The administration of epinephrine for severe anaphylactic type allergic reactions

Training for Québec first aiders
2008
Acknowledgements

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• Table des directeurs médicaux régionaux des services préhospitaliers d’urgence
• ÉPIPEN
• TWINJECT
Objectives

• Understand the causes and mechanisms of anaphylaxis

• Know the symptoms and signs required to recognize an anaphylactic reaction

• Know the protocols for administering epinephrine

• Know the mechanisms of action and side effects of epinephrine

• Select the right dose on the person’s weight

• Know how to use the auto-injector
Legal context

- Regulation respecting Professional activities that may be engaged in within the framework of pre-hospital emergency services and care

"In the absence of a first responder or ambulance technician, any person having received training in the administration of adrenalin approved by the regional or national medical director of pre-hospital emergency services may administer adrenalin with an auto-injection device to a person in the case of an acute anaphylactic allergic reaction."
First aider training

- Prerequisite: CPR with exposure to AED

- Take and pass the training
  - Hand in the pre-test at the beginning of the session
  - Pass the continuous practical evaluation

- Length of certification: 3 years
Role and responsibilities of first aiders

• **Role:**
  Reduce the mortality and morbidity associated with anaphylaxis

• **Responsibilities:**
  Comply with the clinical intervention protocols
  It is the responsibility of the organization/employer to make sure that auto-injectors (not expired, right amount of epinephrine) are available.
Definition: anaphylaxis

- Allergic reaction in which the immune system reacts in a sudden and exaggerated way to contact with an allergenic substance (antigen)

- Generally, multiple body systems affected

- Generally, very rapid onset after contact
Common allergens - Causal agents

- Foods
- Venom - insects
- Medications

- Intensity depends on the amount of allergen
Allergens - Foods

- Peanuts
- Nuts
- Seafood
- Eggs
- Dairy products
- Fruit
- Sesame seeds, wheat, and soy

- Very often = respiratory distress
Insect stings

- Bees
- Wasps
- Ants

- Very often = circulatory failure
Allergens - Pharmaceuticals

- Antibiotics
  - Penicillin
  - Sulfas
- ASA and anti-inflammatories
  - Aspirin
  - NSAIDS - numerous
- Iodine
  - Intravenous contrast
- Others
Signs et symptoms - Body systems

- **Respiratory**
  - Difficulty, distress, arrest

- **Cardiovascular**
  - Shock, cardiac arrest

- **Gastro-intestinal**
  - Nausea, vomiting, diarrhoea, abdominal pain

- **Skin**
  - Urticaria, angiooedema, redness

- **Autres**
  - Anxiety, feeling of imminent death
Presence of signs and symptoms

- **No** sign or symptom is *always* present during an anaphylactic reaction
- During the reaction, a number of substances enter into play, including histamine
- Theses substances cause
  - Narrowing of the bronchioles
  - Dilation of blood vessels
  - Skin lesions
Urticaria

- Generally raised
- Migratory

Source: http://www.4-men.org/images/hives.jpg
Angioœdema
Angioœdema

- Most worrisome
  - Upper airway
- Most visible
  - Eyes
  - Lips
Epinephrine - Effects

• The opposite of the anaphylactic reaction
• Dilates the bronchioles
• Increases blood pressure

• Increases the pulse – palpitations
• Anxiety, trembling, nausea, and vomiting

• Effects of short duration
Administration protocols

• Inclusion criteria
  ▫ Known to be allergic
  ▫ Not known to be allergic

• Exclusion criteria
  ▫ None for anaphylaxis
Known to be allergic

- Recent contact with causal agent
  - < 12 hours

- First sign of an allergic reaction
  - Difficulty breathing
  - Weakness, fainting
  - Urticaria, itchiness
Not known to be allergic

- Recent contact with causal agent
  - < 12 heures
  
- Respiratory distress
  or

- Circulatory failure (shock)
  or

- Visible oedema of the tongue
General protocol

- Evaluate safety
  ▫ Potential danger? / Wear gloves
- ABC
  ▫ Call 911 at the same time if 2 first aiders
  ▫ Administer oxygen, if available
- Inclusion criteria? (known to be allergic vs not known)
- If allergic, administer epinephrine based on weight
- Monitoring and first aid
  ▫ Call if alone / 2nd injection, 15 minutes
- Take to hospital - Always
Special situations

- Administer, even if expired
- Repeat every 15 minutes if inclusion criteria remain
- No maximum number of injections
- When in doubt, administer to children
- In adults with MCAS, precautions
Auto-injectors

- Intramuscular injection
- Automatic
- Automatic amount injected
  - Adult = 0.3 mg $\geq 25$ kg
  - Paediatric = 0.15 mg $< 25$ kg
Forest Worker Program
Specifics

- Worker far from EMS, > 30 minutes
- Adults only, so adult CPR prerequisite only
- Before administering, pull down pants to expose thigh
- Call for assistance as per the guide for evacuating and transporting injured forest workers
- MedicAlert® bracelets not worn by forest workers
Administering auto-injectors

- Demonstrations

- The second injection cannot be administered using the Twinject because it is not an auto-injector
Risks related to auto-injectors

• Accidental injection - soiled
  ▫ Squeeze injection site to force bleeding
  ▫ Clean with soap and water, or with disinfectant without water

• Accidental injection – sterile, in finger
  ▫ Hot compresses
  ▫ Downward position
  ▫ Immediately go to hospital emergency room
Summary

- Anaphylaxis: severe allergic reaction
- First-line treatment: epinephrine
- Inclusion criteria different if person known or not known to be allergic
- Amounts
  - Adult: 0.30 mg
  - Paediatric (under 25 kg): 0.15 mg
- Repeat: every 15 minutes
- Always take to hospital
Questions?

Thank you for your attention