"My face is swollen!"

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A 43-year-old woman is brought by ambulance to the emergency department (ED). She complains of progressive facial, tongue, and throat swelling. Her husband states she was well until she ate a peach 20 minutes prior. She has no previous medical problems, is not taking any medications, and has no known allergies.

Her initial assessment reveals gross facial swelling (Figure 1) and a muffled voice. Her vital signs are:

- Blood pressure: 114/68 mmHg
- Respiratory rate: 20 breaths/minute
- Heart rate: 128 beats/minute
- Oxygen saturation: 98% on room air

The paramedics started an intravenous line on route, but administered no medications.

Figure 1. Patient with facial swelling.

Questions:

1. *What are important signs and symptoms to assess in a patient with an allergic reaction?*
2. *What is the initial management of a patient with an allergic reaction?*
3. *How long should a patient be monitored in the ED after presenting with an allergic reaction?*

Answers:

1. What are important signs and symptoms to assess in a patient with an allergic reaction?

Allergic reactions range from mild to life-threatening. Mild reactions usually include urticaria or angioedema, whereas life-threatening anaphylaxis affects the cardiorespiratory system (Table 1). Respiratory signs and symptoms include acute upper airway obstruction or lower airway bronchospasm, which clinically can present as stridor or diffuse pulmonary auditory wheezes. Cardiovascular collapse presents as hypotension and tachycardia.

Classic anaphylaxis begins with urticaria, followed by anxiety and a sense of throat fullness and chest tightness. If not treated, patients can quickly progress to cardiorespiratory arrest; 50% of deaths occur within the first hour.

2. What is the initial management of a patient with an allergic reaction?

Anaphylaxis requires rapid assessment and treatment. Securing the airway is the first priority and clinicians should focus on a thorough upper airway assessment while vital signs are assessed and intravenous access is initiated by medical staff. The airway should be examined for signs of angioedema. If angioedema is present, the patient should be intubated urgently because delay could result in complete airway obstruction. Smaller endotracheal tubes may be required and a surgical airway kit should be available as a rescue technique for unsuccessful oral intubations.

Table 1

Organ systems involved in allergic reactions

Organ system	Clinical finding
Skin	Urticaria
Mucous membrane	Edema
Upper respiratory tract	Edema, hypersecretions
Lower respiratory tract	Bronchoconstriction
Cardiorespiratory system	Vasodilation

Table 2

Agents used in the management of allergic reactions

Drug	Adult dose	Indication
Epinephrine	IM: 0.3-0.5 mL of 1:1,000 IV push: 0.1 mL of 1:10,000 (over 3-5 minutes) IV infusion: 0.01-0.05 µg/kg/min	Life-threatening airway edema, hypotension, rapidly progressing urticaria
Diphenhydramine (Benadryl®)	PO/IM/IV: 25-50 mg every 6 hours	All patients
Ranitidine (Zantac®)	IV: 50 mg over 5 minutes	Moderate to severe allergic reactions
Methylprednisone (Solumedrol)	IV: 125 mg	Moderate to severe allergic reactions
Salbutamol (Ventolin®)	Nebulizer: 2.5-5.0 ms, as needed	Dyspnea or respiratory wheeze
Crystalloid infusion	As needed	Hypotension, tachycardia

IM: Intramuscular
IV: Intravenous
PO: Orally

Various medications are used in the treatment of allergic reactions and anaphylaxis, depending on the severity of the clinical presentation (Table 2).

Epinephrine is the cornerstone of treatment for anaphylactic reactions. Moderate reactions should be treated with 0.01 mg/kg of 1:1,000 epinephrine administered intramuscularly.

Intravenous epinephrine is indicated if the patient has severe bronchospasm, laryngeal edema, signs of upper airway obstruction, rapid progression of urticaria, respiratory arrest, or signs of shock. The dose is 0.1 mg (0.1 mL) of a 1:10,000 epinephrine.

If the patient is refractory to the initial bolus, an epinephrine infusion (0.01 µg/kg/min to 0.05 µg/kg/min) should be initiated and titrated for desired effect.

After assessing the need for epinepherine, a number of pharmacologic adjuncts can be considered:

- Intravenous diphenhydramine should be administered to all patients.
- Simultaneous administration of a H2 blocker (ranitidine or cimetidine in patients not on beta blockers) may be beneficial.
- Aerosolized bronchodilators, such as salbutamol, are helpful if bronchospasm is present.
- Corticosteroids are usually given, but have a four- to six-hour onset of action and, therefore, have little or no benefit in the initial, acute treatment of anaphylaxis.

Patients require constant monitoring and re-assessment to determine progression and treatment effect.

3. *How long should a patient be monitored in the ED after presenting with an allergic reaction?*

Patients who exhibit a complete response to initial epinephrine therapy should be monitored for a minimum of four to six hours in the ED. If only a partial response is exhibited, patients should be admitted for observation.

If anaphylaxis is not treated quickly, patients can progress to cardiorespiratory arrest; 50% of deaths occur within the first hour.

Patients who continue to demonstrate life-threatening symptoms require admission to an intensive care unit.

Patients with severe allergic reactions should be prescribed an epinepherine autoinjector and advised to wear a MedicAlert® bracelet at all times.

Oral diphenhydramine can be self-administered by the patient on an as needed basis. Every effort should be made by the patient to avoid contact with any potential inciting agents until followup with an allergist can be arranged. Dx

This department covers selected points to avoid pitfalls and improve patient care by family physicians in the ED. Submissions and feedback can be sent to diagnosis@sta.ca.

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