

PHARMACOLOGY DOCTOR 2019 | MEDICINE | JU

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INTRODUCTION TO PHARMACOLOGY

HISTORY

• The story of pharmacology is rich in exiting and filled with accidental discovery.

• The oldest forms of healthcare is the herbal medicine.

• Modern pharmacology is thought to have begun in the early 1800s, at which the chemist were making a remarkable progress in isolating active ingredients from a complex mixture such as morphine and cocaine.

(The doctor said that this piece of info isn't crucial so you don't need to memorize it just read it quickly)

• In the 20th century, grow in the phramacology became exponential:

a. no longer needed to rely on the natural sources, hundred of new drugs could be synthesized and tested in relatively short time.

b. it became possible to understand how drugs produced their effect

MEDICAL PHARMACOLOGY COURSE

The study of pharmacological substances which can be used in the treatment (e.g : when a patient with a headache goes to the doctor he treats him by giving him an analgesic) management (e.g : this strategy is usually used with patients with chronic diseases such as diabetes , hypertension , etc ... and achieved by regular check ups on the patients as they might need greater / lower doses of their medications or even a completely different drug for the same chronic diseases due to the changes in their bodies as they age) and cure of disease (some diseases can be cured , other diseases cannot . For example , if a child had cancer and underwent chemotherapy and due to this therapy his malignant disease faded with no return then this therapy was able to cure his disease . On the other hand , some adults' cancers cannot be cured and keep on coming back even after chemotherapy)

ADDITIONAL INFO :

The difference between treatment & cure

1. Cure: usually refers to a complete restoration of health, while treatment refers to a process that leads to an improvement in health, but may not include the complete elimination of disease

2. A treatment: improves a condition and improves the patient's quality of life, while a cure would completely remove the disease from the patient.

WHAT ARE WE SUPPOSED TO LEARN ?

1. How pharmacological agents work through understanding their actions on the body.

2. how they can be applied to patient management.

3. Determining why drugs are toxic to the body, and how to avoid toxic reactions or bad drug interactions.

THE OPTIMUM GOAL OF PHARMACOLOGY

Pharmacology is a keystone for a prescribing doctor, as they can impact proper dosage,

what time a drug should be taken, and how a drug should be delivered.

RESPONSIBILITIES OF PHARMACOLOGY

- You need to know the intended use, effect on the body, contraindications.
- How the medication is to be administrated, including dosage ranges.
- How to Avoid many series adverse drug effect in their patients.

THE ROLE OF PHARM D

1. They participate in patient education

Patient education: Teaching patients how to use drugs the right , proper way

e.g : after prescribing any drug by the doctor , it's the pharm D's responsibility to teach the patient how to use it. (therapeutic sprayer / warfarin + the patient's diet)

2. They need to be able to catch problems with prescriptions

If the doctor prescribes the drug with the wrong dose or gives the patient two drugs that don't work well together , the pharm D must be able to detect the flaws in the doctor's prescription and act depending on this .

(e.g : norepinephrine is a very strong hormone that's why a diluted dose is prescribed for the patients (1/10000) if the doctor mistakenly writes (1/10000) instead of (1/10000), it's the pharm D's responsibility to detect his mistake and correct it .)

a. an unusually high dosage.

b. conflict with another drug a patient is taking.

IMPORTANT TERMS

1) A drug :

A toxic material used for diseases treatment

 ** drugs' toxicity is determined by their dosages and the pathphysiology of the patients .

e.g:

overdose : taking 14 pills of paracetamol a day leads to toxicity as this is a very high dose compared to the universally prescribed dose for adults .

The pathophysiology of the patient :

the patient might have previous diseases such as peptic ulcer and this prevents him from taking specific drugs such as brufen in order not to cause stomach bleeding.

2) Medication: (a very general term)

is a substance administered for diagnosis, cure, treatment, mitigation or prevention. (it represents all the substances and drugs provided to the patient throughout the whole healthcare procedure)

3) Prescription:

the written direction for the preparation and the administration of the drug.

4) The therapeutic effect:

is the primary effect intended that is the reason the drug is prescribed such as morphine sulfate is analgesia.

