PHARMACEUTICAL INCOMPATIBILITY

BP103P - PHARMACEUTICS UNIT 4

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PHARMACEUTICAL INCOMPATIBILITY

- When two or more ingredients are mixed together to prepare a medicine and an undesired change takes place which affect the physical , chemical and therapeutic properties of medicament then the phenomenon is termed as incompatibility.

- Incompatibility are usually unintentional

INCOMPATIBILITY MAY OCCUR DURING

- Compounding
- Formulation
- Manufacturing
- Packaging
- Dispensing
- Storage
- Administration

INCOMPATIBILITY CAN AFFECT

- Safety of medicament
- Efficacy of product
- Appearance of medicine
- Purpose of medicament

TYPES OF PHARMACEUTICAL INCOMPATIBILITY

1. Physical Incompatibility
2. Chemical Incompatibility
3. Therapeutic Incompatibility

PHYSICAL INCOMPATIBILITY

- When two or more than two substances are combined together and a physical change takes place which results in the formulation of an unacceptable product, then this phenomenon is known as Physical Incompatibility.

- Physical incompatibility involves interaction between two or more substance which leads to change in colour , taste , viscosity or appearance of the product.

- The changes that occurs due to physical incompatibility are usually visible and can be corrected by taking proper action.

CORRECTION OF PHYSICAL INCOMPATIBILITY

- Changing the order of mixing
- Emulsification
- Addition of suspending agents
- Change in the form of ingredient
- Addition or substitution of a therapeutically inactive substance.

EXAMPLE OF PHYSICAL INCOMPATIBILITY

- Immiscibility
- Insolubility
- Precipitation
- Liquefaction

IMMISCIBILITY

Oils and water are immiscible with each other, but they can be made miscible by emulsification.

Example –

Caster oil - 15 ml
Water - 60 ml
make an emulsion

Now in the above preparation caster oil is immiscible with water, to overcome this incompatibility an emulsifying agent is used to make a good emulsion.

INSOLUBILITY

Insolubility takes place when a drug is insoluble in a particular solvent.
Example :

Ephedrine sulphate	-	0.25 gm
Menthol	-	0.2 ml
Liquid Parafin	-	30 ml

Now in the above preparation ephedrine sulphate is not soluble in liquid paraffin but anhydrous ephedrine is soluble in it, hence ephedrine sulphate is substituted with anhydrous ephedrine in the above prescription to make a clear solution.

PRECIPITATION

A drug in a solution may be precipitated, if it is insoluble in the solvent in which it is added.

Example:-

- ✓ Resins are insoluble in water, when it is added in the water it gets precipitated.
- ✓ It can be prevented by adding a suitable thickening agent.

LIQUEFACTION

When two or more solid having low melting point are mixed then get converted into liquid

Example:-

- ✓ If medicament containing menthol, thymol, camphor, phenol etc mixed together, they gets converted into liquid.
- ✓ To prevent liquefaction, ingredients should be either dispensed separately or may be mixed with enough quality of absorbent powder.

CHEMICAL INCOMPATIBILITY

- Chemical incompatibility is the result of change in chemical properties of two or more ingredients due to the chemical reaction occurs between them.
- Chemical incompatibility results in the formulation of a toxic or inactive dosage form.
- If the chemical reaction between ingredients take place immediately then it is termed as immediate incompatibilities.
- If the chemical reaction takes place over a period of time then it is termed as **delayed incompatibilies.**

CHEMICAL INCOMPATIBILITIES OFTEN OCCUR DUE TO

- Oxidation
- Acid-base hydrolysis
- Combination Reactions
- pH change

- These reaction can be noticed by precipitation, decomposition, colour change , explosion.

TYPES OF CHEMICAL INCOMPATIBILITIES

Tolerated : In tolerated incompatibilities, we change the order of mixing or diluted the substances to overcome the chemical reaction between ingredient.

Adjusted: In adjusted incompatibilities, we directly add or remove a substance to overcome the chemical reaction between ingredients.

THERAPEUTIC INCOMPATIBILITIES

- Therapeutic incompatibility may be the result of prescribing certain drugs to the patient with the intention to produce a specific degree of action but the nature or intensity of the action produced is different from that intended by prescriber.

Causes of Therapeutic Incompatibilities

- Overdose / Improper dose of a single drug
- Improper dosage form
- Contraindicated drug
- Synergistic and Antagonistic drugs

EXAMPLE OF OVERDOSE

Codeine Phosphate ……. 0.5 gm

Direction for Pharmacist –

- Make powders
- Send such 10 powders
- 1 dose to be taken at bed time

In the above prescription , physician write 500 mg (0.5 gm) instead of 5 mg of codeine phosphate.

EXAMPLE OF DRUG INTERACTION

Tetracycline Hydrochloride …… 250 gm

Direction for Pharmacist –

- Make capsule, send such 10 capsules.
- Take 1 capsules every 6 hours with milk

Now in the above prescription dose is alright but the direction is wrong, tetracycline should not be given with milk because the calcium that present in milk inactivates the action tetracycline.


Thank You