



كلية الصيدلة من الهيئة القومية لضمان
جودة التعليم والإعتماد بالجامعة
رقم (102) بتاريخ 2011/9/27

كلية الصيدلة



**DRUG INFORMATION CENTER BULLETIN
FACULTY OF PHARMACY
ASSIUT UNIVERSITY**

Ass. Uni. D.I. Bull., Vol.18, No.2, March 2023

AU-PHA-PIC-30-07



جامعة أسيوط



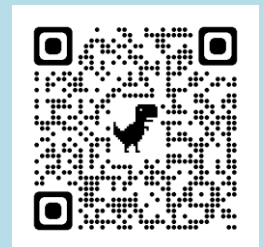
In This Issue...

- ▶ Epinephrine: a life saver in anaphylactic shock
- ▶ Integrative oncology

Common Q&A on epinephrine..... 3

Test Your Knowledge8

Ask the expert.....8



Editorial Board

Prof. Ahmed Mohamed Abd-El Moola
Dean of Faculty of Pharmacy

Prof. Tahani Hassan Elfaham
Supervisor of DIC

Dina Abdel Malek (Lecturer Assistant)
Lamiaa Mahmoud Ahmed (Lecturer Assistant)

Tel. 088/2080388 & 088/2411556
E-mail: clinipharm_assiut@yahoo.com
Website: www.aun.edu.eg/clinipharm
FB Page: facebook.com/DIC.pharmacy

رقم الأيداع: ١٢٦٣٢ لسنة ٢٠٠٥

This Bulletin is a free quarterly periodical issued by the Drug Information Center (DIC) located at Faculty of Pharmacy, Assiut University

Epinephrine: a life saver in anaphylactic shock

Anaphylactic shock is a life threatening condition, which requires immediate and appropriate medical treatment. Although its true incidence is unknown, it is estimated to range from 10–30 cases per 100 000 population per year. The World Allergy Organisation Anaphylaxis Committee defines anaphylaxis as: A serious systemic hypersensitivity reaction that is usually rapid in onset and may cause death. Severe anaphylaxis is characterized by potentially life-threatening compromise in **Airway, Breathing** and/or the **Circulation**, and may occur without typical skin features or circulatory shock being present.” Anaphylaxis can be caused by a broad range of triggers, but the most common allergens identified include **food, drugs and venom** Epinephrine IM injection is the drug of choice in management of anaphylaxis.

	Anaphylaxis (all severities)
Food	Commonest triggers: <ul style="list-style-type: none">• Peanut• Tree nuts• Cow's milk (children)
Drugs	Commonest triggers are antibiotics and chemotherapy drugs <ul style="list-style-type: none">• Antibiotics (Penicillins , Cephalosporins, Co-amoxiclav)• Teicoplanin• Neuromuscular blocking agents (NMBAs)• Chlorhexidine• Contrast agents
Venom	Insect sting or bite, snake bite

Introduction

Epinephrine is one of the most commonly used agents in various settings as it functions as medication and hormone. It is currently FDA-approved for various situations, including emergency treatment of type 1 hypersensitivity reactions, including anaphylaxis, induction, and maintenance of mydriasis during intraocular surgeries and hypotension due to septic shock. Off-label uses of epinephrine include, but are not limited to, ventricular fibrillation, pulseless ventricular tachycardia, asystole, pulseless electrical activity (PEA), croup, and severe asthma exacerbations unresponsive to standard treatment. In the operating room (OR) setting, epinephrine is also used as a local anesthetic block. Produced by the adrenal medulla, epinephrine plays a vital role in the body's acute stress response by stimulating the sympathetic nervous system.

2- Mechanism of action:

Epinephrine (adrenaline) is a sympathomimetic catecholamine that exerts its pharmacologic effects on both alpha and beta-adrenergic receptors. It has a greater affinity for beta receptors in small doses. However, large doses produce selective action on alpha receptors. Through its action on alpha-1 receptors, epinephrine induces increased vascular smooth muscle contraction thus alleviating hypotension and reducing erythema, urticaria and angioedema. Other

significant effects include increased heart rate, myocardial contractility, and renin release via beta-1 receptors. Beta-2 effects produce bronchodilation, which may be useful as an adjunct treatment of asthma exacerbations and vasodilation, tocolysis, and increased aqueous humor production.