Some drugs have more than one therapeutic effect but most of the time we use them for one specific effect .

e.g : morphine has multiple therapeutic effects (caugh suppressant , analgesic, anesthetic , etc) but is mainly taken as a painkiller.

5) Side effects:

secondary effect of the drug is one that unintended, side effects are usually predictable and may be either harmless or harmful

e. g: morphine has multiple side effects such as : respiratory depression, pupil dilation , constipation , and euphoria .

Some of these side effects (pupil dilation , for example) are harmless and it's ok to have them

BUT other ones are harmful and have risks (respiratory depression, for example), these are called adverse effects and when dealing with such effects you need to stop taking the medication Harmful side effects = adverse effects

6) Drug toxicity:

Deleterious effect of the drug on an organism or tissue, result from overdose or external use.(or the pathophysiology of the patient)

e.g:

High intakes of paracetamol (14 pills / 500 mg) > glutathione depletion / break down in the liver > liver failure

7) Drug interaction:

occur when administration of one drug before or after alter effect of one or both drug.

e.g:

Drug A is metabolized by enzyme A

Drug B > inhibits enzyme A > inhibits drug A metabolism > drug A accumulates in body tissues and blood

(Along with drug-drug interaction , there are also food - drug interactions)

e.g:

P - glycoprotein is a pump which participates in detoxification and pumping of toxic substances (including drugs) to the GI tract to leave the body through urination and defecation.

So when we take a drug such as statin 10 mg , 10% will be absorbed by the cells and 90% will be pumped to the GI tract , but if we drink grapefruit after taking the drug , it will inhibit P - glycoproteins, which means pumping to the GI tract will also be inhibited , and 100% of the drug will enter the cells leading to rhabdomylosis (الوهن العضلي).

8) Drug misuse:

Is the improper use of common medications in way that lead to acute and chronic toxicity for example laxative, antacid and vitamins. (patients don't use / administer their drugs the right way unintentionally)

e.g:

A. an athlete injured his ankle and started taking diclofenac as an analgesic, he felt the pain isn't fading so he started taking one pill of diclofenac each 3 hours instead of 6 and this led to stomach bleeding.

B. A patient went to the dentist and faced severe pain after his appointment, he started taking paracetamol but the pain wasn't fading simply because paracetamol isn't designed to relieve teeth pain, so he kept on taking more and more of paracetamol, until he exceeded the safe dosage limit (overdose of paracetamol may lead to liver failure)

C. Patients with heartburn take antacids to control their medical condition, some patients overtake it and this leads to problems in the GI (deficiency in absorption), and vitamins + minerals deficiency. (chronic effect = regular intake)

D. Huge intakes of laxatives may cause dehydration , hyponatremia , and hypokalemia . (chronic effect = regular intake)

9) Drug abuse: is an inappropriate intake of substance either continually or periodically.

Patients in this case intend to take high doses of drugs (sth similar to addiction)

e.g : lyrica / Heroin /Marijuana

10)Drug dependence:

is a persons reliance on or need to take drug or substance there are two type of dependence:

• Physiological dependence: is due to biochemical changes in the body tissue these tissue come to require substance for normal function.

This means you can't stop taking a certain drug suddenly, there must be a gradual "exit" from the " treatment " due to the fact your body is used to it.

e.g :

A. cortisone (glucocorticosteroid) is produced by the adrenal cortex . When taking cortisone from an external source the adrenal cortex stops synthesizing it that's why when the patient decides to stop taking the medicine his doctor needs to lower the dose gradually for him to prepare the patient's gland to resynthesize cortisone again

B. Antidepressants need 8 weeks of usage to make changes in the biochemistry of our brains and bodies , so when we decide to stop taking them we need other 8 weeks of gradual dose lowering to achieve proper exit . What if we stopped them suddenly?

We'll deal with nervousness , uncertainty, vomiting, eating disorders, etc .

• Psychological dependence: is emotional reliance on a drug to maintain a since of wellbeing accompanied feeling of need.

e.g : smoking ; as smokers believe that smoking boosts their moods and cheer them up , so they need to terminate this bad habbit by gradual dosage lowering .

NOTE : smoking also causes physiological dependence due to nicotine intake .

The end