

#667 Recurrence rates of anaphylaxis in children.

Andrew O'Keefe, MD^{a,b}, Yvan St. Pierre, MSc^c, Jennifer Mill^a, Christopher Mill, BSc^d, Alizee Dery^a, Yuka Asai, MD, MSc^{e,j}, Harley Eisman, MD^c, Sebastien La Vieille, MD^f, Reza Alizadehfar, MD^a, Lawrence Joseph, PhD^{c,g}, Judy Morris, MD^h, Ann Clarke, MD, MScⁱ, Moshe Ben-Shoshan, MD, MSc^a

- a. Division of Pediatric Allergy and Clinical Immunology, Department of Pediatrics, McGill University Health Centre, Montreal, Quebec, Canada
b. Discipline of Pediatrics, Faculty of Medicine, Memorial University, St. John's, Newfoundland & Labrador, Canada
c. Division of Clinical Epidemiology, Department of Medicine, McGill University Health Centre
d. School of Population and Public Health, Faculty of Medicine, University of British Columbia, Vancouver, British Columbia, Canada
e. Montreal Children's Hospital, Emergency Department, McGill University Health Centre
f. Food Directorate, Health Canada, Ottawa, Ontario, Canada
g. Departments of Epidemiology and Biostatistics, McGill University, Montreal, Quebec, Canada
h. Sacre-Coeur Hospital, Montreal, Quebec, Canada
i. Division of Rheumatology, Department of Medicine, University of Calgary, Calgary, Alberta, Canada
j. Division of Dermatology, Department of Medicine, Queen's University, Kingston, Ontario, Canada



Abstract

Rationale: Determine recurrence rate of anaphylaxis in children.

Methods: As part of the Cross-Canada Anaphylaxis REgistry (C-CARE), parents of children identified prospectively at the Montreal Children's Hospital Emergency Department and Sacre-Coeur Hospital with anaphylaxis were contacted annually after presentation and queried on subsequent allergic reactions. Cox regression analysis was conducted to determine factors associated with recurrence.

Results: Among 266 children presenting with anaphylaxis, 96 completed follow-up questionnaires (36.1%). Respondents were younger (median age 3.6 vs. 6.5 years) and more likely to have had severe anaphylaxis at baseline (10.4% vs. 2.9%) than non-respondents. Respondents reported 42 episodes of anaphylaxis in 25 patients, with an annual incidence of recurrent anaphylaxis of 28.8%. Those with recurrent anaphylaxis had a median age of 4.2 years and most were males (56%). Children with recurrent anaphylaxis were less likely to have peanut as a trigger for anaphylaxis (hazard ratio 0.29, 95% CI 0.11,0.82). Among recurrent reactions, food was the principal trigger (90.5%) and most reactions were moderate in severity (73.8%). Injectable epinephrine was used outside of a healthcare facility (HCF) in 52.4% of recurrent reactions and 90% of patients were brought to a HCF. Among patients brought to a HCF, 75.0% received epinephrine during the reaction.

Conclusions: We report an annual incidence rate of 28.8%, higher than previously reported. Cases experiencing reaction to peanut have lower recurrence risk potentially due to higher vigilance or ease in avoiding products containing peanut. Limited sample size and low response may have affected these estimates.

Background

- Recent studies suggest an increase in the incidence of anaphylaxis [1, 2]
- Even when a trigger for anaphylaxis can be identified, patients remain at risk for recurrence.
- In a retrospective cohort study, Decker et al found that among 211 patients with anaphylaxis 21.3% had a second event and 5.2% had a third event [2].
- Gonzalez-Perez et al identified 82 / 382 (21.5%) patients had more than one episode of anaphylaxis [3].
- In a cohort of children and adults with previously identified anaphylaxis, Mullins reported 10% had a serious recurrence [4].
- There have been no prospective studies assessing the recurrence of anaphylaxis.

Objectives

- Identify the recurrence rate of anaphylaxis in a cohort of children presenting to the ER
- Determine the pre-hospital and emergency room management of children with recurrent anaphylaxis

References

1. Ben-Shoshan M, Turnbull E, Clarke A: Food allergy: temporal trends and determinants. *Curr Allergy Asthma Rep* 2012, 12(4):346-372.
2. Decker WV et al. The etiology and incidence of anaphylaxis in Rochester, Minnesota: A report from the Rochester Epidemiology Project. *JACI* 2008; 122 (6): 1161 - 1165.
3. Gonzalez-Perez et al. *Anaphylaxis epidemiology in patients with and patients without asthma: A United Kingdom database review.* *JACI*, 2010, 125 (5), 1098-1104.
4. Mullins RJ. Anaphylaxis: risk factors for recurrence. *Clin Exp Allergy* 2003; 33: 1033-1040.

