

## Clinical Features and Specific IgE in Babies and Children with Cow's Milk Allergy

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**ABSTRACT** A descriptive prospective study was done on babies & children not older than 3 years of age who came to Pediatric Allergy & Immunology Clinic, Medical School, University of Indonesia - Cipto Mangunkusumo Hospital, Jakarta, during the period of April 1996-March 1997. Screening test included interview, physical examination elimination and open provocation. The aim of the study was to determine clinical features and specific IgE of babies and children with cow's milk allergy (CMA). Among 541 patients, 18 were diagnosed as CMA. The most common clinical symptoms was chronic and recurrent cough (CFC), while only 5 patients were suffering from diarrhea. Specific IgE examination gave positive results on 7 patients, skin tests were positive in 11 patients, and increased total IgE count were found in 13 patients. All CMA patients had family history of atopics. [*Paediatr Indones* 1999; 39: 83-87].

### Introduction

Cow's milk allergy (CMA) is an immunological reaction which arises as a result of cow's milk or food contained with cow's milk's allergen consumption.<sup>1</sup> CMA in babies and children remains a problem since the mechanism is still unclear and there are many controversies on studies results.<sup>2</sup> The prevalence of CMA in babies and children varied in many countries due to differences of clinical findings and diagnostic criteria. In the USA, CMA prevalence ranged from 0.3-7.5%.<sup>3</sup> Another study in Jakarta in 1991 showed a prevalence of 2.4%.<sup>2</sup> CMA pathogenesis includes immunologic and non immunologic mechanisms. Non immunologic mechanism, among others, influenced by hereditary factor, intrauterine sensitization, intestinal permeability, cow's milk protein,

breast milk and infection.<sup>2,5-7</sup> Immunologic mechanism may involve types I, III, IV reactions (Gell and Coombs Classification).<sup>8</sup> Immediate reaction (type I), which involves IgE, is the most commonly found allergic reaction.<sup>8,9</sup>

CMA clinical manifestations may be found in any organ, but gastrointestinal tract, respiratory tract and the skin are the most common ones.<sup>2,3,8</sup> The most frequent clinical symptoms are diarrhea, vomiting, abdominal pain, atopic dermatitis, rhinitis, recurrent coughing and urticaria.<sup>10</sup> Most CMA symptoms appear during the first year of life and 27-95% of them disappear by the age of 3 years.<sup>5</sup> The diagnosis of CMA is established based on thorough interview, clinical symptoms observation, elimination and double blind placebo control food challenge (DBPCFC) provocation.<sup>3</sup> No immunologic supporting examination give satisfactory result so far. Cow's milk specific IgE examination in this study was expected to support the establishment of CMA diagnosis. The aim of this study was to get a clinical and specific IgE views in babies and children with CMA.

### Methods

The study design is descriptive. Subjects were all patients not older than 3 years of age who came to the Pediatric Allergy & Immunology Clinic, Medical School - Cipto Mangunkusumo Hospital, Jakarta during the period of April 1996-March 1997, and passed the screening tests which included interview, physical examination, elimination, and provocation. Laboratory tests were done, including hematological tests, i.e. total eosinophil and IgE counts. Provocation test done in this study was an open provocation test. Elimination was done by soy milk consumption (Prosobee for babies <6 months, and Sobee plus for the others). Both elimination and provocation were done 3 times to each patient. Following the establishment of CMA, cow's milk protein skin test and cow's milk specific IgE test were done.

### Results

During of the period of April 1996-March 1997, CMA screening was done to 541 babies and children less than 3 years of age who attended the Pediatric Allergy & Immunology Clinic, Department of Child Health, Medical School, University of Indonesia, Cipto Mangunkusumo Hospital. In this study 18 patients were diagnosed as CMA, ranging in age from 0-3 years, 13 of them were below 1 year old, 3 cases were between 1-2 year, and 2 cases were older than 2 year.

Most cases (14 out of 18) presented their first symptoms before the age of 1 year. The earliest symptom appeared at first day of life and the latest appeared at the age of 19 months. A total of 17 CMA patients were breast-fed, most of them had it for 4-12

months, 2 patients had it for more than 12 months, and 4 patients had it for less than 4 months.

