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Herpes zoster after vaccination with one dose varicella vaccine to a 4-year-old child

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SUMMARY

Clinical observations from the international literature report that herpes zoster occurs after varicella vaccination in immunocompetent children.
We present the case of a four-year-old immunocompetent girl who developed herpes zoster after she had received one dose of varicella-zoster virus live attenuated vaccine at the age of 15 months. Continued surveillance for herpes zoster among vaccinated persons is important to evaluate the varicella vaccination program and to detect any changes in the epidemiology of herpes zoster. Vaccinated children appear to have a lower risk of herpes zoster than people who were infected naturally with varicella zoster virus (chickenpox).

Keywords: Herpes zoster, varicella, vaccine.

INTRODUCTION

Varicella-zoster virus infection causes two clinical syndromes. Primary varicella infection results in chickenpox, a contagious rash illness typically seen among children. Varicella-zoster virus (VZV) can reactivate years after the initial infection to cause herpes zoster. A vaccine against varicella was introduced in 1995 using live attenuated virus [1]. One dose of VZV vaccine is approximately 85% effective for preventing any severity of varicella and >95% effective against combined moderate and severe varicella. The second dose of the vaccine provides additional protection against secondary infection [2]. Rarely, in immunocompetent children VZV reactivates within the same dermatome where the vaccine injection was administered and causes herpes zoster [3]. We report a 4-year-old girl who developed herpes zoster after one dose VZV vaccination who was administered at the age of 15 months.

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CASE PRESENTATION

A four-year-old girl presented with a painful vesicular rash on her right arm, spreading over C4, C5 and T1 dermatomes. She had received one dose of VZV vaccine (Varivax-Oka strain) at the age of 15 months. She was fully immunized in terms of other vaccinations. There was no known contact with varicella. Screening was negative for varicella IgM antibodies (Serion Elisa Classic Varicella kit-Serion Wurzburg, Germany). She was afebrile and otherwise well. The child was immunocompetent, with no history of frequent or unusual infections. She was initially treated with a combination of fusidic acid and betamethasone as topical cream. Two days later she returned because she had developed further lesions on her arm and she was complaining of severe pain and headache. Herpes zoster was clinically diagnosed

and treatment with acyclovir and analgesics was given for ten days. Eosin as lotion also was applied to the skin. The lesions started to crust two days after treatment was commenced and gradually pain subsided, and the child recovered completely without any further complications.

DISCUSSION

A vaccine containing live-attenuated VZV (named Oka strain) was developed in Japan in the early 1970s [4]. The vaccine is available as a single-antigen vaccine or in combination with measles, mumps, and rubella (MMRV). Universal vaccination with the live attenuated VZV vaccine was first introduced in Greece in 2004. A single dose of the vaccine was recommended for children 15 months old children. In 2008 a two-dose schedule was introduced for 12-15 months and 4-6 years old. Herpes zoster is rare in childhood, with an incidence of 0.74 per 1000 in children younger than 9 years of age [5]. It almost always occurs in immunocompromised children and in those who have had a primary intrauterine infection or varicella in the first year of life [6]. Herpes zoster can also develop after vaccination, with an incidence of approximately 14 cases per 100,000 person per year [7, 8]. Two hundred and five cases of herpes zoster were reported after the administration of 16.1 million doses of Varivax, 143 of those patients with a known age were children >5 years of age [9]. Another study in immunocompetent children who had previously received varicella vaccine identified important decline of herpes zoster after the vaccination [10]. Early studies in leukemic children indicated that the risk of H. zoster is decreased by re-exposure to VZV, either through vaccination or through close exposure to varicella [11]. In Greece there are only limited published data on the incidence of H. zoster in children after vaccination. Plachouri et al. reported a case of an eleven years old child who developed herpes zoster followed two doses of the vaccine [12]. Our case is the first patient younger than 5 years of age who developed herpes zoster since universal VZV vaccine introduction in National Immunization program of Greece since 2004. Moreover, it shows that even one dose of vaccine may precipitate such event. VZV vaccines are highly effective at preventing disease but herpes zoster may occur among vaccinated people even among immunocompetent young children. Further studies needed to examine the effect of vaccination on the epidemiology of herpes zoster virus in Greece, a country where the socioec-

Figure 1 - Rash spread at dermatome T1.

Figure 2 - Vesicular rash on right arm.

onomic status after the financial crisis is changing rapidly. Physicians and the Public Health authorities must be in alert and observe the incidence of vaccines preventable diseases.

Conflict of interest
None.

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REFERENCES

[1] Marin M., Güris D., Chaves S.S., Schmid S., Seward-det F.J. Prevention of varicella: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm. Rep.* 56, (RR-4), 1-40, 2007.
[2] Shapiro E.D.,Vazquez M., Esposito D., et al. Effectiveness of 2 doses of varicella vaccine in children. *J. Infect. Dis.* 203, 3, 312-315, 2011.
[3] Weinmann S., Chun C., Schmid D.S., et al. Incidence and clinical characteristics of herpes zoster among children in the varicella vaccine era, 2005-2009. *J. Infect. Dis.* 208, 11, 1859-1868, 2013.
[4] Takahashi M., Otsuka T., Okuno Y., Asano Y., Yazaki T. Live vaccine used to prevent the spread of varicella in children in hospital. *Lancet* 2, 7892, 1288-1290, 1974.
[5] Hope-Simpson R.E. The nature of herpes zoster: a long-term study and a new hypothesis. *Proc. R. Soc. Med.* 58, 9-20, 1965.
[6] Baba K., Yabuuchi H., Takahashi M., Ogra P. Increased incidence of herpes zoster in normal children infected with varicella zoster virus during infancy: community-based follow-up study. *J. Pediatr.* 108, 3, 372-377, 1986.
[7] Leung A.K, Robson W.L, Leong A.G. Herpes zoster in childhood. *J. Pediatr. Health Care* 20, 5, 300-303, 2006.
[8] Takayama N., Takayama M., Takita J. Herpes zoster in healthy children immunized with varicella vaccine. *Pediatr. Infect. Dis. J.* 19, 2, 169-170, 2000.
[9] Sharrar R.G., La Russa P., Galea S.A., et al.The post-marketing safety profile of varicella vaccine. *Vaccine* 19, 7-8, 916-923, 2000.
[10] Civen R., Chaves S.S., Jumaan A., et al. The incidence and clinical characteristics of herpes zoster among children and adolescents after implementation of varicella vaccination. *Pediatr. Infect. Dis. J.* 28, 11, 954-959, 2009.
[11] Gershon A.A., LaRussa P., Steinberg S., Mervish N., Lo S.H., Meier P. The protective effect of immunologic boosting against zoster: an analysis in leukemic children who were vaccinated against chickenpox. *J. Infect. Dis.* 173, 2, 450-453, 1996.
[12] Plachouri K.M., Gkentzi D., Varvarigou A., Georgiou S., Dimitriou G. Herpes zoster onset 9 years after first varicella zoster vaccination in a 11 year old child: a case report. *Curr. Pediatr. Rev.* 2019. doi: 10.2174/1573396315666190318163927.