

ASSESSMENT OF IGE-MEDIATED AND NON-IGE-MEDIATED COW'S MILK PROTEIN ALLERGY IN CHILDREN

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ABSTRACT

Cow's milk protein allergy (CMPA) is the most common food allergy found in children under 3 years of age. In most cases, it occurs in infancy. Early diagnosis and appropriate treatment can decrease the risk of impaired growth.

In our study, we evaluated 40 children, with ages between 1 month and 3 years, diagnosed with IgE-mediated or non-IgE-mediated CMPA, from January to December 2017, in the Department of Pediatrics of the Clinical Emergency County Hospital of Constanta.

The inclusion criteria consisted of: age, natural or artificial feeding, specific IgE levels, CoMiSS score, and clinical manifestations. The Cow's Milk-related-Symptom-Score (CoMiSS) was developed as a screening and diagnostic tool for CMPA prediction, and can guide pediatricians and primary care physicians to make an early diagnosis, as it can be easily missed.

We observed a higher number of cases of CMPA registered among children who were artificially fed (57,5%), followed by those with mixed nutrition (25%), the remaining (17,5%) being represented by exclusively breastfed infants. The most frequent clinical manifestations were rashes (87,5%), failure to thrive (82,5%), regurgitation (50%) and diarrhea (35%).

Further data should be collected to prove if the association between a CoMiSS score higher than 12 and specific IgE-mediated CMPA is clinically relevant, and can predict, based on clinical examination and anamnesis, high serum levels of specific immunoglobulin E.

The prognosis can depend on the titre of specific IgE at the time of diagnosis, as they are more likely to develop several crossed allergies and less prone to become tolerant to cow milk proteins than those with non-IgE-mediated CMPA.

Keywords: children, cow milk protein allergy.

INTRODUCTION

Food allergies are immunologically mediated side effects that can be determined by any food protein. Depending on the mechanism by which they occur, they are classified into immune-mediated and non-immune-mediated allergies (1).

Cow's milk protein allergy (CMPA) is the most common food allergy found in children under 3 years of age, and results from an immunological reaction to one or more proteins. In most cases, it occurs in the first year of life. The first symptoms can be immediate reactions, occurring from minutes to hours after exposure,

and delayed reactions, which can appear from 48 hours to even a week after the ingestion of cow's milk protein. There are cases where both immediate and delayed reactions can occur (2).

About 10% of patients with IgE-mediated allergy induced by cow's milk proteins, can also develop sensitivity to bovine albumin, which may lead to an increased potential to allergic reactions after beef ingestion (3).

CMPA is characterized by a set of gastrointestinal symptoms such as diarrhea, colic, vomiting, anorexia, regurgitation or even constipation, occult hemorrhages but also by extraintestinal symptoms, such as skin rashes, failure to thrive, inconsolable crying.

It is easier to establish this diagnosis in an infant exclusively fed with powdered milk formula, but things get more complex if the baby is breastfed, being exposed to various food allergens depending on the mother's diet, and in children who have already started a complementary diet. Early diagnosis and appropriate treatment (exclusion diet or formulas with hydrolyzed proteins) can decrease the risk of impaired growth (2).

MATERIAL AND METHOD

We conducted a retrospective study, from January 2017 to December 2017, in the Department of Pediatrics of the Clinical Emergency County Hospital of Constanta, in which we evaluated 40 children, with ages between 1 month and 3 years, diagnosed with IgE-mediated or non-IgE-mediated CMPA.

The inclusion criteria consisted of: age, natural or artificial feeding, specific IgE levels, CoMiSS score, and clinical manifestations.

Given that there are also cases of non-IgE mediated CMPA, all IgE specific values were taken into account, not only the positive levels, the investigation being used more as screening tool, and to help us determine the frequency of non-IgE mediated CMPA.

The Cow's Milk-related-Symptom-Score (CoMiSS) was developed as a screening and diagnostic tool for CMPA related symptoms. This score can be used as an algorithm to predict CMPA and can guide pediatricians and primary care physicians to make an early diagnostic, as it can be easily missed (4).

It evaluates the following symptoms: crying, regurgitation, stools (Bristol scale), skin symptoms and respiratory symptoms. The interpretation of the CoMiSS score is that values higher or equal to 12, supports the diagnosis of CMPA (5).

