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Diploma in Pharmacy 2nd Year
Hospital & Clinical Pharmacy
Chapter 5 : Compounding In Hospital

Chapter 5
Compounding In Hospital

- Compounding is a process of combining , mixing or altering in drug ingredients for developing a drug to fulfill the specific need of a patient . It is done when no approved drug is appropriate for patient .
- Compounding is typically done under the supervision of a licensed pharmacist and must adhere to strict guidelines to ensure the safety and effectiveness of the compounded medications.
- Due to the compounding, we make the suitable doses and formulation according to the patient/disease conditions.
- Now a days, compounding is very easy because many combinations drugs are already present in the market.

Ideal requirement for the compounding

- Compounding platform.
- Lab coat and gloves.
- Sterile equipment's like mortar and pestle.
- Sterile container and closers.
- Packing material etc

Objectives

- To convert solid form to liquid.
- to avoid an allergic ingredient like coloured dyes.
- To provide an exact dose that is not available in market.
- To mask an unpleasant taste.
- Two minimize multiple dosing.

Bulk Compound

- When any drug compounded in bulk (big amount) it is called bulk compounding it is required when same medication are prescribed more and more in a specific are.
- Involves the preparation of large quantities of a medication for use in the hospital.
- This can include creating new formulations of medications, adjusting the strength of medications, or combining multiple medications into a single dose.

Control Systems In Compounding

- **Compounding process control :** During compounding the standard process should be applied to obtain good strength , quality and purity of drug .
- **Quality control :** It is a process to check the quality , purity or strength of a developed product .
- **Budgetary control :** The budget of hospital should also be considered during making a program for bulk compounding .

Requirements for bulk compounding in hospital

- **Manufacturing facilities :** The place where drug are being compound should be clean at high degree . it should be smooth construction specially walls and floor which are easy to clean .
- **Raw Materials :** After deciding the drug to be compounded , its raw materials should be bought of good quality and in sufficient quantity .
- **Equipments :** The equipments are required for specific drugs should be available .
- Staff : there should be enough staff according to workload

I V Admixture Services

→ IV admixture is the combination of one or more sterile products added to an IV fluid for administration.

→ It is also defined as a pharmaceutical mixture of two or more drugs into a large bag or bottle of IV fluid.

Preparation of IV Admixture

1) The admixture should be prepared according to the directions of physician .
2) According to the physicians order a label should be prepared including
    - Name and address of patient and location
    - Name of physician .
    - Name of drug with quantities.
    - Date of compounding and expiry date
    - Name of pharmacist who prepared Admixture .
3) The admixture should be prepared under laminar flow hood / cabinet using sterile needles and syringe .
4) After adding the drugs the solution should be mixed properly .
5) Before using the admixture solution , it should be checked carefully to satisfy that there is no incompatibility
6) Before dispensing the final admixture preparation to use ,the pharmacist should inspect the label and calculation etc .

Advantages of IV Admixtures

- ✓ IV admixtures extend the expiration period.
- ✓ Their preparation process is time saving.
- ✓ They provide large amount of nutritive fluids (glucose and electrolytes) and nutrients to the body.
- ✓ They have a quick onset of action.
- ✓ They can be administered to patients who are vomiting and are unconscious.
- ✓ They provide effective, safe and high quality of patient care.

Disadvantages IV Admixtures

- IV admixtures have a high risk of incompatibility.
- They need skill and time.
- They need aseptic area, special storage equipment. like refrigerator.
- They need trained pharmacists.
- They have a risk of bacterial contamination.
- They have a higher risk for adverse reactions.

Incompatibility of IV Admixture

→ Incompatibility is an unwanted reaction that occurs between the drug to drug , fluid or containers . and unable to show required effect. like :

- Synergism (increase in drug efficiency)
- Antagonism
- New effects like toxic effect.

Types of Incompatibility of IV Admixture

- ➢ Physical Incompatibility
- ➢ Chemical Incompatibility
- ➢ Therapeutic Incompatibility

- ❖ **Physical incompatibility :** When visible changes occurs after mixing two or more drugs , it is called physical incompatibility for example change in colour , formation of precipitate etc
- ❖ **Chemical incompatibility :** When chemical degradation occurs after mixing true or more products , it is called chemical incompatibility e. g. oxidation ,reduction ,decomposition ,complexation .
- ❖ **Therapeutic Incompatibility :** When drugs are administered and show unwanted effect like antagonism ,synergistic or toxic effect , it is called therapeutic incompatibility.

Preventing Incompatibility of IV Admixture

- Preparing admixture under strict indications of Physician.
- Separating the drug dose by time and place and by rinsing the IV setup / system with a natural solution
- Proper mixing of drugs added in IV fluid.
- Reducing the number of drugs in a single IV bag.
- Avoiding the administration of Admixture just after the mixing.
- Observing the running of IV fluid to detect the physical change.

Role of Pharmacist in IV admixture Administration

- ✓ Pharmacist should provide proper supervision during preparation of IV admixture
- ✓ He should provide proper guidance for staff to avoid incompatibility.
- ✓ He should use latest research information to avoid incompatibility.
- ✓ He should use colour coding to avoid incompatibility
- ✓ He should provide labelling on bags

Total Parental Nutrition (TPN)

- → A method of providing nutrients to a patient through intravenous means, rather than through the gastrointestinal tract
- → This method is used when someone unable to take nutrients orally . or in an emergency condition .
- → Examples of patients who may receive TPN include critically ill patients, burn victims, or patients recovering from surgery.
- → Total parenteral nutrition (TPN) is a method of delivering nutrients directly into the bloodstream via a vein. It is used when a patient is unable to consume food or absorb nutrients through the gastrointestinal tract due to a medical condition or surgical procedure. TPN solutions are typically made up of a combination of glucose, amino acids, lipids, vitamins, and minerals.

Types of TPN

- ➢ **Central Parental Nutrition (CPN) :** In this method fluids are delivered through a central vein ., Mainly through the superior vena cava , It is present beneath the collarbone and directly goes to the heart .
- ➢ **Peripheral Parental Nutrition (PPN) :** In this method fluids are delivered through a smaller vein .

Composition of TPN

→ TPN is a mixture of all the essential nutritional components , which are required for normal body functions like carbohydrates , proteins , fat and minerals .

Macronutrients provided by TPN

- Proteins
- Calories (carbohydrates)
- Fat

Micronutrients provided by TPN

- Vitamins
- Minerals

Indications of TPN

- TPN is administered if the digestive system is not working properly .
- If GIT needs a complete rest .
- Abdominal surgery
- Chemotherapy
- Intestinal Ischemia
- GIT bleeding
- Extremely Premature Birth

Complication of TPN

- Bacterial Infection Through the IV Catheter .
- Blood Clots can form at catheter .
- GI atrophy (weakening of GI) after 2 weeks .
- Liver disease can be develop after long term use of TPN .
- Gallbladder problems

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