

- b) If there is suspicion of eyeball or eyelid laceration, a plastic shell (or paper cup secured with tape) should be placed to prevent rubbing.
- c) Immediate referral to a specialized facility.

CONCLUSION

The age at which the trauma incidence was higher was the 6-11-year-old age group; male gender was most commonly affected; and most patients suffered blunt force trauma. In this series, 15 patients who underwent traumatic cataract surgery and completed 1 year of follow-up achieved a 20/70 or better VA. ■

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Prevalence of cow's milk protein allergy among children in a university community hospital

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ABSTRACT

Cow's milk protein allergy (CMPA) is the most common food allergy in pediatrics. In Argentina, the prevalence of this disease has been evaluated in a few trials.

Objectives. To estimate the prevalence of CMPA and describe its variation throughout a period of 11 years.

Population and methods. A retrospective cohort study was carried out in live newborn infants enrolled in a health care program of a university community hospital.

Results. One hundred and sixteen cases of children with CMPA were identified. Cumulative prevalence was 0.8% (95% confidence interval [CI]: 0.65-0.95). A percent increase of 0.4% in 2004 to 1.2% in 2014 was observed in the number of cases per year. **Conclusion.** In 2014, CMPA prevalence was 1.2%, i.e. three times that of 2004.

Key words: food allergy, cow milk, child, prevalence.

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INTRODUCTION

Cow's milk protein allergy (CMPA) is the most common food allergy in pediatrics, with a prevalence ranging between 1.8% and 7.5% in the first year of life.¹

It is defined as a reproducible adverse immune reaction induced by cow's milk protein. It may be classified into three categories: a) immunoglobulin E (IgE)-mediated, with an immediate onset of symptoms after the intake; b) non-IgE-mediated, with a late onset of symptoms, or c) with mixed symptoms.^{1,2}

Besides, due to the food allergy symptoms perceived and reported by patients, this illness has been diagnosed up to 10 times in excess.³ This situation may lead to avoidant eating behaviors, unbalanced diets and an impact on the patients and their families' quality of life.^{4,5}

The prevalence of food allergy may vary among different contexts according to cultural characteristics, the preparation, and the local factors affecting the exposure to this type of food.²

In Argentina, the prevalence of food allergy has been evaluated in a few trials.⁶ This information is relevant in order to improve education, preventive strategies and the design of policies about eating.

OBJECTIVE

To estimate the prevalence of CMPA among children in a university community hospital from 2004 to 2014, and to describe its variation throughout that period of time.

PATIENTS AND METHODS

A retrospective, cohort study was carried out from January 1st, 2004 to December 31st, 2014.

The population was made up of all live newborn infants in Hospital Italiano de Buenos Aires (HIBA), and the sample consisted of all the live newborn infants who were enrolled in Hospital Italiano's Medical Program (PMHI).

The PMHI is a health organization which provides medical services to more than 150 000 people. It comprises two main hospitals and 24 centers featuring medical offices, and it delivers an average of 95 births per month in the Autonomous City of Buenos Aires and Greater Buenos Aires.

Electronic medical records of all births occurred during the study period were reviewed. The different cases were identified through the following media: a) databases of the Division of Allergy and the Department of Pediatric Gastroenterology, and b) electronic register of patients with International Classification of Primary Care (ICPC) code, and code T 78.1 of the International Disease Classification 10 (IDC 10).

Each medical record with a potential CMPA diagnosis was confirmed by allergy and gastroenterology experts in accordance with the World Allergy Organization guidelines for the Diagnosis and Rationale for Action against Cow's Milk Allergy (DRACMA).³

CMPA diagnosis was confirmed if the child met at least one of the following criteria:²

1. Patients with symptoms of immediate hypersensitivity and positive specific IgE confirmation through an immediate-reading skin test or an enzyme-linked immunosorbent assay (ELISA) with positive result for cow's milk proteins, or positive food challenge test in those cases where there was clinical suspicion but negative test results.
2. Patients with late symptoms and negative specific IgE, improvement secondary to diet, and return of symptoms after open food challenge.

