

Beyond the Epi-pen: Prehospital Use of Epinephrine In Anaphylaxis

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Introduction

- Prehospital epinephrine administration has been historically low by the individuals having the reaction, their caregivers, or emergency medical service (EMS) personnel
- With rising anaphylaxis cases, it becomes more imperative that there is appropriate administration of epinephrine to improve outcomes in both pediatric and adult populations

Objectives and Aims

1. Describe most recent anaphylaxis ED visit trends
2. Describe visit details of any that arrived by EMS
3. Identify potential areas of improvement for medications used in the prehospital setting

Methods

- Retrospective IRB approved observational study of all age patients visits in the ED from January 2015 to December 2020
- Patient demographics, mode of arrival, and ED visit medications were electronically extracted
- Visits by EMS were identified and EMS run reports were then manually reviewed and data was extracted: types of medications used prior to EMS arrival (ie. self, parent, or caregiver administration) and during EMS transport
- Descriptive statistics were performed

Results

Table 1– ED and EMS anaphylaxis visit demographics

Demographics		ED Anaphylaxis Patients	EMS Anaphylaxis Patients
Age	0-18	5634 (26.9)	334 (24.2)
	19-36	4357 (20.8)	386 (28.0)
	37-54	5649 (27.0)	227 (16.5)
	> 54	5282 (25.3)	432 (31.3)
Sex	Male	8389 (40.1)	560 (39.1)
	Female	12533 (59.9)	819 (60.9)
Race	White or Caucasian	11357 (54.3)	787 (57.1)
	Black or African American	7897 (37.7)	427 (31.0)
	Asian	508 (2.4)	47 (3.4)
	Alaskan Native or American Indian	81 (0.4)	6 (0.4)
	Other	1079 (5.2)	112 (8.1)

Table 2 - Prehospital medications given

Prior to EMS Arrival	Epinephrine	378 (27.4)
	Antihistamine	459 (33.2)
	Steroids	166 (12.0)
	Other	75 (5.4)
During EMS Transport	Epinephrine	156 (11.3)
	Antihistamine	428 (31.0)
	Steroids	136 (9.8)
	Other	148 (10.7)

Table 3 - Epinephrine use in the prehospital setting

No Epinephrine Given	697 (50.5)
Epinephrine Given Prehospital and Hospital	69 (5.0)
Epinephrine Given Prehospital, not at Hospital	443 (32.1)
Epinephrine at Hospital only	172 (12.5)

Conclusions

- There is good use of epinephrine in the pre-hospital setting for patients arriving via EMS
- A small percentage of patients are requiring repeat doses of epinephrine at the hospital (factors may include short transport time, improvement during transport)
- The population who are receiving epinephrine at the hospital only represents need for increasing education in the prehospital setting

References

1. Song, T. T. & Lieberman, P. (2015). Epinephrine in anaphylaxis. *Current Opinion in Allergy and Clinical Immunology*, 15 (4), 323-328. doi: 10.1097/ACI.0000000000000185.
2. Miles LM, Ratnarajah K, Gabrielli S, Abrams EM, Protudjer JLP, Bégin P, Chan ES, Upton J, Wasserman S, Watson W, Gerds J, Ben-Shoshan M. Community Use of Epinephrine for the Treatment of Anaphylaxis: A Review and Meta-Analysis. *J Allergy Clin Immunol Pract*. 2021 Jun;9(6):2321-2333. doi: 10.1016/j.jaip.2021.01.038. Epub 2021 Feb 4. PMID: 33549844.
3. Michelson KA, Dribin TE, Vyles D, Neuman MI. Trends in emergency care for anaphylaxis. *J Allergy Clin Immunol Pract*. 2020;8(2):767-768.e2. doi:10.1016/j.jaip.2019.07.018