Journal of the American Pharmacists Association 57 (2017) 369–374

Contents lists available at ScienceDirect

Journal of the American Pharmacists Association

journal homepage: www.japha.org

EXPERIENCE

Pharmacist use of the electronic medical record to identify adults at risk for anaphylaxis without epinephrine for self-administration

Autumn Stewart*, Katherine Sulkowski

ARTICLE INFO

Article history:
Received 15 July 2016
Accepted 28 January 2017

ABSTRACT

Objectives: To describe an innovative pharmacist-led approach, with the use of electronic medical record (EMR) data, to identify patients at risk of anaphylaxis in need of epinephrine auto-injector (EAI) for self-administration.
Setting: An urban free health care center for an uninsured indigent adult population in Pittsburgh, PA.
Practice innovation: In this pilot service, patients with allergy history fields containing the words "anaphylaxis," "nut," "bee," or "shellfish" were screened for inclusion.
Practice description: Patients were identified with the use of a report generated by the EMR vendor and were contacted via telephone by a clinical pharmacist. Using the patient-reported clinical history related to anaphylaxis and allergies, the pharmacist assessed the need for EAI, counseled the patient, and provided physician referral when appropriate.
Evaluation: The service was evaluated with the use of a cross-sectional study of patients with electronic records at the health center during the time period studied. Data obtained from patient interviews were used to classify patients who were candidates for EAI and to assess prescribing and access to EAI. Demographic data and outcomes related to the availability of non-expired EAI were collected and analyzed using descriptive statistics.
Results: Ninety-five patients were identified as potential candidates for the service, and 20 patients were able to be contacted via telephone. Fourteen participants provided consent for their data to be used in the program evaluation. A treatment gap likely existed for 11 of the 14 participants (79%) owing to history of anaphylaxis (57%) or history of systemic reaction (29%). The most common indication for EAI was anaphylaxis in response to bee stings.
Conclusion: The findings from this project demonstrate that pharmacist use of EMR data, coupled with patient interview, may be an effective means for identifying treatment gaps in the long-term management of anaphylaxis and has the potential to ultimately improve management of anaphylaxis in patients within the community.

Anaphylaxis is an acute life-threatening systemic allergic reaction typically occurring suddenly; fatality can occur within minutes if untreated.[1,2] In the general population, the estimated prevalence of anaphylaxis in the United States is 1.6%, and an estimated 16% of people may be "at risk" for anaphylaxis.[1,3] In outpatient settings, food is the most common trigger, accounting for 30% of fatal cases of anaphylaxis.[4] The most common foods to cause anaphylaxis are peanuts, tree nuts, fish, and shellfish, but other foods, such as milk, soy, and egg, also can be triggers.[5] Medications, insect stings, and latex are also potential allergens that can cause anaphylaxis.

The diagnosis for anaphylaxis is based on clinical findings and criteria developed by the World Allergy Organization. The identification of anaphylaxis is highly likely when any 1 of the following 3 criteria is fulfilled:

(1) Sudden onset of an illness with involvement of the skin, mucosal tissue, or both and at least 1 of the following: sudden respiratory symptoms and signs, and sudden

Disclosure: All authors and members of immediate family have no conflicts of interest or financial interests in any product or service affiliated with this research, including grants, employment, gifts, stock holdings, or honoraria.
Previous presentation: Portions of this work were presented at the American Pharmacists Association Annual Meeting, San Diego, CA, March 28, 2015, and the Duquesne University Annual Undergraduate Research and Scholarship Symposium, April 9, 2015.
* **Correspondence:** Autumn Stewart, PharmD, BCACP, CTTS, Associate Professor of Pharmacy Practice, Mylan School of Pharmacy, Duquesne University, 600 Forbes Avenue, Pittsburgh, PA 15282.
E-mail address: stewar14@duq.edu (A. Stewart).

http://dx.doi.org/10.1016/j.japh.2017.01.023
1544-3191/

Key Points

Background:

- Anaphylaxis is a potentially fatal allergic reaction prevalent in an estimated 1.6% of the United States' population.
- Guidelines endorse the prescribing of epinephrine auto-injector (EAI) for patients with a history of anaphylaxis and those at increased risk for anaphylaxis based on allergy history.
- However, the majority of patients who are candidates for EAI never receive a prescription or have ready access to it.
- Lack of access to EAI represents a drug therapy related problem that pharmacists may have the potential to identify and resolve.

