Improving Emergency Care For Anaphylaxis: Impact Of A Clinical Pathway In A Pediatric Emergency Department

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BACKGROUND

Emergency Department management of anaphylaxis has not kept pace with advances in knowledge.

Epinephrine use and utilization of guideline-based practice recommendations remains sub-optimal, particularly in children.

METHODS

To standardize and improve anaphylaxis care in the emergency department, 3 affiliated urgent care, hospital wards and intensive care units.

OBJECTIVE

In anaphylaxis:
1. Epinephrine is the only first line medication.
2. Epinephrine should be given as soon as the diagnosis is suspected.
3. There are no absolute contraindications to the use of intramuscular epinephrine.
4. Intravenous (IV) fluids are indicated for cutaneous symptoms should also receive an H2 antagonist (e.g. ranitidine).
5. Antihistamines do not need to be given immediately.
6. After epinephrine, treat all patients with at least one dose of H1 antihistamine (e.g. cetirizine for those who can tolerate po, diphenhydramine IV otherwise).
7. Patients receiving an antihistamine for cutaneous symptoms should also receive an H2 antagonist (e.g. ranitidine).

CSW RECOMMENDATIONS

Initial Phase – Higher Clinical Concern

- Diagnosis of anaphylaxis – ICD-9: 959.0, 995.6x, 999.6x; ICD-10: T87.0x, T79.2x, T80.5x, T88.6x
- Diagnosis consistent with allergic reaction + intramuscular epinephrine
- We included visits 3 years before to 16 months after initial pathway implementation.

Timeline of important events:
- Sept 2014: Simulations, RN education
- Jan 2015: Place IV line for severe symptoms after 1st dose of epinephrine.
- Jun 2015: Changed from ampules to vials
- Aug 2015: Place IV line on arrival if hypotensive or in bronchospasm, Place IV line for severe symptoms after 1st dose of epinephrine.
- Nov 2015: Place IV line for severe symptoms after 1st dose of epinephrine.
- May 2016: Place IV line for severe symptoms after 1st dose of epinephrine.
- May 2018: Place IV line for severe symptoms after 1st dose of epinephrine.

RESULTS

Time to Epinephrine: After pathway implementation, we found special cause variation with a downward shift in the mean time to epinephrine for Emergency Severity Index 1 patients from 10.8 to 3.8 mins.

IV line placement: The proportion of anaphylaxis patients receiving ED IV line placement decreased from 40% to 21%.

Optimal H1 and H2 Antihistamine use: When an H1 antihistamine was used, the choice of a less-sedating H1 blocker in combination with an H2 blocker increased from 6% to 82%.

Hospital admissions: Proportion of patients admitted to the hospital decreased from 27% before to 19% after pathway implementation.

ED length of stay: Mean ED length of stay (LOS) for discharged patients with anaphylaxis (229 mins) did not change after pathway implementation.

CONCLUSIONS

Anaphylaxis Clinical Standard Work improved many outcome measures, including time to epinephrine for ESI-1 patients, decreased IV line placement, increased optimal antihistamine use, and decreased hospitalizations.

ED length of stay was unchanged. Improvements in efficiency may have been offset by increased adherence to 4-hour observation.