

Factors Affecting the Severity of Cow's Milk Anaphylaxis

Pegah Teymourpour¹, Raheleh Shokouhi¹, Mohammad Reza Fazlollahi¹,
Masoud Movahedi^{1,2}, Mahboobeh Mansouri³, Bahram Mirsaeedghazi⁴,
Anoshirvan Kazemnejad⁵, Seyedeh Kimia Yavari¹, Zahra Pourpak¹, and Mostafa Moin^{1,2}

¹ Immunology, Asthma and Allergy Research Institute, Tehran University of Medical Sciences, Tehran, Iran

² Department of Immunology and Allergy, Children's Medical Center, Tehran University of Medical Sciences, Tehran, Iran

³ Pediatric Infections Research Center (PIRC), Mofid Children's Hospital, Shaheed Beheshti University of Sciences, Tehran, Iran

⁴ Department of Pediatric, Bahrami Hospital, Tehran University of Medical Sciences, Tehran, Iran

⁵ Department of Biostatistics, Tarbiat Modares University, Tehran, Iran

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There is a wide range of food allergy manifestations ranging from mild local to severe systemic reactions called anaphylaxis. Anaphylaxis is an IgE-mediated hypersensitivity manifestation which happens so rapid and can cause death.¹ Although there are different triggers for anaphylaxis but foods are the most common in children, adolescents and young adults.^{2, 3} It was reported that 30% of fatal anaphylaxis were due to foods.⁴ Cow's milk as the leading cause of food induced anaphylaxis in Iranian children has a great importance.⁵ Since food induced anaphylaxis can potentially threaten patient's life, determining the factors affecting the severity of cow's milk anaphylaxis is very important. Children (<18 years old) who had experienced cow's milk anaphylaxis and had been referred to Immunology, Asthma and Allergy Research Institute (IAARI) during 2005 to 2010 were considered in this study. Following fulfilling a detailed questionnaire by a physician, total IgE and cow's milk-specific IgE using Immucap were measured. Severity was assessed by a 5-grade anaphylaxis severity

system.^{6, 7} The relationship between the severity and demographic features (age, sex, age at the time of first attack), clinical features of anaphylaxis (cutaneous, respiratory, gastrointestinal, cardiovascular and neurologic symptoms), laboratory findings (total IgE level, cow's milk specific IgE), frequency of anaphylactic attacks, patients' and their families prior history of atopy, parents' educational level and the period between allergen (cow's milk) contact and the onset of anaphylactic symptoms were assessed and analyzed using the Correlation-Coefficient or mann-Whitney Tests ($p < 0.05$).

Among 49 patients, 59.2% were male. The mean age of patients was 5 years old and their mean age at the time of first attack was 5.7 months (SD=±4.3 months). Most patients (79.5%) experienced more than one episode of anaphylaxis and the first attack occurred during the first year of life in 85.7% of cases. Also majority of cases (85.7%) showed reactions within 15 minutes after allergen contact (cow's milk and dairy foods). Thirty-five patients had been previously prescribed adrenaline auto injector device but only two had carried it with themselves, the rest had not purchased it or had forgotten to take it. Almost half of the patients had prior history of atopic diseases and 59.2% had positive family history of atopy. Most patients' parents

Corresponding Author: Zahra Pourpak, MD; PhD;
Immunology, Asthma and Allergy Research Institute, Tehran
University of Medical Sciences Tehran, Iran. P.O. Box: 14185-863,
Tel: (+98 21) 6693 5855, Fax: (+98 21) 6642 8995, E-mail:
pourpakz@sina.tums.ac.ir

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did not have university degrees, 69.4% of mothers and 63.3% of fathers had low educational level. Severity grading showed that 2%, 4.1%, 6.1%, 18.4%, 69.4% and of patients experienced anaphylaxis in grades 1 to 5, respectively. There was no mortality report among our patients during this study. The most common manifestations of cow's milk anaphylaxis were cutaneous (98%), respiratory (91.8%), gastrointestinal (55.1%), cardiovascular (46.9%) and neurologic (46.9%) symptoms, respectively. Mean total IgE level was 239.6 ± 3.3 (KU/L) and mean cow's milk-specific IgE level was 19.28 ± 27.2 (KU/L).⁷ Direct relationship between severity and the number of anaphylactic attacks as well as existence of respiratory, cardiovascular and neurologic symptoms was found. There was a negative relationship between the severity of anaphylaxis and educational level of patients' mothers (Table 1).

Table 1. Risk factors predicting severe cow's milk anaphylaxis attack.

Direct risk factor	P. value
Number of anaphylactic attacks	0.009
Respiratory signs and symptoms	0.036
Cardiovascular signs and symptoms	0.003
Neurologic signs and symptoms	0.003
Mothers' educational attainment	0.038

These results address the patients with cow's milk anaphylaxis, their families and all health care providers. Factors such as presentation of anaphylaxis with respiratory, cardiovascular and neurologic symptoms and parents' low educational levels could be an alarm for health care providers to pay more attention

to the patients with these risk factors. These patients should be observed regularly and their families should be informed on primary management of anaphylaxis.

Since increasing in the frequency of anaphylactic attacks is a risk factor for severe anaphylaxis, educational programs are necessary for the patients with cow's milk anaphylaxis and their care givers. To better protect these patients, giving information about avoidance of causative allergen is necessary.

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