

PHARMACEUTICS-I (BP103T)

UNIT: 4 (Suppositories, Pharmaceutical incompatibilities)

CLASS: 4

TOPIC: Pharmaceutical incompatibility

Pharmaceutical Incompatibility “It is defined as when two or more ingredients of a prescription are mixed together, the undesired changes that may take place in the physical, chemical or therapeutic properties of the medicament is termed as incompatibility.” Incompatibilities occur during: • Compounding • Formulation • Manufacturing • Packaging • Dispensing • Storage • Administration of drugs.

Classification of Incompatibility 3 classes of drug incompatibility

• Physical incompatibility • Chemical incompatibility • Therapeutic incompatibility

Physical Incompatibility

• It is evidence that failure of the drug combines properly. • In physical incompatibility involves interaction between two or more substances which leads to change in colour, odour, taste, viscosity & morphology. • It is a result of insolubility & immiscibility, precipitation, liquefaction, adsorption & complexation of solid materials. Physical incompatibilities can be corrected by one or more methods viz. • Order of mixing • Alteration of solvents • Changes in the form of ingredients • Alteration of volume • Accurate choice of emulgent & suspending agent • Addition

Examples of physical incompatibilities

1. Immiscibility

Immiscibility is the result of the mixture of two or more immiscible liquids. Oils and water are immiscible with each other. They can be made miscible with water by emulsification.

Example:

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Castor Oil 15 ml

Purified Water up to 60 ml

Make an emulsion.

To overcome this incompatibility an emulsifying agent is used to make a good emulsion.

2. Insolubility

It means the inability of material to dissolve in a particular solvent system. The liquid preparations containing In-diffusible solids such as chalk, aromatic chalk powder, acetyl salicylic acid, phenacetin, zinc oxide & calamine etc. are insoluble in water.

Example:

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Phenacetin 3 gm

Caffeine 1 gm

Orange syrup 12ml

Water up to 90ml

Make a mixture.

In above example, phenacetin is an in-diffusible substance. Compound powder of tragacanth or mucilage of tragacanth is used as a suspending agent to make stable suspension. Method of Correction- suspending agent- chalk, aromatic chalk powder, acetyl salicylic acid, phenacetin, zinc oxide and calamine etc. are added in liquid preparations as a in-diffusible solids, so as to increase the thickness of the preparation. It also helps to maintain uniform distribution of the insoluble substances for sufficient long time after shaking the bottle and facilitating uniform measurement of each dose.

3. Precipitation

It occurs due to solvent is insoluble when it is added to solution. A drug in solution may be precipitated, if the solvent in which it is insoluble is added to the solution e.g. resins are insoluble in water. Volatile oils are soluble in alcohol. When water is added into the alcoholic solution of volatile oil, the non-aromatic portion of the oil get precipitated & turbidity appears. Liquid preparations especially those containing syrups may show crystallization of sugar in the closure, resulting in cap locking. It can be minimized by adding co-solvents like glycerine, propylene glycol or sorbitol E.g. Alcoholic solution of resins + water =precipitated resins.

Example:

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Tincture benzoin compound 5g

Glycerine 10ml

Rose water up to 100ml

Make a lotion

Causes: - Tincture benzoin compound contain resins. This change in solvent system results in an unavoidable precipitate.

Remedy: - Addition of tincture with rapid stirring yields a fine colloidal dispersion. So there is no need of any suspending agents. Method of correction- by adding some suitable thickening agent.

4. Liquefaction

When certain low melting point solids are mixed together, a liquid or soft mass known as “Eutectic Mixture” is produced. This occurs due to the lowering of the melting point of the mixture to below room temperature and liberation of hydrates. The medicaments showing this type of behaviour are Camphor, Menthol, Phenol, Thymol, Chloral Hydrate and aspirin.

Causes: - This mixture is a physical incompatibility because both the ingredients in the prescription are liquefiable of mixed together.

Remedy: - These substances can be dispensed by any one of the following methods. Triturate together to form liquid and mixed with an absorbent (light kaolin, magnesium carbonate) to produce the following powder. The individual medicaments are powdered separately and mixed with an adsorbent and then combined together tightly and filled in a suitable container.

Example:

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Menthol 5 gm

Camphor 5 gm

Ammonium chloride 30 gm

Light Magnesium carbonate 60 gm

Make an insufflations

In this prescription Camphor, menthol and Ammonium chloride get liquefied on mixing. To dispense this mix, them and triturate together to form liquid. Add light magnesium carbonate and mix it thoroughly to make free flowing powder.

2 MARKS QUESTIONS

1. What is pharmaceutical incompatibility?
2. Define physical incompatibility.

5 MARKS QUESTIONS

1. Explain about any two reasons of physical incompatibility with examples.

10 MARKS QUESTIONS

1. Discuss about physical incompatibility with examples.

RRP