Most of the patients (15 out of 18) started to receive cow's milk formula before the age of 6 months. All patients had a family history of atopy. The most commonly found clinical symptom was chronic and recurrent cough (13), the others were diarrhea (5), atopic dermatitis (4), urticaria (1), and allergic rhinitis (2). Increased total IgE value were found in 13 patients and increased total eosinophil value were found in 12 patients. The other patients had normal values.

On skin tests, 11 patients showed positive reaction to cow's milk. Cow's milk specific IgE was positive in 7 patients. The distribution of skin test results with total IgE and specific IgE is shown in Table I.

Table 1. Distribution of skin test to total IgE and specific IgE

No	Skin test	Total IgE	Spesifik IgE
1.	+	N	-
2.	-	↑	-
3.	-	N	-
4.	+	N	+
5.	-	↑	+
6.	-	↑	-
7.	-	N	-
8.	+	↑	-
9.	-	↑	-
10.	+	↑	+
11.	+	↑	+
12.	+	↑	-
13.	+	↑	-
14.	+	↑	+
15.	-	↑	-
16.	+	↑	+
17.	+	↑	+
18.	+	N	-

### Discussion

The diagnosis of CMA in this study was established based on interview, physical examination, elimination and provocation. Supporting examinations included total IgE count, eosinophil count, cow's milk specific IgE and skin test.

In this study, the number of male and female patients was equal. Some studies

found that male patients were twice as much as female.<sup>11</sup> Most patients showed their first CMA symptoms before the age of 6 months. This condition was possibly caused by early consumption of cow's milk formula and supplementary food; our series showed that most patients started to receive cow's milk formula before the age of 6 months. A study in the USA shows that the most frequent age of first symptoms is during the first 6 months of life.<sup>12</sup> In this study, data of first symptoms were not completely collected because they were collected only through interviews.

Almost all of the patients in this study (17 out of 18) were breast-fed. Some researchers state that there are no correlation between the duration of breastfeeding and the age of first atopic symptoms in babies & children.<sup>13,14</sup> In CMA, human milk is presumed to play a protective role, since it has secretory IgE which is able to cover the gastrointestinal mucous layer in babies so that antigens could be neutralized.<sup>5</sup>

It seems that there are still controversies on human milk's protective effect to allergy incidence or its influence to the age of first atopic symptoms. In this study we realize the lack of separating patients who received breast-feeding exclusively and those who also received other food. Without concerning its effect to CMA, breastfeeding is strongly suggested for babies since it is the best for them.

This study also showed that all patients had a family history of atopy. This is consistent with the results of studies of genetic roles in atopic diseases.<sup>2,5</sup> Clinical features may give more than one symptom in some patients. The most commonly found symptom is chronic and recurrent cough which was found in 13 patients. Diarrhea was found only in 5 patients. This condition doesn't consistent with the literature that diarrhea is the most common symptom in CMA.<sup>10</sup> This may be a result of the fact that patients with diarrhea are usually come to the Pediatric Gastroenterology Clinic. So further study should be done in cooperation with the Division of Gastroenterology.

Increased total IgE and eosinophil values was found in most patients. This condition supported the diagnosis of allergy, while normal values did not exclude type I reaction.<sup>5</sup> Among 18 patients, only 11 showed positive result on cow's milk skin test. This result was possible because in children under 1 year of age skin test commonly give negative result due to lack of mast cells.<sup>4</sup> Seven patients had positive cow's milk specific IgE. In this study, the allergic reaction could not be identified as intermediate, slow or rapid reaction. Cow's milk specific IgE examination was expected to be positive in all patients but on the contrary it was not. The possibility that not all of the allergic reaction is an IgE mediated type, may be the answer of that result.

We conclude that the most commonly found CMA clinical symptom is chronic and recurrent cough, followed by diarrhea, atopic dermatitis, allergic rhinitis and urticaria. Cow's milk specific IgE is found in 7 (out of 18) patients who showed type I allergic reaction. So far provocation test and elimination are still the gold standards for establishing the diagnosis of CMA.

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