

## COW'S MILK PROTEIN ALLERGY IN INFANTS

Dubău Diana

University of Oradea, Faculty of Medicine and Pharmacy, Piața 1 Decembrie, Nr.10, Oradea, România, e-mail: [dubaudiana@yahoo.com](mailto:dubaudiana@yahoo.com)

### **Abstract**

**Introduction.** Cow's milk protein allergy represents an important health issue, being the most frequent allergy in infants. It is characterized by an immunological reaction to one or more milk proteins, responsible of immediate or late onset symptoms. The purpose of the study was to analyze the clinical, demographic and evolutionary aspects of the cow's milk protein allergy in infants.

**Material and method.** We performed an retrospective study including a sample of 43 infants with 0-1 year of age hospitalised in Pediatric Clinic from Oradea during 2012-2016 and diagnosed with cow's milk protein allergy. It was performed a detailed anamnesis and a rigorous clinical examination, investigation including an elimination diet and challenge test. The evolution of the patients was followed in dynamics.

**Results.** An approximately equal sex distribution was detected: 22 female and 21 male, a slightly increased incidents in urban than rural areas: 54%. Most of the cases had 1-3 months: 22 (52%). 9: 0-1 months, 11: 3-6 months, 1: 6-12 months. The birth weight was normal in 74%, 26% had less than 2500gr.

Majority of the subjects 86% had been breast feed less than 3 months. Most frequent the symptoms appeared between 3-10 days after introducing the cow's milk protein (56%). Family history of allergy was detected at 53% from cases.

Digestive symptoms were present at 27 infants (63%). Diarrhea in 25 cases, vomitings and regurgitations in 17, abdominal colics 15, constipation in 2 patients. Extradigestive symptoms were detected in 16 cases (37%). 14 subjects had skin manifestation and angioneurotic edema. 2 infants presented respiratory symptoms.

Mixed symptomatology revealed 7 cases (16%). Growth deficit was present in 10 situations (24%). **Conclusions.** The analysis of clinical and evolutionary aspects of this pathology provides a superior therapeutic attitude and ensures a normal development.

**Key words:** allergy, infants

### **INTRODUCTION**

Cow's milk protein allergy is a complex disorder characterized by an immunological reaction to one or more milk proteins, responsible of immediate or late onset symptoms. Most frequent is produced by betalactoglobulin.

The other allergic components that can be incriminated are alfa lactalbumin, lactoferin and less often casein. It is the most frequent allergy in infants and small children, therefore is it an important issue for their health. The most recent studies reveal an increasing of incidents from 1,9% to 4,9%. In 82% from the children symptoms appeared in the first 4

months of age and in 89% to 1 year of age. The majority of the affected infants have one or more symptoms involving one or more organ systems, mainly the gastrointestinal tract, skin, respiratory tract. Cow's milk protein allergy is unlikely unless it is associated with a family risk factor.

The purpose of the study was to analyse the clinical demographic and evolutionary aspects of cow's milk protein allergy in infants.

## MATERIAL AND METHOD

We performed an retrospective study including a sample of 43 infants with ages between 0-1 year, hospitalised in Pediatric Clinic from Oradea during 5 years: 2012-2016 and diagnosed with cow's milk protein allergy. It was performed a detailed anamnesis, a rigorous clinical examination in all the cases. Also there were performed laboratory investigations including total IgE and specific IgE.

The most important was the therapeutic test involving elimination diet and subsequent double-blind, placebo-controlled food challenge. The evolution of the patients was followed in dynamics by clinical and laboratory controls. Therapy consisted in elimination of cow milk protein from the diet. Breast-feeding mothers eliminated all dairy products from their diets. Formulas were replaced by hypoallergenic formulas based on extensively hydrolysed proteins. In one case, older than 6 months, a soy-protein formula was efficient.

## RESULTS AND DISCUSSION

In the interval between 01 Jan. 2012 – 31 Dec. 2016 were diagnosed and treated 43 infants with 0-1 year of age in Pediatric Clinic from Oradea. The study revealed an approximately equal sex distribution: 22 female and 21 male. This is in line with studies from the literature, however, there are studies which highlight a predominance in males. Depending on the environment a slightly increased incidence: 54% in urban than in rural areas: 46% was noticed, in concordance with the majority of the analysis. The age of the subjects was: 9 newborns 0-1 month, most frequent 22 (52%) were 1-3 months old, 11 infants were 3-6 months, 1 patient was 6-12 months (Fig. 1). The predominance in the first 3 months is in accord with the literature which reveals an incidence of 80% at this age.

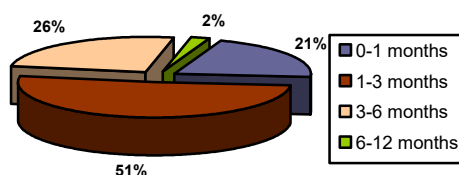


Fig. 1. Distribution on age

The birth weight of the infants from our analyse was normal in 32 cases (74%), 11 cases had less than 2500 gr. at birth. In other studies the prevalence of this pathology is higher in situations with birth weight less than 2500 gr. Majority of our casuistry: 37 infants (86%) have been breast-fed less than 3 months.

