CASE REPORT

Cow's Milk Allergy in Preterm Infant with Bronchopulmonary Dysplasia

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Abstract

Cow's milk allergy is frequent in the first year of life. The symptoms may start during the first weeks of life, and may be cutaneous (50-60%), gastrointestinal (50-60%) or respiratory (20-30%), often involving more than one organ system. In this report, we describe a case of cow's milk allergy in a preterm infant in whom rectal bleeding and respiratory symptoms resolved with the introduction of an extensively hydrolyzed formula. Occurrence of the respiratory symptoms of this disorder in a preterm infant with bronchopulmonary dysplasia may cause re-hospitalization after discharge.

KEYWORDS: Preterm infant, milk allergy, bronchopulmonary dysplasia**Received:** 09.01.2014**Accepted:** 08.05.2014**Available Online Date:** 05.11.2014

INTRODUCTION

Cow milk allergy has an incidence of 2-7% in the pediatric age group [1]. Generally, the symptoms appear within the first months of the life [1-4]. The incidences of skin signs such as atopic dermatitis, gastrointestinal symptoms such as blood in the stool, diarrhea and vomiting and respiratory symptoms such as wheezing without the presence of an infection are 50-60%, 50-60% and 20-30%, respectively [5]. Premature infants are exposed to cow milk proteins at earlier periods of the life by consuming formulae and breast milk fortifiers derived from cow milk or via the milk consumed by the mother [6]. In the newborns that develop allergy, it is reported that there is a cell-mediated reaction and that increased number of T-helper-2 cells and decreased number of regulatory T lymphocytes trigger the food sensitivity [2]. In these infants, diagnostic skin tests often fail to give a result for immunoglobulin levels. Therefore, in this age group, cow milk allergy is diagnosed after the resolution of the symptoms upon elimination and the onset of the symptoms when the same antigen is re-encountered [4]. Here, we aimed to present a case of premature infant with severely low birth weight, diagnosed with bronchopulmonary dysplasia (BPD), that we diagnosed with cow milk allergy during the post-discharge follow-up.

CASE PRESENTATION

Newborn with a birth weight of 950 g., who was born at 28th gestational week as the 1st surviving infant from the 1st pregnancy of the 33-year-old mother was hospitalized in the neonatal intensive care unit. Patient was given surfactant therapy for respiratory distress syndrome. As the mother could not bring milk, the newborn was fed using cow milk-based premature formula. During the follow-up, the patient with persistent need for oxygen supply at the age of 28 days was diagnosed with BPD. Patient, who was discharged at 53-day-old, was considered to have moderate BPD due to the administration of oxygen at a concentration of 21-30%. Palivizumab therapy was initiated for the prophylaxis of respiratory syncytial virus (RSV). Parents were instructed to get oxygen condensator, pulse oximeter and oxygen tube to be used at home. One week after the discharge, the infant was re-hospitalized upon the admission to pediatric emergency department with the complaint of respiratory distress and increased need for oxygen. In the examinations, pulmonary radiography (Figure 1) showed that ventilation in the right part was decreased and there were bilateral reticular infiltrations. After ceasing the oral therapy, the patient was initiated on antibiotherapy (cefotaxime) and total parenteral nutrition and, at 3rd day of the treatment, patients with markedly improved clinical presentation were gradually initiated on oral nutrition. In the nasopharyngeal smear, RSV was investigated and adenovirus and parainfluenza serologies were requested. All viral investigations resulted negative. After the completion of the antibiotherapy given for 10 days, the patient was discharged. It was determined that the need for oxygen supply re-occurred and respiratory distress developed in the patient who was presented to the emergency department with the finding of fresh blood in the diaper ten days after the

Figure 1. Bilaterally decreased ventilation, being more marked in the right lung, and the presence of reticular infiltration (first application radiograph)

Figure 2. Decreased ventilation in both lungs and the presence of reticular infiltrations (first control radiograph)

Figure 3. Bilateral lungs are equally ventilated. There are bilateral reticular infiltrations. Compared to previous pulmonary radiographies, the infiltrations are decreased (second control radiograph)

discharge. Pulmonary radiography (Figure 2) showed that bilateral ventilation was decreased and there were reticular infiltrations. For gastrointestinal hemorrhage, prothrombin, partial thromboplastin and bleeding time were investigated

