Pharmacology

Subject : Introduction

Lec no : 1

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وقل رب زدني علماً

للوصول الى guidance الفارما و تفاريغ المادة كاملة :

كل اعمال الفريق العلمي تنشر على قناة التيليغرام

تجدون في guidance مادة الفارما على موقع النادي :

GENERAL PHARMACOLOGY

This chapter provides basic knowledge necessary for subsequent study of individual drugs. Important terms & definitions are presented, together with the two basic areas of pharmacology; pharmacodynamics & pharmacokinetics.

Pharmacology

- It is the science that deals with drugs, their nature, pharmacodynamics, pharmacokinetics, therapeutic uses, adverse effects, preparations and administration.

Drug

modify

- It is a chemical substance that alters body functions and can be used for treatment, prevention or diagnosis of disease.

ممكن أخد دواء عشان عندي تصوير طبي (رنين، طبقي...) هون الدواء ساعد بالتشخيص

Notes

1)

بيشتغل على function موجودة بالجسم من الأساس

Drugs : alters or modify body function by stimulating or inhibiting it.

Gene therapy : change or replace or add functions to the body.

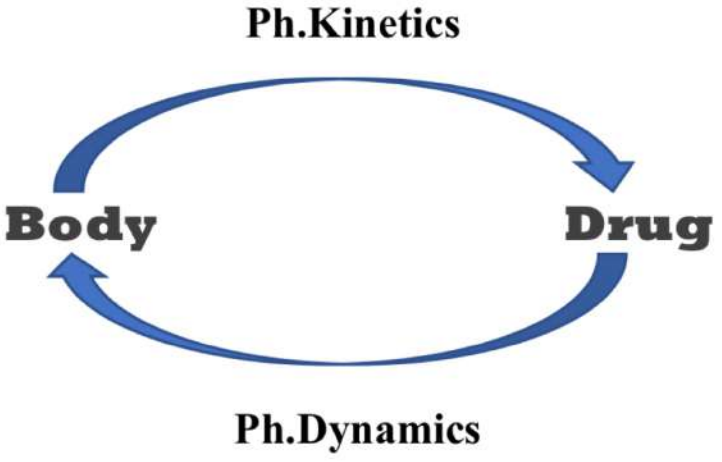
Both of them are used to treat,prevent and cure different diseases.

2)

The drug could work as the sympthatic (which stimulates heartbeats) or as the parasymphatic system (which decrease heartbeats).

Pharmacokinetics

- They are the studies of the **A**bsorption, **D**istribution, **M**etabolism and **E**xcretion of drugs (**ADME**) and their mathematical relationship, i.e. **what body does to drugs.**



Pharmacodynamics

- They are the studies of the biological and therapeutic effects of drugs and their mechanism of action, i.e. **what drugs do to the body.**

Does it stimulate or inhibit...

Pharmacotherapeutics: How to choose the correct and suitable drug

- Study the selection & use of the drugs for treatment, prevention or diagnosis of diseases

Sources of drugs:

1. **Plant:** e.g. atropine from leaves of belladonna + morphine
2. **Animal:** insulin from the pancreas of pigs But it can cause allergy
3. **Mineral**: $MgSO_4$, iodine
4. **Microorganisms:** penicillin from the fungus penicillinum
5. **Synthetic:** in laboratory e.g. aspirin → acetylsalicylic acid
6. **Biotechnology:** human insulin by genetic engineering

Drug nomenclature:

1. **Chemical name:** N-acetyl p-aminophen
2. **Generic name:** Acetaminophen (paracetamol) الاسم العلمي هاد الاسم الي بنتعامل فيه بالفارما
3. **Trade name:** Panadol- Adol الاسم التجاري

الاسم التجاري

An Extra Slide

Atropine : blocks inhibitory effects of the parasympathetic neurotransmitter acetylcholine on heart rate leading to tachycardia.

Iodine: plays an essential role in the functioning of a healthy thyroid gland. It is used for the production of thyroid hormones. And it is used also for detection and diagnoses (fluoresence; we studied about them in Histology)

MgSO4 : ORALLY -> Stimulate the GIT (الملح الإنجليزي)
IV -> helps in convulsions

For knowledge

Routes of Administration	Advantages	Disadvantages	Dosage form
		Enteral	
1) Oral By mouth Then swallow it	Most convenient, Safe, Economical , Easy #1 in safety	*Not suitable for: Unconscious, Uncooperative, excessive Vomiting or Diarrhea, Emergencies, Irritant drugs, drugs destroyed by (gastric acidity, enzymes , 1st pass effect) ex. insuline	*Solid: powder, effervescent granules, tablet (simple, sugar-coated, enteric coated, sustained release; SR), capsule (hard, soft, SR) *Liquid: syrup, suspension, solution
2) Rectal By anus	Escape 1st pass effect, useful if oral is unsuitable: Severe vomiting ,		*Solid: suppository *Liquid: enema
3) Sublingual Under the tongue No swelling	*Escape 1st pass effect, acidity, enzymes *Rapid absorption		*Pellet, spray *(buccal route for local effect: lozenge, wash, paint, gargle)