The following outcome measures were defined: sex; type of delivery (vaginal, C-section); age at the time of diagnosis; baseline symptoms: a) non-specific gastrointestinal symptoms, such as diarrhea, nausea, vomiting, abdominal cramps or bloody stools (non-IgE-mediated, appearing one hour to several days after exposure), b) urticaria, rhinitis, bronchospasm, anaphylaxis (IgE-mediated, appearing within an hour of exposure), and c) atopic dermatitis (mixed mechanism); feeding type at the onset of symptoms: exclusive breastfeeding, introduction of modified milk, introduction of dairy products.

The study was approved by the Research Protocol Evaluation Committee of HIBA. The prevalence of CMPA among children was calculated as the detected number of children with CMPA divided by the number of annual births. Categorical outcome measures were described as percentages, and continuous outcome measures were expressed as mean and standard deviation (SD). The STATA 12, USA, statistical software was used.

RESULTS

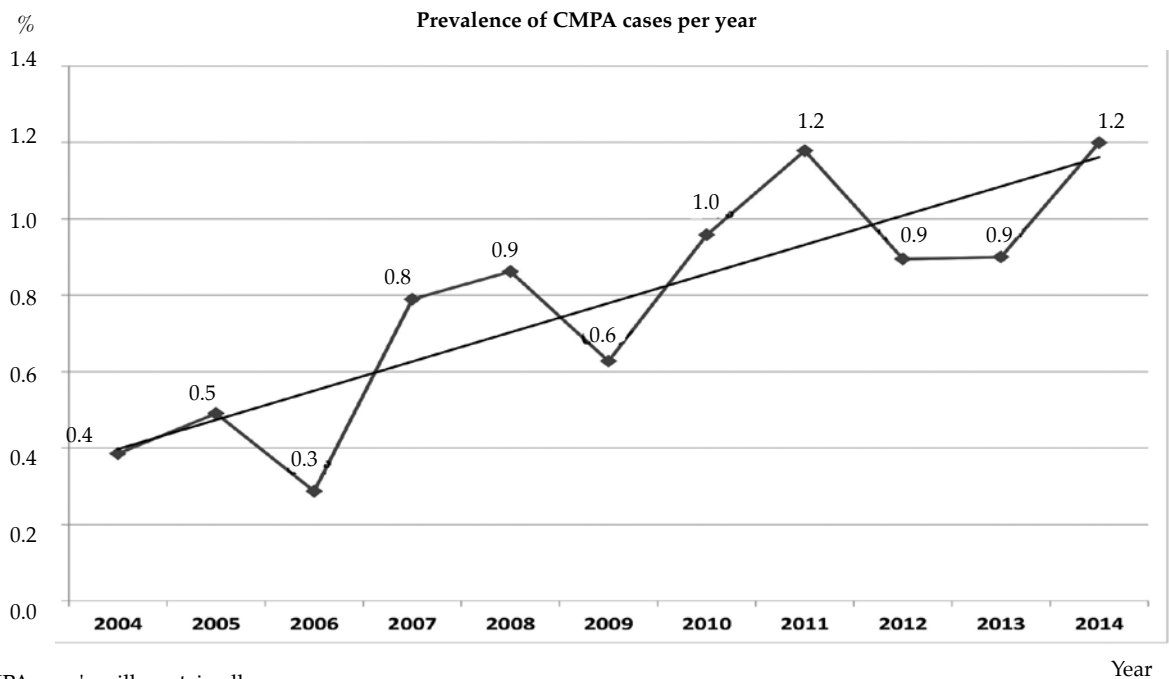
Between January 2004 and December 2014, 14 710 births were recorded and 116 cases of children with CMPA diagnosed at birth or within their first year of life were identified. The prevalence during the study period was 0.8% (95% confidence interval [CI]: 0.65-0.95). The diagnosis of CMPA increased with time: from

0.4% in 2004 to 1.2% in 2014 (Figure 1).