RESULTS AND DISCUSSIONS

We noticed that most cases of CMPA were registered among girls aged between 1 and 10 months of age – 35 cases (87,5%).

Regarding the distribution of cases,

according to the type of nutrition present, we observed a higher number of cases registered among children who received milk powdered formula - 23 cases (57,5%), followed by those with mixed nutrition - 10 cases (25%), the remaining 7 cases (17,5%) being represented by exclusively breastfed infants.

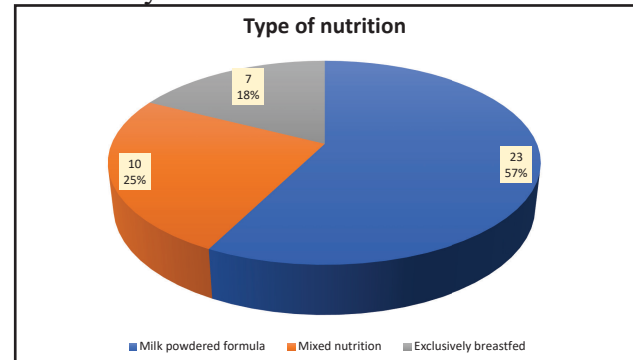


Figure 1 – CMPA prevalence considering type of nutrition

The most frequent clinical manifestations, which led to presentations in the Department of Pediatrics, were rashes - 35 cases (87,5%), failure to thrive - 33 cases (82,5%), regurgitation - 20 cases (50%) and diarrhea - 14 cases (35%).

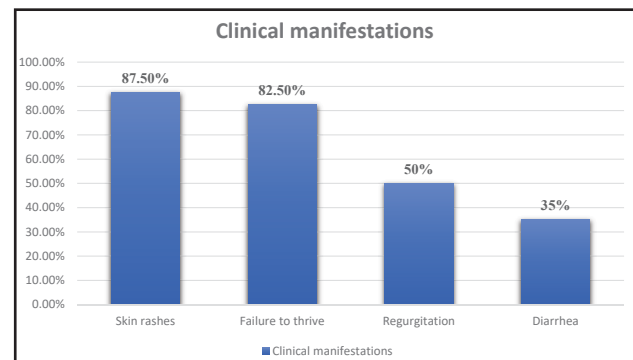


Figure 2 – Prevalence of onset clinical manifestations in children with CMPA

Out of 40 patients studied, 31 of them were diagnosed with IgE-mediated CMPA (77,5%), from which, the majority were girls- 25 cases, and 9 cases (22,5%) were diagnosed with non-IgE-mediated CMPA.

Regarding most of the cases diagnosed with IgE-mediated CMPA, we observed that one of the first clinical manifestations was represented by skin rashes, or, in case of infants with atopic dermatitis, an acute flare, regurgitations, and they all had immediate reactions following cow milk protein ingestion (minutes to several hours) (6).

Considering the cases diagnosed with non-

IgE-mediated CMPA, we noticed that the main reasons for presentations in the Department of Pediatrics consisted of failure to thrive and diarrhea or the presence of mucus in the stools.

The CoMiSS score was assessed in all cases, thus we observed that in 24 cases (60%), the score was higher than 12, all of which were diagnosed with IgE-mediated CMPA, and in 16 cases (40%), diagnosed with non-IgE-mediated CMPA, the score was smaller than 12, with values between 8 and 11.

Further data should be collected to prove if the association between a CoMiSS score higher than 12 and specific IgE-mediated CMPA is clinically relevant, and can predict, based on clinical examination and anamnesis, high serum levels of specific immunoglobulin E (7).

CONCLUSIONS

Cow's milk protein allergy has been diagnosed more frequently in artificially fed infants.

Failure to thrive has been frequently observed in children with CMPA, making it that more important to diagnose and manage, in order to decrease the risk of impaired growth, as once children reach 2 years of age, it is more improbable to regress stunting.

The prognosis can depend on the titre of specific IgE at the time of diagnosis, the higher the value, the more they are likely to develop several crossed allergies, are at a higher risk of developing other IgE-mediated diseases in the long run, and less prone to become tolerant to cow milk proteins than those with non-IgE-mediated CMPA.

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