Explaining some terms in the table.:

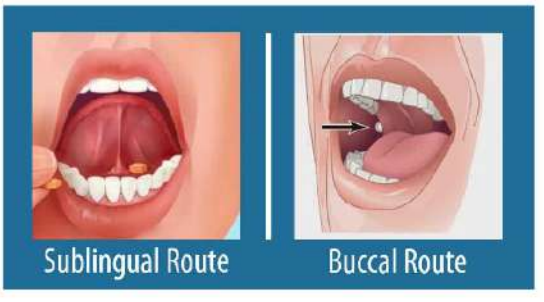
Convenient : little trouble and effort

Uncooperative : such as infants and childrens

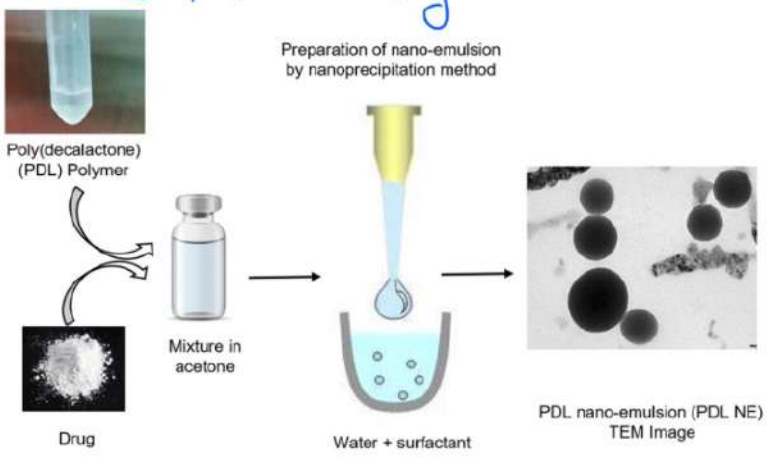
Gastric acidity : the acidity of stomach could break down the drug

1st pass effect : a phenomenon in which a drug gets metabolized at a specific location in the body that results in a reduced concentration of the active drug upon reaching its site of action or the systemic circulation.

Buccal route : placing a drug between your gums and cheek, where it also dissolves and is absorbed into your blood.



oily preparation drug



Preparation of nano-emulsion by nanoprecipitation method

توضيح إضافي
إذا الدواء اله هيك بنعطيه IM لانه امتصاصه سريع.

injection

		Parenteral	
1) Intravenous (IV)	Rapid onset, 100% bioavailab., suitable for emergency and large volume drugs	*Most dangerous (ثلوث / سريع) *transmission of diseases e.g. AIDS *If allergy...> anaphylactic Shock *Pyrogenic reaction *Not suitable for oily preparation, irritant drugs	Ampule (single dose), Vial (multiple doses), bottle
2) Intramuscular (IM)	Suitable for mild irritant drugs, oily preparation	Unsuitable for large volume,	Ampule, vial
3) Subcutaneous (SC) تحت الجلد			*Water solution or fine suspension *SC implant: small rods
		Others	
Inhalation	Excellent absorption due to rich blood supply and alveoli ...>large surface area, porous, thin (نقوب)		Gases, solution (nebulizer) (البخاخ), Fine powder(spinhaler) (كبسولات), vapours of volatile liquids (سائل)
Topical			
1) Local effect	For skin, nose, eye		Ointment, cream, lotion, spray, drops (مرهم دهني) Drops, ointment
2) Transdermal: TDS (Transdermal Delivery System)	Prolonged effect and avoid 1st pass effect e.g. nitroglycerin, estrogen		Patch, ointment, cream

عن طريق الجلد ولكن يحصل لها امتصاص وتصل إلى الدم

Explaining some terms in the table:

Bioavailability : The ability of a drug or other substance to be absorbed and used by the body.

Anaphylactic Shock : causes the immune system to release a flood of chemicals that can cause you to go into shock

Pyrogen reaction : is a febrile phenomenon caused by infusion of solution contaminated, and commonly manifested by cold, chill and fever

irritant drugs : can cause a burning sensation in the vein

QUIZ TIME ⏰

1) Panadol is :

A- Generic name

B- Chemical name

C- Brand name

D- None

2) Which one of the following routes of drug administration produces the most rapid absorption :

A- Inhalation

B- Intravenous

C- Oral

D- Rectal

3) From which of the following routes, bioavailability of the drug is likely to be 100 percent

A- subcutaneous

B- Intravenous

C- Intramuscular

D- Intradermal

4) Distribution of drugs in body fluids compatments occures after :

A- Absorption

B- Metabolism

C- Excretion

D- A + B