and resulted normal. Physical examination revealed that the abdomen was normal and there was no a problem that could cause bleeding, such as anal fissure. For the patient with normal acute phase reactants in the whole blood count, oral intake was discontinued and antibiotherapy (cefotaxime + clarithromycin) was initiated. In the nasopharyngeal smear, RSV resulted negative. Medical history revealed allergic asthma in the mother. It was thought that rectal bleeding of the patient could be resulting from cow milk allergy. Cow milk-specific immunoglobulin E resulted negative. Patient was initiated to be fed using completely hydrolyzed formula. After the resolution of the clinical findings, the patient was discharged upon the completion of the antibiotherapy to 10 days. In the visit done two weeks later, it was reported that the patient had no distress while taking completely hydrolyzed formula, the need for oxygen supply was decreased and it was taking oxygen supply only when being fed. Pulmonary radiography performed for control (Figure 3) showed that bilateral lungs were equally ventilated and that the infiltrations were decreased compared to previous radiographies. According to the guidelines for the diagnosis of cow milk allergy [4], completely hydrolyzed formula was discontinued and the patient was initiated to be fed using formula appropriate for its age. As the need for oxygen was increased, fresh blood was observed in the stool and occasional vomiting was seen within one week, cow milk allergy of the patient was confirmed. During the follow-up of the patient who was scheduled to be fed using completely hydrolyzed formula, it was seen that the need for oxygen supply disappeared at post-natal 5th month.

The parents were informed about the treatment and the follow-up of the cow milk allergy. Parents gave written consent after being informed that a case report would be prepared and the information and the images of the infant would be used to write the article.

DISCUSSION

In the premature infants, immature intestinal tissue and the problems of the intestinal epithelium (nutritional restriction, ischemic damage, free radicals) increase the intestinal permeability [6]. Therefore, these infants become more sensitive to food allergy [6]. In the study of D'Netto et al. [7] that studies allergic gastroenteropathy in the premature infants, 25 patients diagnosed with allergic gastroenteropathy based on the observation of disseminated eosinophilic infiltration in the intestinal biopsy were evaluated. Majority of these patients were reported to be followed-up with the suspicion of necrotizing enterocolitis (NEC). In this study, it was highlighted that the presence of gastrointestinal symptoms in the premature infants should suggest the likelihood of allergic gastroenteropathy. In our patient, bloody stool was present. However, the fact that our patient was aged 80 days when the bloody stool was detected suggested the cow milk allergy rather than the diagnosis of NEC.

It is known that the patients diagnosed with bronchopulmonary dysplasia more commonly have respiratory problems and more specifically asthma-like problems manifested by wheezing during the follow-up [8]. All respiratory tract infections and more specifically RSV account for re-hospitaliza-

tion of these infants after the discharge. However, it is also reported that, in these infants, the sensitivity to food allergens, especially cow milk, onsets in the early periods after the birth [1-6,9]. In our patient, when all clinical findings were collectively considered, despite the diagnosis of BPD, the concomitance of a respiratory problem related to cow milk allergy. After being switched to the nutrition with completely hydrolyzed formula, our patient was not presented to the hospital for respiratory problems and, moreover, the oxygen supply given was discontinued at the end of 1 month.

Incidence of cow milk allergy was reported as 4-5% in all preterm infants [3]. Incidence of NEC was reported as 10% in the infants with severely low birth weight [10]. In the NEC staging, the presence of suspicion is considered as Stage 1, in which it is recommended to immediately initiate the therapy [10]. In the premature infants, given the severity and the incidence of BPD and NEC, it is normal to be unlikely to diagnose the food allergies at an early period. In our patient, at the first admission after the discharge, respiratory symptoms were attributed to chronic pulmonary disease and eventual pulmonary infection. During the follow-up, at post-natal 80th day, the infant was diagnosed with cow milk allergy.

In the study of Lucas et al. [9], where they investigated 777 preterm infants, it was reported that the presence of an allergy history in the parents was an independent risk factor for asthma and wheezing in the infants with a corrected age of 18 months. Mother of our case had the history of allergic asthma.

Consequently, the cow milk allergy should be considered in the differential diagnosis in the presence of gastrointestinal symptoms such as repeated vomiting, diarrhea and blood in the stool during the follow-up of premature infants. Furthermore, in the premature infants diagnosed with BPD, although the common reason for re-hospitalization after the discharge is lower respiratory infections, it would be useful to also consider underlying non-infectious reasons, such as cow

milk allergy, in the differential diagnosis, as seen in our case.

Informed Consent: Written informed consent was obtained from patients' parents who participated in this case.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - K.Ş.T., İ.C., Y.D.; Design - K.Ş.T.; Supervision - Y.D., İ.C.; Funding - K.Ş.T., İ.C., Y.D.; Literature Review - K.Ş.T.; Writer - K.Ş.T.; Critical Review - İ.C.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

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