



Low Use of Epinephrine for Treatment of Anaphylaxis in Restaurants

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ABSTRACT (abbreviated summary)

Rationale: Evaluate clinical characteristics and management of anaphylaxis in restaurants, an area lacking prospective studies.

Methods: Retrospective and prospective anaphylaxis cases were recruited from the 2011 Cross-Canada Anaphylaxis Registry emergency departments in 5 provinces. Data was collected on sociodemographic factors, clinical characteristics, reaction location, and management based on a standardized questionnaire. Only reactions occurring in restaurants were included. Factors associated with epinephrine use were identified using logistic regression.

Results: Of 695 cases, 144 occurred in restaurants, including 114 children. Outpatient epinephrine use was low (38.2%), even among those with known food allergies,. Epinephrine use was more common in cases with known food allergy, moderate reactions, and peanut-triggered reactions. Peanut was the most common trigger.

Conclusions: Outpatient epinephrine use was low among participants who suffered anaphylaxis in a restaurant. There is a need for educational programs and allergen avoidance for all involved, and potential restaurant policies should be adopted.

BACKGROUND

- Studies suggest that food allergy and anaphylaxis are increasing, and that fatality may occur outside the home
- No large-scale prospective studies have assessed the management of anaphylaxis in restaurants

OBJECTIVES

- Evaluate overall use of epinephrine in cases of anaphylaxis occurring in restaurants
- Evaluate clinical characteristics of said cases
- Evaluate the inpatient and outpatient management performed

METHODS

- We used the Cross-Canada Anaphylaxis Registry, a cohort study established in 2011 from emergency departments spanning 5 provinces (prospective and retrospective cases).
- We only included cases occurring in restaurants, and those meeting criteria of anaphylaxis as per position statement from the European Academy of Allergy and Clinical Immunology.
- We collected data on sociodemographic factors, clinical characteristics, reaction location, and management based on a standardized questionnaire.
- Factors associated with epinephrine use were identified using logistic regression.

Use of epinephrine for the treatment of anaphylaxis in restaurants was low (38.2%).

No poor outcomes in this small Canadian study. However, the incidence of food allergy is growing worldwide, and can potentially be fatal.

PROPOSAL – we need to: Promote epinephrine use, allergen avoidance, auto-injector training, and stocking of auto-injectors.

BASIC TABLES

Population Characteristics		Reactions		Treatment +		
CHARACTERISTIC:	VALUE:	KNOWN ALLERGY:	(of n =143)	REACTION SEVERITY:		
Total	144	Peanut	45 (31.5)	Mild	27	
Age - years		Tree nut	16 (11.2)	Moderate	109	
Median	13.20	Nut	23 (16.1)	Severe	8	
Range	0.7-59.8	Milk	13 (9.1)			
Adults - no (%)	30 (20.8)	Egg	13 (9.1)			
Min.	0.70	Fish	6 (4.2)			
1st Qu.	5.00	Shellfish	10 (7.0)			
Mean	14.49	Soy	6 (4.2)			
3rd Qu.	17.40	Wheat	3 (2.1)			
Max.	59.80	Sesame	10 (7.0)			
N/A	1	Kiwi	3 (2.1)			
		Unknown	5 (3.5)			
Male sex - no. (%)	46					
Location - no. (%)		HISTORY OF :	(of n= 143)			
NFLD	0 (0)	Asthma	19 (13.3)			
HSC	31 (21.5)	Eczema	20 (14.0)			
HSJ	8 (5.6)					
MCH	83 (57.6)					
WEST	8 (5.6)	ACTIVE MEDICATIONS:				
BC	14 (9.7)	Beta-Blocker	1/137 (0.7)			
		NSAIDs	1/137 (0.7)			
Type - no. (%)						
Retrospective	62 (43.1)					
Prospective	82 (56.9)					

TRIGGER – FOODS:		
Peanut	25 (18.4)	
Tree nut	13 (9.6)	
Nut	11 (8.1)	
Milk	9 (6.6)	
Egg	10 (7.4)	
Fish	1 (0.7)	
Shellfish	9 (6.6)	
Soy	0 (0)	
Wheat	2 (1.5)	
Sesame	8 (5.9)	
Kiwi	1 (0.7)	
Other	15 (11.0)	
Unknown	29 (21.3)	
Multiple	3 (2.2)	
Not listed	8 (5.9)	

TREATMENT:	OUTPATIENT	INPATIENT
Epinephrine	55 (38.2)	72 (50)
epi x2	4/55 (7.3)	3 (4.2)
epi x3	1/55 (1.8)	1 (1.4)
Anti-H1	65 (45.1)	77 (53.5)
Anti-H2	0	22 (15.3)
Beta-agonist	7 (4.9)	16 (11.1)
Steroid	1 (0.7)	64 (44.4)
IV Fluids	1 (0.7)	14 9.7)
None	41 (28.5)	9 (6.3)
Prescribed EpiPen on discharge:	109 (75.7)	
Already have	28 (19.4)	
None	6 (4.2)	
N/A	1 (0.7)	
ICU admission	1/144 (0.7)	
All others not admitted, discharged from ER		

RESULTS & CONCLUSIONS

Of the 695 participants:

- 144 anaphylaxis cases occurred in a restaurant
- including 114 (79.2%) children

Only 1 case requiring critical care. No fatalities.

Outpatient epinephrine use was low (38.2%)

- Even among known food-allergic patients (48%)

Epinephrine use was most likely in:

- Known food allergy (OR 1.37; 95% CI 1.16-1.62)
- Moderate reactions (OR 1.22; 95% CI 1.02-1.47)
- Peanut-triggered reactions (OR 1.37; 95% CI 1.16-1.61)

Peanut: most common trigger (18.4% of known)

DISCUSSION

Given low rate of poor outcomes in this study, the need for policy change can be debated.

However, given the growing incidence of food allergy worldwide and extremely low epinephrine use rates, there is clearly a need for educational programs promoting epinephrine use and allergen avoidance for restaurant staff and patrons.

Policies encouraging restaurants to learn how to use and to stock epinephrine auto-injectors are required to improve immediate management.

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REFERENCES:

Muraro, A., et al. "EAACI Food Allergy and Anaphylaxis Guidelines. Protecting consumers with food allergies: understanding food consumption, meeting regulations and identifying unmet needs." *Allergy* 69.11 (2014): 1464-1472.

Kimchi, Nofar, et al. "Anaphylaxis cases presenting to primary care paramedics in Quebec." *Immunity, inflammation and disease* 3.4 (2015): 406-410.