A REVIEW ARTICLE ON THE ORAL DOSAGE FORM: TABLETS

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ABSTRACT

The most popular and easiest way to administered the drug by patients is tablets. They become popular because they were easy in preparation as compared to any other type of dosage form. The pharmacist prescribes the right drug to their patient which is based on the quality and availability of drug in the market. There are different brands of the same drugs in the market.

KEYWORD: Tablets, Capsules, Solid unit dosage, Active pharmaceutical ingredient API, Excipients.

INTRODUCTION

Tablet is the unit dosage form in which one dose of the drug is accurately placed.

We can say that “Tablets are solid dosage form generally prepared with addition of suitable pharmaceutical excepients.

Tablet are said to be most widely used conventional dosage forms because of its varieties of advantages.

Tablets are differ in size, shape, weight, hardness, thickness, disintegration, and dissolution characteristics.

They may also greatly differ in size and weight depending on the amount of drugs substance present and method of drug administration.

ADVANTAGE

High stability and low cost.

Easy to carry and transport.

Suitable to large scale production.
Self administration is possible.
Special release profiles are possible.
Accurate dose is possible.
It is tamper proof.

DISADVANTAGE
Some drugs are difficult to compress.
Drugs with bitter taste, odour and sensitive to oxygen or moist.
Drugs with slow dissolution or causing irritation in the GI cannot be made as a tablet.
Drugs with poor wetting properties can’t be formulated as a tablet.

TYPES OF TABLET

- Tablet for oral administration

1. **Compressed tablet**- These are uncoated and made by compression of granules.
2. **Sugar coated tablet**- These are smooth, oral compressed tablet containing sugar coating which provides both protection and sweet taste.

3. **Film coated tablet**- These are compressed tablet which are covered with a thin layer of polymeric substance to protect it from mixture and to mask the taste of ingredients. It improves physicochemical stability of the drug and delays the rate of absorption. E.g. Augmentin.

4. **Chewable tablet**- These are large, hard tablet, difficult to swallow. These tablets are placed in the mouth, chewed and swallowed e.g. Talcid.

5. **Enteric coated**- These tablet is coated with the acid resistant substance that allow the drug to dissolve in the small intestine(basic) rather than stomach (acidic) e.g. Voltaren.

6. **Buccal tablets**- These are small, flat, oval tablet are placed in the pouch between the cheek and gum e.g. Sandopart.

7. **Sublingual tablets** – These tablets are placed under the tongue and allow to dissolve and absorbed. These tablets are absorbed quickly into the blood stream. These have 100% bioavailability e.g. Nitroglycerin.
8. **Effervescent tablet**- These contain sodium bicarbonate and an organic acid in addition to drug substance. These tablets are soluble and they are taken readily and absorbed rapidly. Before use they are dissolve in water **e.g. Acetylsalicylic acid**.

9. **Troches**- These tablets contain a drug substance in flavored base. These are allowed to dissolve in the mouth. They are commonly used for cold and sore throat **e.g. Chlorhexidine**.

10. **Slow release tablet**- These tablets are treated with special coating so that various portions of the drug will dissolve any different rates. These tablets are administered less frequently (usually once daily).

11. **Modified release tablets**- These tablets are more advanced version that delivers a drug with delay after its administration or for a prolonged period of time or to specific target in the body **e.g. Preductal**.

- **Tablets for vaginal administration**
  These tablets are intended for insertion into the vagina. These are readily soluble into blood stream **e.g. Metronidazole**.

- **Tablets for implantation(pellets)**
  A small tablet that is prepared for insertion under the skin by giving a small surgical cut into the skin which is stitched after the insertion of tablets. The tablet must be sterile one. Contraceptive tablets are formulated as implant.

- **Tablet component**- In addition to active pharmaceutical ingredients, tablets contain numbers of inert materials known as excipients. Different excipients are as-
  - **Diluents** - These are filler designed to make up the bulk of the tablet, when the dose of the drug is less, **E.g. Lactose** is most commonly used as it is inert, stable and show good release property.
  - **Binders**- These material are added in drug as liquid form during wet granulation to form granules and promote formation of tablet. **e.g. Starch paste** is the most common binder.
  - **Disintegrants**- These are added to increase the breaking of the tablet as it comes in contact with fluid in GIT. **e.g. SSG (sodium starch glycolate)**.
  - **Lubricant**- They are intended to prevent adhesion of the tablet materials to the surface of dies and punches, reduce inter particle friction and may improve the rate of flow of the tablet granulation.
✓ **Anti-adhering** - This stops the powder from sticking to the surface of equipment.

✓ **Glydant** - They improve the flow property of the tablet, granules, or powder.