Findings:

- A pharmacist-led assessment of components in the allergy history as documented in the electronic medical record was an effective strategy to identify patients at risk for anaphylaxis.
- Of the 14 subjects included in the evaluation, 93% had a definite or likely indication for EAI. Of the 8 subjects with a diagnosis of anaphylaxis, 7 participants (87.%) did not have a viable EAI in their possession. Of the 5 subjects identified as likely candidates for EAI, 4 (80%) had it in their possession.
- The positive results observed in this small sample support further implementation and the potential for adaptation to a variety of practice settings where pharmacists have access to electronic medical records.

reduced blood pressure or symptoms of end-organ dysfunction;

(2) Two or more of the following that occur suddenly after exposure to a likely allergen or other trigger for that patient: sudden skin or mucosal symptoms and signs, sudden respiratory symptoms and signs, sudden reduced blood pressure or symptoms of end-organ dysfunction, and sudden gastrointestinal symptoms; or

(3) Reduced blood pressure after exposure to a known allergen for that patient.[2,6,7]

The symptoms vary from patient to patient and from case to case, creating difficulty in the diagnosis of anaphylaxis. However, symptoms usually occur in 2 or more body systems. Common presentations of anaphylaxis include upper or lower airway obstruction, cardiovascular symptoms, and gastrointestinal symptoms.[5]

Epinephrine remains the first-line treatment of choice and should be administered at symptom onset. Studies estimate that 54% of anaphylactic reactions occur in the home; because symptoms can occur suddenly and progress rapidly, delays in administration are possible and are associated with an increased risk of fatality.[1,3,8] To expedite access to treatment, epinephrine for self-administration by patients in the form of epinephrine auto-injector (EAI) is recommended for patients with a history of anaphylaxis and in those at risk for anaphylaxis. Guidelines from the Joint Council of Allergy, Asthma, and Immunology recommend prescribing EAI for the following patient groups[8]:

(1) History of anaphylaxis with possible exposure to the allergen.
(2) History of a systemic allergic reaction.
(3) IgE-mediated food allergy with concomitant asthma.
(4) IgE-mediated allergy to specific high-risk food triggers (e.g., peanut, tree nuts, fish and shellfish).

Despite these guidelines, as many as 52% of patients with a confirmed history of anaphylaxis never receive a prescription for EAI and 60% do not have EAI available.[1]

The Health Information and Technology for Economic and Clinical Health Act emphasizes the "meaningful use" of data within the electronic medical record (EMR) to administer optimal care and improve health outcomes, and mandates minimum population health initiatives.[9] The potential role of EMR data on pharmacy practice and suggested means for integrating pharmacist-driven clinical services into EMR frameworks have been discussed previously.[10,11] Allergy history and related information is routinely gathered by health care professionals in a variety of settings. When entered into specific fields within the EMR, these data become easily searchable, making the identification of individual patients with specific risk factors possible, such as the specific characteristics that place them at risk and as potential candidates for EAI.

Pharmacists are uniquely trained as experts in the recognition and resolution of drug therapy–related problems and work to ensure the appropriate and timely use of medications in the treatment of disease. Considering the gap in timely access to EAIs as a drug therapy–related problem and potential access to allergy history fields in the EMR, pharmacists may be able to improve the long-term management of anaphylaxis in patients at risk.

Objective

To describe an innovative pharmacist-led approach, with the use of EMR data, to identify patients at risk of anaphylaxis in need of EAI for self-administration.

Setting

Located in the downtown area of Pittsburgh, PA, Catholic Charities Free Health Care Center is a free primary and specialty care provider for an uninsured adult population. Patients must demonstrate incomes below 200% of federal poverty limits before receiving care and are seen by volunteer medical providers by appointment only. Clinical pharmacy services were established in the practice, beginning in January 2008, with a focus on medication therapy management services, immunization needs assessments, and medication reconciliation.

Practice innovation

The pharmacy department also oversaw support related to medication access; medications were obtained through a