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Anaphylaxis to TDaP vaccine in an infant with IgE mediated cow's milk allergy

Abstract

Food allergy is an increasing health problem world-wide. CMA is one of the most common food allergies during childhood. Certain vaccines such as TDaP may contain milk protein residues that have been associated to severe allergic reactions among patients with proven IgE mediated CMA and receiving booster vaccination. We present an infant with IgE mediated CMA who presented anaphylaxis when receiving a booster dose of TDaP. The possibility of an allergic reaction to certain vaccines in a small group of children suffering from IgE mediated CMA should be discussed with caregivers and health professionals to better care of these patients.

Keywords: vaccine allergy, cow's milk allergy, anaphylaxis, ige, cma, allergy

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Abbreviations: CMA, cow´s milk allergy; TDaP, diphteria, tetanus, acelular perstussis; IPV, inactivated polio virus

Introduction

Food allergy is increasing worldwide and our country is not an exception,[1] cow´s milk allergy (CMA) is one of the most frequent food allergies during infancy with several prenatal and postnatal factors associated to its development.[2] CMA may present as IgE mediated or non-IgE mediated disease, IgE mediated CMA accounts for about 1-2% of infants with food allergy and represents the most severe form of the allergy with immediate and life threatening manifestations.[2]

Vaccines against diphtheria, pertussis and tetanus are routinely given to infants worldwide and these vaccines are included in our national immunizations program alone or with IPV-HiB.[3] It has been demonstrated that these vaccines may include different amounts of residual casein and several cases of anaphylaxis to these vaccines, in children suffering from IgE mediated CMA were reported.[4]

Here we report an infant with CMA who suffered anaphylaxis due to TDaP-IPV-HiB booster dose at 18 months of age. We reviewed the records of a male patient with reported anaphylaxis during routine immunization at 18 months of age.

Case presentation

An 18months old male patient with family history of CMA and inflammatory bowel disease, personal history of non-respondent gastro esophageal reflux disease from birth, chronic bloody diarrhea and failure to thrive within the first year of life. Around 12months of age diagnostic approach demonstrated eosinophil infiltration of the colon mucosa (10 Eo/field 40X) and allergic sensitization to multiple food allergens (cow´s milk protein, egg white, soy, wheat, rice, nuts and carrots) all demonstrated by prick test (weight/volume extracts), prick by prick test and serum specific IgE (2.7 KU/l for Cow´s milk and 0.9KU/l for hen´s egg). The patient improved dramatically with amino acid based formula along with restriction dieting.

He had suffered from 3 events of anaphylaxis on accidentally exposure to cow´s milk and egg white. At 18months of age, he received routine booster TDaP-HiB-IPV vaccine (Pediacel®Sanofi) presenting an immediate reaction (within 5minutes) with hives, angioedema, cough, dyspnea, wheezing and laryngeal edema that improved with intramuscular steroids, antihistamines and inhaled albuterol but not adrenaline in a primary care facility. The patient has been followed at our center with a restricted diet and free of symptoms until now. Appropriate consent was obtained from both parents.

Discussion

Several allergenic vaccine components have been identified: microbial antigens, residues from culture medium, antibiotics, preservatives and stabilizers.[5] Because of the reported residual casein content from culture media for *B. pertussis* in the DPaT vaccine[4] several cases similar to the present have raised concerns about the usage of booster doses of TDaP containing vaccines IgE mediated CMA patients.

Reported patients have history of previous anaphylaxis episodes on accidental exposures to trace amounts of cow´s milk protein and high levels of specific serum IgE.[4] The fact that all patients tolerated first doses before the anaphylactic episode may be explained because in such patients IgE mediated CMA increased during time and is more likely to be a long-term disease.

Different from other reports our patient have low specific cow´s milk IgE levels, but it is known that serum specific IgE levels does not necessarily correlate with the severity of the allergic reaction. As far as we know this is the youngest patient reported with such reactions. The anaphylactic episode was inappropriately treated with antihistamines, albuterol and steroids considering that epinephrine should be used as first line of treatment in such episodes[6] the fact that the patient responded may be explained fortunately because a low grade episode.

Apparently a small group of CMA patients may be at risk of presenting these episodes but as discussed by Slater et al. [7] several bias affect these observations; reports are coming from highly specialized referral centers, allergenic casein derived peptides in the vaccines and their pathogenic role must be better studied in the future in order to draw conclusions or suggestions on prevention or vaccine changes.

Although IgE mediated CMA accounts for a low number of patients, anaphylactic reactions to TDaP vaccines should be considered when

caring patients with severe forms of CMA, especially in pediatric allergy and immunology centers that serve the majority of such patients, where preventive measures or active discussion should be accounted in order to improve their care, our proposals in this regard are:

1. To educate parents and caregivers of these patients about the possibility of a reaction, and to encourage the use of epinephrine as in any other event.
2. When an event was documented, supervised or pre-medicated vaccination should be addressed in later doses. (i.e. vaccination in an allergy center)
3. To develop a worldwide registry of these patients in order to obtain better and wider information to later develop specific guidelines or recommendations.

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Conflicts of interest

The authors declare not having any conflict of interest regarding the present manuscript.

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