✓ **Sweetening agents** - For chewable tablets: Sugar, mannitol. Saccharine is 500 times sweeter than sucrose.

✓ **Flavoring agents** - For chewable tablet: flavor oil are used.

**PROPERTIES OF TABLET**

- Adequate strength.
- Good physical and chemical stability.
- Provide intended drug release profile.
- Free from defects.

❖ **TABLET DEFECTS**

➢ **CAPPING** - It is a partial or complete separation of top or bottom crowns of a tablet from the main body of tablet.

Causes and Remedy Related to Formulation -

✓ **Causes**

- Large amount of fines in the granulation.
- Too dry or very low moisture content.

✓ **Remedy**

- Remove some or all fines through 100 to 200 mesh screen.
- Moisten the granules suitably. Add hygroscopic substance e.g.: sorbitol, methylcellulose.

Causes and remedy Related to Machine -

✓ **Causes**

- Incorrect adjustment of sweep-off blade.
- Poorly finished dies.

✓ **Remedy**

- Adjust sweep-off blade correctly to facilitate proper ejection.
- Polish dies properly. Investigate other steels or other materials.

➢ **LAMINATION**: Separation of tablet in two or more distinct layers.
Causes and remedy Related to Formulation-

✓ Causes
- Oily or waxy materials in granules.
- Too much of hydrophonic lubricant.

✓ Remedy
- Modify mixing process, Add adsorbent or absorbent.
- Use a less amount of lubricant or change the type of lubricant.

Causes and remedy Related to Machine-

✓ Causes
- Incorrect set up press.
- Rapid decompression

✓ Remedy
- Use tapered dies, i.e. upper part of the die bore has an outward taper of 3 to 5 degree.
- Use pre-compression step. Reduce turret speed and reduce the final compression pressure.

➢ PICKING:- Surface material of the tablet which is stick to the punch and which is removed by the picking.

Causes and remedy Related to the Formulation.
- Too little and improper lubricant.
- Too much amount of binder.

✓ Remedy
- Increase lubricant; use colloidal silica as a polishing agent, so that material does not cling to the punch faces.
- Reduce the amount of binder, change the type or use dry binders.

Causes and remedy Related to the Machine

✓ Causes
- Pressure applied is not enough; too soft tablets.
- Rough and scratched punch faces.
✓ Remedy
  ▪ Increase pressure to optimum.
  ▪ Polish face to high luster.

➢ STICKING:- It refers to tablet material adhering to the die wall.

Causes and remedy Related to the Formulation:
✓ Causes
  ▪ Oily and waxy material.
  ▪ Too soft and weak granules.

✓ Remedy
  ▪ Modify mixing process. Add an absorbent.
  ▪ Optimize the amount of binder and granulation technique.

Causes and remedy related to the Machine
✓ Causes
  ▪ Too little pressure.
  ▪ Compressing too fast.

✓ Remedy
  ▪ Increase pressure.
  ▪ Reduce speed.

➢ MOTTLING: It is an unequal distribution of colors on a tablet with light and dark areas on surface of tablet.

Causes and remedy Related to Formulation:
✓ Causes
  ▪ Improperly mixed dye, especially during “Direct Compression”.
  ▪ Use of drugs whose colour is different from tablet excipients.

✓ Remedy
  ▪ Mix properly and reduced size if it is of a larger size to prevent segregation.
  ▪ Use of appropriate colourants.

➢ Weight variation- Variation in weight of tablet beyond the limit.
Causes- Poor mixing and Punch variation.
Remedy- Use of vibrater attached to the hopper.

- **Double impression**- Faulty engraving by punches with monogram or engraving.

Causes- Slight rotation of punch after precompression.
Remedy- Using non-rotating cam track.

**DISCUSSION**

There are many tablets in the pharmaceutical market which are determined with various brand names and are formulated with the standard procedure and API content.

- Coated tablets include enteric coated aspirin, enteric coated declofenac etc.
- Uncoated tablet include aspirin 400 mg paracetamol 500mg, acetazolamide 250 mg, cetirizine B.P 10mg, etc.
- The Tablet are evaluated based on the biological types, API and nature of tablets.
- Effervescent tablets include Ranitidine, Acorbic acid etc.

**CONCLUSION**

Tablets are the most common and frequently used solid dosage forms. This is because of its low cost and it can be easily administered. Defects in the tablets arises during manufacturing processes, storage and transport. This visual defect can reduce the effectiveness of the product. In this review, types of tablets, excipients, defects, causes and remedy to overcome these defects have been discussed. The focus of this discussion was to establish way to overcome these common defects and to identify the cause of each defects and finally resolve the defect before it reaches the tablet press.

**REFERENCE**


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