3- Administration:

Depending on the diagnosis, epinephrine administration can be in various forms:

1. **For the treatment of anaphylaxis**, epinephrine is preferably injected intramuscularly into the anterolateral aspect of the thigh due to rapid absorption. Subcutaneous injection is also an option.
2. **For advanced cardiovascular life support (ACLS)**, patients can receive epinephrine intravenously or intraosseous if needed.
3. **For neonatal resuscitation**, another route of administration is through an endotracheal tube often used.

Common Q & A

1. When do you need an epinephrine injection? and how is it administered?

Epinephrine should be given immediately at the first sign of a serious allergic reaction, or anaphylaxis. Intramuscular adrenaline is the first-line treatment for anaphylaxis (even if intravenous access is available). A single dose of IM adrenaline is well-tolerated and poses

minimal risk to an individual having an allergic reaction. The best site for IM injection is the anterolateral aspect of the middle third of the thigh. The needle used for injection must be sufficiently long to ensure that the adrenaline is injected into muscle: use a green (21G) or blue (23G) . The subcutaneous or inhaled routes for adrenaline are less effective.

Adrenaline IM dose	Use 1 mg/mL [1:1000] adrenaline
Adult and child* > 12 years:	500 micrograms IM (0.5 mL of 1 mg/ml adrenaline)
6 – 12 years:	300 micrograms IM (0.3 mL)
6 months – 6 years:	150 micrograms IM (0.15 mL)
< 6 months:	100 – 150 micrograms IM (0.1 to 0.15 mL)

*Give 300 micrograms IM (0.3 mL) in a child who is small or prepubertal

2. Why antihistamines or corticosteroids are not used firstly for anaphylaxis?

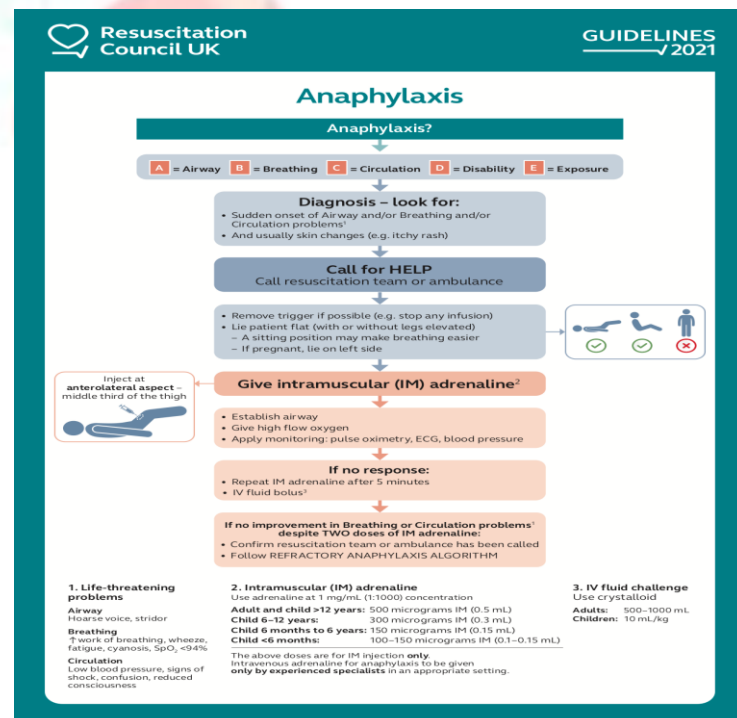
Antihistamines, such as diphenhydramine, have a longer onset of action and longer time to peak activity compared with epinephrine. Antihistamines [IM or intravenous (IV)] are adjunctive therapies and may be tried after epinephrine is administered to help control cutaneous and cardiovascular manifestations, such as itching, flushing, urticaria, rhangioedema, and nasal and eye symptoms, as well as prevent secondary reactions. Similarly, corticosteroids have the potential to prevent recurrent or protracted episodes, but should not be used in place of, or prior to, epinephrine, as they are not helpful for acute symptoms. Moreover, there are emerging data suggesting that early use of steroids is associated with an increased risk of intensive care admission, even after adjusting for severity of presenting symptoms

