UNIT-II

Posology

It is the branch of pharmacology, which deals with dosage of drugs.

Drug
It refers to any substance that brings about a change in biological function through its chemical action.

Pro-Drug
It refers to compounds that, on administration, must undergo chemical conversion by metabolic processes before becoming an active pharmacological agent. (Levodopa into dopamine)

Placebo
It refers to an inactive substance or preparation given to satisfy the patients symbolic need (psyche need) for drug therapy, and used in controlled studies to determine the efficiency of medicinal substance.

Dose

Amount of drug taken each time by an individual or a quantity to be administrated at one time. (20mg, 10mg, 2drops etc)

Dosage

The amount of a drug given to an individual per unit body weight or the determination and regulation of the size, frequency and number of doses.

Dosage Types

Therapeutic Dose
Average dose for an adult to produce a therapeutic effect is called therapeutic dose.

Loading Dose
A large dose initially used to produce an effective concentration as quickly as possible is called loading dose.

Maintenance Dose
A dose used to maintain the therapeutic effect or concentration in blood plasma is called maintenance dose.

Maximal Tolerated Dose
Largest dose of a drug that can be taken safely.

Toxic Dose
Amount of drug, which produces undesirable harmful effect of serious nature, is called toxic dose.

Fatal Dose
A dose that produces death is called fatal dose.

Dose Calculation
Adult dose is for a person between the age of 18-60years. Children are given small dose. Children dose may be calculated as a fraction of adult dose.

Young's Formula

Young's formula is used to calculate doses for children (2-17years old) based on the adult dose.

$$\text{Child's Dose} = \frac{\text{age in years} \times \text{Adult dose}}{\text{age in years} + 12}$$

Clark's Formula

Clark's formula is used to calculate doses especially for infants (birth to 1year old) by using weight of infant in pounds (lbs).

$$\text{Infant Dose} = \frac{\text{infant weight in pounds} \times \text{adult dose}}{150}$$

Factors Modifying The Action And Dosage Of Drug

Many factors influence the dosage and action of drug. If the drug is too small, the drug will not produce the desired action. If it is too large it will produce toxic effects, which are not desirable. Following are important factors, which influence the action and dosage of drug.

- **Age**
- **Body weight**
- **Sex**
- **Routes of administration**
- **Time of administration**
- **Dosage form**
- **Absorption, Distribution and excretion of drug**
- **Pathological condition**
- **Tolerance**
- **Combination of drugs (synergism, antagonism)**

Age
Adult dose is for a person between the ages of 18-60years. Children are given small dose. We use young's formula and Clark's formula to calculate dose for children and infant. Above 60years of age the dose should be decreased $3/4^{th}$ of adult dose.

Body Weight
For abnormal body weight the dose of the drug should be suitably adjusted according to the weight of the patient

Sex
Doses for the women should be less than man because women are usually having more effect than men. Pregnancy, menstruation and lactation periods should keep in mind while adjusting dosage.

Routes Of Administration
When drug is given intravenously onset of action is rapid orally given drug have slow onset action. Oral dose of drug always greater than when it is given parenterally and dose for subcutaneous or intramuscular injection is greater than intravenous.

Time Of Administration
Presence of food in stomach delays the absorption of drug onset action is slow some drugs can cause irritant, nausea and vomiting while given in empty stomach. Hypnotics are more effective when given at bedtime.

Dosage Form Of Drug (Preparation)
Onset action is rapid when the drug is given in liquid or as a powder as compared to drug given inform of a tablet of pill.

Absorption, Distribution And Excretion Of Drug
Drugs, which are rapidly absorbed and excreted quickly, cannot maintain effective concentration for therapeutic effect. Drugs, which are quickly absorbed but excreted slowly, may produce toxic effect.

Pathological Condition
When liver or kidneys are not functioning properly the dose should be decreased to avoid toxic effects.

Tolerance
It is unusual resistance to ordinary dose of the drug-increased dose is often required to obtain desired therapeutic effects

Combination Of Drugs
When two or more than two drugs are given together action may be increased or decreased.