Methods

•As part of the Cross-Canada Anaphylaxis REgistry (C-CARE), children presenting to the Montreal Children's Hospital ED and Sacre-Coeur Hospital with anaphylaxis were recruited.

• Patients were contacted by telephone and queried on any further allergic reactions annually after recruitment.

•allergic reactions were classified as being non-anaphylactic reactions or anaphylaxis, by the involvement of two or more organ systems.

•anaphylaxis was further classified according to severity, as follows:

•mild anaphylaxis

•involvement of at least two organ systems but not qualifying as moderate or severe, as defined below

•moderate anaphylaxis

•crampy abdominal pain, diarrhea, recurrent vomiting, hoarseness, barking cough, difficulty swallowing, stridor, dyspnea, or moderate wheezing.

•severe anaphylaxis

•loss of bowel control, cyanosis or saturation <92%, or respiratory arrest.

Results

•Between April 2011 and April 2013, 266 children presented with anaphylaxis

•96 patients [36.1%] completed the telephone questionnaire.

•Respondents were younger (median age 3.6 vs. 6.5 years) and more likely to have had severe anaphylaxis at baseline (10.4% vs. 2.9%) than non-respondents

•There were 42 episodes of anaphylaxis in 25 patients.

•Among those with recurrent anaphylaxis, median age was 4.2 years (IQR 1.5,14.2) and the majority were males [56%, 95% CI (34.9, 75.6)].

•Children with recurrent anaphylaxis were less likely to have peanut as a trigger [Hazard ratio 0.29, 95% CI 0.11,0.82]

•Food was the principal trigger [90.5% 95% CI (77.4, 97.3)].

•Most reactions were of moderate severity [73.8%]

•Injectable epinephrine was used in 52.4% (95% CI 36.4, 68) of recurrent anaphylactic reactions.

•90% (95% CI 76.3, 97.2) of patients were brought to the ED.

•Among those brought to the ED, 75% (95% CI 57.8, 87.9) received epinephrine either before arrival in ED, or in ED.

Tables & Figures

Table 1: Demographic and clinical characteristics at baseline of those with and without recurrent anaphylaxis

	With recurrence (n = 25)	Without recurrence (n = 71)
Age (IQR)	4.2 (1.5,13.2)	3.5 (1.2, 9.7)
Gender (% male)	56 (34.9, 75.6)	49.3 (37.2, 61.4)
Trigger for reaction:		
Food, any (%)	100 (86.3, 100)	87.1 (77.0, 93.9)
Peanut (%)	16 (4.5, 36.1)	31.4 (20.9, 43.6)
Insect Sting (%)	0 (0, 13.7)	5.7 (1.6, 14)
History of Asthma (%)	30.4 (13.2, 52.9)	17.6 (9.5, 28.8)
History of Eczema (%)	34.8 (16.4, 57.3)	29.4 (19, 41.7)
Severity of Anaphylaxis:		
Severe* (%)	0 (0, 13.7)	14.1 (7, 24.4)
Moderate** (%)	64 (42.5, 82)	45.1 (33.8, 57.3)

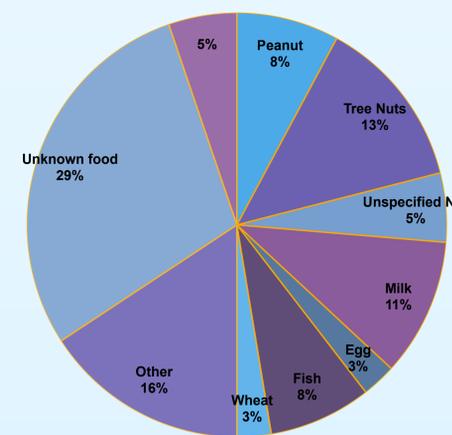
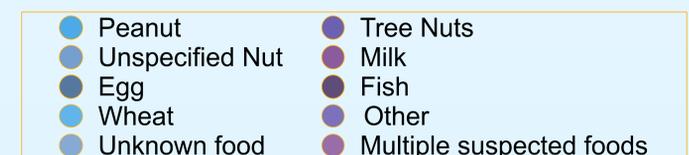


Figure 1: Trigger of recurrent reactions



Conclusion

- The annual incidence of recurrent anaphylaxis is 28.8% (95% CI 20.7, 38.9)
- Limitations of the study include a low response rate, and that respondents were more likely to have had a severe reaction than non-respondents.
- This may explain the higher than expected recurrence rate observed here
- Children with recurrent anaphylaxis were less likely to have peanut as a trigger
- Epinephrine autoinjectors were underused prior to ED arrival
- Most children presented to the ED (90%), and among those who did, most received epinephrine at some point during their reaction.

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