3. What are Epinephrine auto-Injectors:

An EpiPen® is an auto-injector, but not all auto-injectors are EpiPen. EpiPen and EpiPen Jr® are brand name epinephrine auto-injectors made by Viatrix (formerly Mylan). There are other epinephrine auto-injectors on the market including: AUVI-Q®, Adrenaclick®, SYMJEPi®



Auto-injectors are often prescribed to patients at risk of anaphylaxis for early self-administration or injection by a carer or family member in the event of an anaphylactic reaction. Depending on the brand, they are available in three doses of adrenaline: 150 micrograms (0.15 mg), 300 micrograms (0.3 mg) and 500 micrograms (0.5 mg). Healthcare professionals should be familiar with their use. In all healthcare settings, giving adrenaline from an ampoule by syringe and needle is preferred in an emergency, since auto-injectors will not allow delivery of an age/weight-appropriate dose in most patients. In addition, concerns have been raised as to whether auto-injectors will deliver an IM dose in some patients.



4. How do I know if a person is experiencing an anaphylactic shock?

Look for:

- Sudden onset of **A**irway and/or **B**reathing and/or **C**irculation problems.
- Usually, skin and/or mucosal changes (flushing, urticaria, angioedema)

Skin or mucosal changes alone are not a sign of anaphylaxis and may be absent in up to 20% of reactions. Confusion may arise because some patients have systemic reactions that are not anaphylaxis. Generalised urticaria, angioedema, and rhinitis are not considered to be anaphylaxis because life-threatening features – an **A**irway and/or **B**reathing and/or **C**irculation problem – are not present. However, **if in doubt, give IM adrenaline and seek expert help.**

5. When to give second dose of epinephrine?

A second dose of epinephrine should be given I.M. if symptoms persist 5-15 minutes after the first dose is administered. Sometimes symptoms reemerge between 8 and 72 hours after the first injection. These are called biphasic anaphylactic reactions. You should call 911 or go to your nearest emergency room for medical assistance anytime you administer epinephrine.

Sources:

1. <https://www.ncbi.nlm.nih.gov/books/NBK482160/>.
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4129903/>.
Whyte AF, Soar J, Dodd A, Hughes A, Sargant N, Turner PJ. Emergency treatment of anaphylaxis: concise clinical guidance. Clin Med (Lond). 2022 Jul;22(4):332-339. doi: 10.7861/clinmed.2022-0073. PMID: 35882481; PMCID: PMC9345203.
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2600009/>.
4. <https://allergyasthmanetwork.org/anaphylaxis/what-is-epinephrine/>.

Integrative oncology

Integrative oncology, or integrative medicine (IM), is the use of complementary, or integrative, therapies along with conventional medicine. These therapies work together with standard treatment methods (surgery, chemotherapy, radiation) to treat the patient's body, mind, and spirit. Integrative therapies can help with the goals of treatment, treatment of side effects, distress relief, and may help with treatment results and adherence.



Conventional cancer therapies: cancer treatments that are widely used and have been proven useful in clinical research trials. These are often called standard of care and may include surgery, chemotherapy, radiation therapy, immunotherapy, and/or hormonal therapy.

Complementary and alternative medicines and practices (CAM): are not thought of as standard treatments, though many can be useful to cancer patients. Often, these therapies are not routinely taught in medical schools.



Many types of IM have been studied. Those that may help people with cancer include:

- **Acupuncture.** This ancient Chinese practice may help relieve nausea and vomiting. It also may help ease cancer pain and hot flashes. Be sure your acupuncturist uses sterile needles, since cancer puts you at higher risk for infection.
- **Aromatherapy.** This treatment uses fragrant oils to improve health or mood. It also may help ease pain, nausea, stress, and depression. Although generally safe, these oils can cause allergic reactions, headaches, and nausea in some people.
- **Massage therapy.** This type of bodywork may help relieve anxiety, nausea, pain, and depression. Before you have massage therapy, ask your provider if the therapist should avoid any areas of your body.
- **Meditation.** Practicing meditation has been shown to ease anxiety, fatigue, stress, and sleep problems.
- **Ginger.** This herb may help ease the nausea of cancer treatment when it is used with standard anti-nausea medicines.
- **Yoga.** This ancient mind-body practice may help relieve stress, anxiety, and depression. Before doing yoga, be sure to check with your provider to see if there are any poses or kinds of classes you should avoid.
- **Biofeedback.** This therapy may help ease the pain of cancer. It also may help with sleeping problems.