In 6 situations breast-feeding has been longer than 3 months. One of the patients was exclusively breast-fed but the allergy appeared because of an increased amount of cow milk in the mother's diet. All the data in the literature confirms insufficient natural feeding as a factor favouring this pathology.

The interval between introducing the cow's milk protein and the onset of the symptoms was less than 3 days in 3 patients, most frequent: 24 cases (56%) the onset was noticed between 3-10 days. The symptoms appeared later than 10 days in 15 situations.

Family history of allergy was detected in 53% from the patients. The data from the studies confirm that association of the cow's milk protein allergy in infants with the family history of atopy.

The risk of allergy is variable: 1 parent with allergy – 20-40%, one sibling with allergy – 25-30%, both parents with allergy – 40-60%. If both parents have the same type of allergic manifestation the risk is 60-80%.

The most frequent symptoms were digestive, in concordance with the literature.

There were noticed in 27 patients (63%). Diarrhea presented 25 infants, in many cases the stools contained fresh blood. Vomiting and regurgitations revealed 17 subjects, abdominal colics 15 situations. In 2 cases chronic constipation was present. Chronic constipation and gastro-esophageal reflux had been accepted recent as possible manifestation of cow's milk protein allergy. Extradigestive symptoms were noticed in 16 infants (37%). In 14 cases were skin manifestation: atopic eczema, urticaria, rush, angioneurotic edema. Two patients presented respiratory symptoms – recurrent wheezing. In 7 situations (16%) from casuistry mixed symptomatology: digestive and extradigestive was present. (Fig. 2)

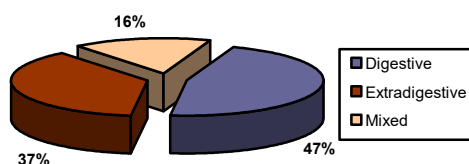


Fig. 2. Symptoms in cow's milk protein allergy

The literature data reveals a predominance of digestive symptomatology, especially in infants less than 3 months of age. In an international study it had been proved that 6% from children with cow's milk protein allergy had constipation resistant to treatment.

Growth deficit was present in 10 patients (24%).

Associated pathology was noticed in 3 cases: 1 subject with congenital hypothyroidism, 1 infant with hereditary spherocytosis, other with Down syndrome.

The annual distribution revealed a peak in 2013: 17 cases, while the distribution was relatively constant: 7 cases in 2012, 8 in 2014, 6 in 2015, 5 in 2016.

The treatment was mainly dietetic, consisting in the exclusion of cow milk and its derivatives, and replacing with hypoallergenic formulas based on extensively hydrolysed proteins.

In one case, older than 6 months, soy-protein formula was introduced with favourable evolution.

The North American Society for Pediatric Gastroenterology, Hepatology and Nutrition and ESPGAN recommendations agree that soy formulas should not be used in infants with food allergy under 6 months of age.

Use of extensively hydrolysed protein formulas rather than soy-formulas is recommended in infants with IgE-mediated cow's milk protein allergy.

The evolution was favourable in all of the patients with remission of symptoms after setting-up the diet.

## CONCLUSIONS

1. Cow's milk protein allergy was more common in infants less than 3 months of age
2. Insufficient breast-feeding has been an important contributing factor
3. Family history of atopy was noted in more than 50% of patients.
4. Digestive symptoms were predominant

## REFERENCES

1. Ciofu C, Ciofu E, Esentialul in Pediatrie, 2017, Bucuresti, pp. 392-400
2. Grigorescu Sido P., Tratat elementar de pediatrie, vol. III, 1997, Cluj-Napoca, pp. 140-185
3. Kleinman R.E., Goulet O.J., Mieli Vergani S., Sanderson J.R., Sherman P.M., Schneider B.L. (eds), Walker's Pediatric Gastrointestinal Disease vol. I, People's Medical Publishing House – USA, Shelton C.T., 2008, pp. 117-206
4. Kliegman R.M., Stanton B.F., Schor N.F., St. Geme III, J.W., Behram R.E. (eds), Nelson Textbook of Pediatrics, Elsevier Saunders, Philadelphia, 2011, pp. 1274-1280, 1290-1294
5. McInerney T.K., Adam H.M., Campbell D.E., Kamat D.M., Kelleher K.J. (eds). American Academy of Pediatrics Textbook of Pediatric Care, Elk Grove Village I.L., American Academy of Pediatrics, 2009, pp. 1376-1384, 1543-1550.
6. Muraro A., Dreborg S., Halken S., et al: Dietary prevention of allergic diseases in infants and small children. Part III: Clinical review published peer-reviewed observational and interventional studies and final recommendations. *Pediatr Allergy Immunol* 2004; 15: pp. 291-307
7. Nan S., Nanulescu M., *Pediatrie Practică*, 2006, Cluj-Napoca, pp. 494-511
8. Sampson H.A., Update on food allergy. *J. Allergy Clin Immunol* 2004, 113: pp. 805-819
9. Sampson H.A., Anderson J.A. Summary and recommendations: Classification of gastrointestinal manifestations due to immunologic reactions to foods in infants and young children. *J. Pediatr. Gastroenterl. Nutr.* 2000; 30: pp. 587-594

