

## Erythema multiforme following vaccination in an infant

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### ABSTRACT

Erythema multiforme is a cutaneous reaction pattern precipitated by varied agents, notably herpes simplex and drugs. It predominantly occurs in adolescents and young adults but may be seen at other ages also. While vaccination is rarely a precipitating factor for erythema multiforme, it may occasionally be seen in infants and children. We report here a case of a two month-old infant with lesions of erythema multiforme minor appearing after two weeks following vaccination for DPT, Hepatitis B and influenza.

**Key Words:** Erythema multiforme, Infant, Iatrogenic, Drug eruption, Adverse drug reaction

### INTRODUCTION

Immunization is mandatory for all infants and children for the prevention of various diseases under the Universal Immunization Program. These vaccine-preventable diseases have declined markedly worldwide since the introduction of the routine immunization program in 1978, which was later upgraded in 1985 as the Universal Immunization Program.<sup>[1]</sup> The majority of adverse events following immunization (AEFI) are nonserious - fever and pain with reaction at the injection site. Serious reactions like anaphylaxis are rare; there has been only one case report out of 450,000 vaccine doses and these reactions are very rarely life-threatening events.<sup>[2]</sup> Severe AEFI include anaphylaxis with hepatitis B; thrombocytopenia and death from anaphylaxis or disseminated disease in immunocompromised persons with measles; chronic encephalopathy with triple (DPT) and Guillain-Barré syndrome, brachial neuritis and death from anaphylaxis with tetanus toxoid.<sup>[3]</sup> Localized cutaneous reactions are also observed with a few vaccines. We report here a case of erythema multiforme in a two month-old infant who presented to our outpatient department after her vaccination.

### CASE HISTORY

A healthy two month-old female child delivered by full-term,

normal vaginal delivery presented with multiple annular plaques on the acral parts of her body, which had been present since six days. The lesions started as papules, were few in number and progressed rapidly to involve both hands and feet in a short span of time. The lesions further enlarged to form annular plaques; there were no systemic complaints. The child was vaccinated two weeks earlier with a combination vaccine (administered at six weeks of age). There was no history of any other preceding illness in the child or the mother.

Multiple papules and plaques were found to be distributed bilaterally on the hands and feet [Figures 1 and 2] involving both surfaces. The plaques were of variable size, well defined with erythematous, raised margins and violaceous, depressed centers. Other body parts and the mucosal surfaces were spared. The child had received BCG vaccination after birth and the first dose of oral polio and a combination vaccine containing diphtheria, pertussis, tetanus (DPT), hepatitis B and influenza, at six weeks of age. Skin biopsy showed focally ulcerated lining epithelium with necrotic keratinocytes and degeneration of the basal cell layer with evidence of early vesicle formation in the epidermis. The papillary dermis showed edema with moderate inflammation in the perivascular area, as well as focal vasculitic changes.

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Figure 1: Target lesions on dorsum of hand



Figure 2: Target lesions on soles

## DISCUSSION

Erythema multiforme is a cutaneous reaction pattern to many infective or noninfective agents.<sup>[4]</sup> Various other known causes include radiocontrast media, drugs and vaccination. It is known to occur at all ages but is predominantly seen in adolescents and young adults. It is rarely seen under the age of three years and over the age of 50 years.<sup>[5]</sup> As children are exposed to vaccines early in their life, vaccines may be the most frequent cause for erythema multiforme. Although there are a few case reports of erythema multiforme following vaccination in literature, the exact incidence of such cutaneous reactions has not been determined.

Combination vaccines have been in use for more than 50 years. They simplify the process of vaccination and have improved the health of children.<sup>[6]</sup> Licensed combination vaccines undergo extensive testing for safety and efficacy before approval for their use.

Two cases of erythema multiforme have been reported with combination vaccines - one vaccine comprising of tetanus and diphtheria as vaccinating agents and the other vaccine containing diphtheria, tetanus, acellular pertussis, inactivated polio and hemophilus type B. As diphtheria and tetanus toxoid were the common components for both combination vaccines, they were regarded as potential precipitating factors that caused erythema multiforme.<sup>[7]</sup> Hepatitis-B vaccine has also been reported as cause for erythema multiforme.<sup>[8,9]</sup> Erythema multiforme has also followed meningitis and smallpox vaccination in a few cases.<sup>[10]</sup> A severe form of erythema multiforme major, *i.e.*, Stevens-Johnson syndrome has been known to occur with smallpox, anthrax and tetanus vaccines.<sup>[11]</sup>

In our case, the child had received a combination vaccine containing five different agents. The lesions of erythema multiforme appeared approximately two weeks after receiving the first dose of this vaccine, indicating the development of an immunological hypersensitivity reaction. A temporal correlation with the vaccine was established as there was no preceding illness in either the child or the mother that could be held responsible for such an eruption. It is difficult in our case to find the exact causative component of this combination vaccine. This distinct cutaneous reaction indicates the potential for serious cutaneous complication such as Stevens-Johnson syndrome, which could occur upon re-challenge with a booster dose.

There is a paucity of information regarding administration of booster doses in children. An Australian study that reviewed revaccination of 970 children with booster doses found that 469 children had experienced a past AEFI; 293 had only a minor reaction while 176 had experienced a significant neurological or allergic reaction. The majority (421/469) of these children were revaccinated and only one child developed a significant neurologic event that was transient and resolved spontaneously.<sup>[12]</sup> An AEFI, with the exception of anaphylaxis and encephalopathy, is no longer considered an absolute contraindication to continuing vaccination with the suspect vaccine. In conclusion, the use of booster doses to revaccinate children with a past history of AEFI, appears to be safe.

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