Patients with CMPA showed the following clinical characteristics: 55.2% were girls, average age at diagnosis was 3.6 months (standard deviation [SD] of 2.1; range: 1-11 months). Children born through C-section accounted for 55.8% of cases (Table 1).

The most frequent symptoms at baseline

FIGURE 1. Prevalence of cow's milk protein allergy between 2007 and 2014



CMPA: cow's milk protein allergy.

TABLE 1. Clinical characteristics of children with cow's milk protein allergy

		N = 116
* Sex	Male	52 (44.8)
	Female	64 (55.2)
** Age in months		3.6 (2.1)
* Baseline symptoms	Bloody stools	48 (41.4)
	Non-specific gastrointestinal symptoms	20 (17.2)
	IgE-mediated symptoms	32 (27.6)
	Mixed symptoms	16 (13.8)
* Feeding type at the onset of symptoms	Exclusive breastfeeding	18 (15.6)
	Introduction of modified milk	79 (68.7)
	Introduction of dairy products	18 (15.6)
* Type of delivery	Vaginal delivery	50 (44.2)
	C-section	63 (55.8)

* Number of cases and percentage.

** Mean and standard deviation.

were bloody stools (41.4%), and IgE-mediated symptoms represented 27.6%. In 68.7% of the cases, symptoms started when modified milk was introduced (Table 1).

DISCUSSION

CMPA prevalence was of 1.2% in 2014, with an increase of 0.4% to 1.2% along the 11 years of the study, which was consistent with that mentioned in international reports.⁷⁻⁹

CMPA usually develops during the first year of life, mainly because cow milk is frequently the first food protein to which children are exposed.¹⁰ Accordingly, our study describes average age at diagnosis is 3.6 months, and in most cases (68.7%) it coincides with the introduction of modified milk to the infant's diet.

A meta-analysis of European studies¹¹ revealed that most published studies were based on self-reported data; only few studies were able to confirm suspicious cases by means of a complete clinical assessment and oral challenges.

The prevalence of CMPA is affected by genetic and environmental differences, and might vary in different geographic areas.² Yet, the prevalence result in our study was similar to that of other European studies. Eggesbo et al. studied a population of 2.5 year-old Norwegian children, and found a prevalence of 1.2% in 2001. Most of these patients showed non-IgE-mediated mechanisms.⁷ Venter et al. obtained identical results in a population of 2 year-old English children assessed by means of skin tests and food challenge tests.⁸ The same occurred in a French study published by Rance et al., who described a prevalence of 1.1% of CMPA within a population of children between 2 and 14 years old in 2005.⁹ The results are similar, and the populations present different genetic and environmental characteristics, but these studies are not comparable due to a significant heterogeneity emerging from the different methodological and diagnostic criteria applied.

By means of a meta-regression (statistical method used in meta-analysis) of 20 surveys performed between 1988 and 2011 on a population of 400 000 children in the United States, an increase of 1.2% per decade was estimated in the general prevalence of food allergies.¹² Another fact that can be used to estimate the increase of this prevalence is the growing number of hospitalizations due to anaphylaxis caused by food.¹³ Prevalence was found to have tripled along the 11 years of our study.

This increase in prevalence cannot be explained by the genetic diversity; therefore, it might be the result of environmental factors associated to modern lifestyle. Among the investigated factors, we can mention the diversity of bacterial flora, infants' feeding factors and hypovitaminosis D.¹⁴

The most frequent symptom at baseline was bloody stools (41.4%); 58.6% of the patients developed non-IgE-mediated symptoms, as informed in other reports.⁹

A limitation of our study was its retrospective design, although the diagnosis process was performed by the same team of experts, and having an electronic record allowed us to minimize under-recording. Also, this population had access to health care through a private health insurance, so our sample was not representative of the total Argentine population.

Despite the limitations mentioned, this study contributes new and valuable information which should be supplemented by future investigations.

CONCLUSION

CMPA prevalence was 1.2% in 2014, with an increase of 0.4% to 1.2% observed along the period studied. ■

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