it was reported that HZ infection showed a peak at the age of 4-5 and 10-11 years in children with a normal immune system. The female/male ratio was found to be near to 1 and compatible with the literature (6).

Studies have reported that HZ infection can develop at a young age in children exposed to varicella zoster virus prenatally or in the first year of life (6). One of our patients was 12 months old and it was reported he did not have chickenpox. In a study performed by Kurlan et al. (6), development of HZ infection was reported in patients aged four months old and seven months old. It was reported that these patients had contact with people with chickenpox during the newborn period and presented with HZ infection without having chickenpox themselves. This was explained with inadequate cellular immune response due to immature immune system.

One of the characteristics of Herpes zoster infection is presence of pain before development of eruption and presence of pain in that dermatome after development of eruption. However, pain is less severe and less frequent in HZ infection in the childhood. Different views about pain which develops during infection have been reported. Although the rate of pain was low in our study, some publications have reported a rate of 40% (6).

The virus most frequently affects the dermatomes between T3 and L3 (thoracic 75%, lumbar 11%). In some studies, a high rate of trigeminal involvement has been reported (4,5,6,7). Thoracic involvement was found in 6 of our patients (32.5%), trigeminal involvement was found in four (25%) and lumbar involvement was found in three (18.75%). Extensive dermatomal involvement was found in one patient.

It is known that virus specific cellular immunity is important in controlling of viral activation and dissemination. Therefore, VZV infection may have a more severe course in individuals with suppressed immunity. In hematologic malignancies, cellular immunity is damaged in two ways by the effects of both the malignancy itself and the chemotherapeutics. Other risk factors reported include other malignancies, HIV infection, organ transplantation, trauma, chronic steroid usage, immunosuppressive therapies, chronic renal failure and chronic

respiratory problems. Chronic psychological stress has been reported to decrease cellular immunity response and thus enhance development of HZ infection (6,8,9,10). Use of immunosuppressant (tacrolimus) because of acute lymphoblastic leukemia, Ewing sarcoma, neuroblastoma and liver transplantation was present in our patients. The ages at the time of chickenpox could not be calculated, since they were not reported in medical history.

Postherpetic neuralgia is the most common complication. Its cause is not known. Its possibility increases as the age gets older. It is observed 1-6 months after HZ infection (6,7). HSN did not develop in our patients. HSN was not observed in the patient group consisting of 15 patients studied in Turkey. In addition, it was observed in only one patient with no immune deficiency in a series consisting of 244 patients (6,7). Complications including motor weakness and visceral involvement may occur, though rarely. No complication was observed in our patient which was compatible with the literature. Complications occur more frequently in patients with immune deficiency; multiple dermatomes are involved and hemorrhagic vesicles may be observed. Absence of such cases in our study may be related with the low number of patients.

The cranial nerves are involved in 10-15% of the children with herpes zoster infection and ophthalmic signs (konjonktivits, ulcerative keratitis, uveitis etc.) are present in 50% of the patients with involvement of the trigeminal nerve. Ophthalmic complications are observed especially when vesicular lesions are extended to the tip of the nose. HZ lesions appear unilaterally on the forehead, palpebrae and scalp. In addition, vesicles are observed on the sides and tip of the nose and this is called as Hutchinson sign. Damage to the nerve, ocular and orbital tissues results from chronic inflammation or directly from viral infection. This was found in one of our four patients who had ophthalmic involvement. All patients had conjunctival hyperemia and this was limited with the frontal dermatome. It was stated that the orbital movements were painful at presentation and corneal sensitivity was found. It was stated that none of the patients was vaccinated. No permanent sequela occurred in the long-term. Absence of sequela may be explained by the low number of patients or timely administration of intravenous acyclovir and supportive treatment (4,5,11). Interestingly, the mean hospitalization time of this group (7.31 days) was found to be longer compared to the immunocompromized patients (5.7 days). It was thought that this difference might be explained by the inadequate number of patients.

The disease is rarely observed in healthy children and usually recovers without complication. In some studies, complications including aseptic meningitis, extension of the eruption and facial palsy have been reported in healthy children (4). It is generally accepted that the disease recovers in 1-3 weeks without complication, antiviral treatment is not needed and supportive treatment is adequate. However, antiviral treatment is recommended in presence of acute zoster pain, cranial nerve involvement, disseminated zoster infection, hereditary or acquired immune deficiencies and atopic dermatitis. Antiviral drugs used in HZ treatment in adults include acyclovir,

valacyclovir, famcyclovir and brivudine. In our country, acyclovir and valacyclovir have been approved for use in the childhood. It has been reported that early antiviral treatment decreases the disease time and pain after zoster infection (4).

The treatment period is seven days or until 2 days later after new lesion appearance stops. Our patients recovered with acyclovir and supportive treatment without permanent sequelae (4). If acyclovir is started 72 hours after the signs begin, it speeds recovery and decreases pain (5).

Conclusively, HZ infection is generally observed in children who receive chemotherapy or who have immune deficiency, though it may rarely occur in healthy children. Trigeminal involvement is considerably rare in children and generally has a benign course. Acyclovir (30 mg/kg/day, 3 doses, intravenous) and supportive therapy are adequate in treatment (4).

HZ infection may recur especially in immunocompromized patients (1-4%). No recurrence was observed in the follow-up in our patients (12,13,14).

Vaccination was reported only in one of our patients, because this vaccine is not included in the vaccination schedule of the Ministry of Health. However, detailed studies are needed for this subject. The superiority of vaccination is that a weaker strain is latent instead of a wild strain. This is especially important with the increased risk of HZ infection in adult transplantation cases (11,15).

Conclusively, HZ infections may be observed in healthy children, though it occurs more frequently in immunocompromized children. In children, treatment is recommended to prevent dissemination in immunocompromized ones and to prevent development of keratitis in trigeminal involvement. It has a benign prognosis in patients with a normal immune system. Since herpes zoster infection occurs rarely in children, the patient numbers are generally low in studies. More studies are needed in terms of disease and treatment approaches.

Conflict of interest: None declared.

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