Chickenpox Appearing in Previously Vaccinated Individuals

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Introduction

Chicken pox is an acute, highly infectious disease caused by varicella-zoster virus. It occurs primarily among children under ten years of age. One attack gives durable immunity and second attacks are rare [1]. Varicella vaccine (OKA strain) is available in the Indian market. Reports of varicella outbreaks in highly immunized groups in USA and Japan have also increased concerns about the effectiveness of varicella vaccine. We came across four cases of chicken pox in children who were already immunized with varicella vaccine, which prompted us to report these cases.

Case Report

The first case, an 11 years old female, presented with skin rash of four days duration. She gave history of having fever for a day on the day of appearance of skin rash. She denied any history of any drug intake prior to appearance of skin rash or any respiratory, bowel or urinary symptoms. She gave history of contact with a known case of chicken pox in a child in her school. Parents of the child gave history of getting the child vaccinated with varicella vaccine at the age of two years. General physical and systemic examination on the day of presentation did not reveal any abnormality. Dermatological examination revealed numerous polymorphic skin lesions in various stages of development like macules, papules, vesicles, pustules and crusted lesions over the face, neck, chest, abdomen and scalp in bilaterally symmetrical distribution (Fig.1). Few erythematous erosions were also present on oral mucosa. The case was diagnosed clinically as 'chicken pox' and managed symptomatically with calamina lotion and anti histaminics. The lesions dried up, formed scabs and healed in about 10- 14 days.

The second case, a seven years old male child and brother of the first case, developed similar illness followed by appearance of skin rash about two weeks after exposure to the first case. The child also was immunized with varicella vaccine at the age of three years. This case was also clinically diagnosed as chicken pox and managed symptomatically. The

course of disease was similar to that in first case.

The third case, a ten years old female child and a cousin of first two cases also developed illness consistent with chicken pox about 15 days after exposure to second case and had similar disease progression (Fig.2). This case was also immunized with varicella vaccine at the age of three years.

Fourth case, a five years old male child who has already been vaccinated with varicella vaccine at the age of two years developed illness consistent with chicken pox. There was no definite history of exposure to any known case of chicken pox, though there had been many cases of chicken pox in the station where his parents were serving. However in this case the skin rashes were relatively less in number and started healing early.

Discussion

No vaccine has perfect efficacy, but varicella vaccine nearly always protects against severe varicella. Three post licensure studies have demonstrated vaccine effectiveness in the range of 85% to 90% for prevention of all disease and 100% for prevention of severe disease. Currently, approximately 1 in 10 vaccinated children may develop mild breakthrough disease following exposure to chickenpox [2]. Rashes, usually vesicular, account for more than half of all reports. Of the 1260 reports of possible vaccine failure (12.9/100,000) in the study by Wise et al [2], 51% described rash and nine patients had complications, particularly secondary bacterial infections of vesicles. Negative serologic tests, rather than varicella infections, seemed to prompt 17% of the reported possible vaccine failure [2].

A chickenpox outbreak occurred in a school at Oregon, USA in 2000 in which 97% of students without a prior history of chickenpox were vaccinated. Students vaccinated more than five years before the outbreak were at risk for breakthrough disease. Vaccine effectiveness was found to be 72% (95% confidence interval: 3%-87%) [3].

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Fig. 1 : First case showing vesicles and pustules on the thighs

Incidence of breakthrough varicella may be partly explained by the regional epidemiology of varicella. The decrease in annual incidence with time after vaccination may be due to the following reasons: some vaccinees remained free from breakthrough varicella owing to reinforcement of their immunity from subclinical infection of varicella-zoster virus and others from diminution of opportunity for exposure to varicella-zoster virus with increasing age. Varicella vaccine seems to be effective in modifying the symptoms of varicella, but not potent enough in protecting from VZV infection [4]. Humoral antibody persistence following vaccination is another determinant of risk of breakthrough varicella [5].

There are no studies from India about breakthrough varicella to the best of our knowledge. Widespread use of this vaccine by private practitioners is likely to change the epidemiological pattern of this disease, shifting it from early childhood to adolescents or young adults [1]. However, there is a need to carry out further studies to establish the effect of varicella vaccination on the disease pattern in Indian population.

Fig. 2 : Third case showing pustules on the legs

Conflicts of Interest

None identified

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