Immunotherapy for Cancer

Immunotherapy is a type of cancer treatment that helps your immune system fight cancer. The immune system helps your body fight infections and other diseases. It is made up of white blood cells and organs and tissues of the lymph system.

Types of immunotherapy:

Immune checkpoint inhibitors, which are drugs that block immune checkpoints. These checkpoints are a normal part of the immune system and keep immune responses from being too strong. By blocking them, these drugs allow immune cells to respond more strongly to cancer.

T-cell transfer therapy, which is a treatment that boosts the natural ability of your T cells to fight cancer. In this treatment, immune cells are taken from your tumor. Those that are most active against your cancer are selected or changed in the lab to better attack your cancer cells, grown in large batches, and put back into your body through a needle in a vein.

Monoclonal antibodies, which are immune system proteins created in the lab that are designed to bind to specific targets on cancer cells. Some monoclonal antibodies mark cancer cells so that they will be better seen and destroyed by the immune system. Such monoclonal antibodies are a type of immunotherapy. Monoclonal antibodies may also be called therapeutic antibodies.

Treatment vaccines, which work against cancer by boosting your immune system's response to cancer cells. Treatment vaccines are different from the ones that help prevent disease.

Immune system modulators, which enhance the body's immune response against cancer. Some of these agents affect specific parts of the immune system, whereas others affect the immune system in a more general way.

Examples of cancers which treated with immunotherapy:

acute lymphoblastic leukemia, acute myeloid leukemia., adrenocortical carcinoma, breast cancer, cervical cancer.

Sources

-<https://medlineplus.gov/ency/patientinstructions/000932.htm>.

-<https://www.cancer.gov/about-cancer/treatment/types/immunotherapy>.

Real Enquiries

At the “ Drug Information Center” we respond to enquiries from the professional health team as well as from others. Here's one of the enquiries received at the center

Enquiry received from : S.S.- Assiut

Enquiry: What should I do if I miss a dose of Gynera?

Summary of the answer:

You should take the last missed tablet as soon as you remember, even if this means taking two tablets at the same time. Continue to take tablets at their usual time. The next pack must be started as soon as the current pack is finished, i.e., no gap should be left between packs. You

are unlikely to have a withdrawal bleed until the end of the second pack, but you may experience spotting or breakthrough bleeding on tablet taking days.

Sources:

1) Gynera, www.medical-explorer.com/drugs-g/gynera_1.html

2) Gynera Coated tablets, www.old.health.gov.il/units/pharmacy/trufot/alonim/Gynera-eng_1465988880236.pdf

Test Your Knowledge



1. Dyspnea means:

- a) Painful muscle spasm.
- b) Pain in the heart.
- c) Pain in extremities
- d) Painful breathing

2. Which of the following may increase the absorption of iron:

- a) Ascorbic acid.
- b) Al OH₃.
- c) High protein meal.
- d) None of the above.

3. MRI uses the same principle as:

- a) HPLC.
- b) IR.
- c) NMR.
- d) UV-vis.

4. Which of the following tests are typically included in a CBC:

- a) RBC.
- b) WBC.
- c) Hgb.
- d) All of the above.

Answers:

1. (d) 2. (a) 3. (c) 4. (d)

Ask the expert

Question: What is a Rice tablet(حبة الغلة) and how does it cause poisoning?

This is a commonly used pesticide containing Aluminum phosphide (AIP). It liberates lethal phosphine gas when it comes in contact either with atmospheric moisture or with hydrochloric acid in the stomach. The signs and symptoms are nonspecific and instantaneous. The toxicity of AIP particularly affects the cardiac and vascular tissues, which manifest as profound and refractory hypotension, congestive heart failure and electrocardiographic abnormalities. The diagnosis of AIP usually depends on clinical suspicion or history, but can be made easily by the simple silver nitrate test on gastric content or on breath. Due to no known specific antidote, management remains primarily supportive care. Early arrival, resuscitation, diagnosis, decrease the exposure of poison (by gastric lavage with KMnO₄, ingestion of fats or oils such as coconut oil), intensive monitoring and supportive therapy may result in good outcomes.