IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 2, October 2024

A Review Paper on Coating Tablet

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Abstract: *Pharmaceutical technology is used to cover an API tablet or granule with a thin polymer-based film. Its advantage is that it masks the taste, smell, and color of the medicine. It produces protection for the medication's gastrointestinal tract, chemical, and physical environments. Coating has a significant impact on drug release, shelf life, and bioavailability in pharmaceutical dosage forms. Tablet coating can be done in a number of ways, such as enteric coating, film coating, and sugar coating. The efficiency of the oral dose form depends critically on the coating thickness on a tablet's surface. Overcoming the drawbacks of solvent-based coating is the focus of current developments in tablet coating. This review addresses the coating procedure, tools used, assessment of coated tablets, and specific coating methods.*

Keywords: Pharmaceutical solid dosage, coated tablets, Sugar Coating

I. INTRODUCTION

A tablet is a type of medication dosage form. The active ingredient in the tablet is made up of a number of different excipients, most of which are powders that have been crushed into a solid dosage form.The process of coating involves applying a layer of coating material to the surface of a dosage form in order to provide a number of advantages, the primary ones being improved medication release from the dosage form and ease of product identification.[1] Tablets that have one or more layers of a mixture of different substances, such as plasticizer, Coating materials are typically applied as suspensions or solutions in environments where the vehicle evaporates.[2] A batch of tablets is coated with coating material in a tumbled coating pan, resulting in a sticky polymeric film covering the tablet surfaces. The tablet surface transitions during the procedure from a sticky liquid to a tacky semisolid and finally to a dry, non-stick surface.

OBJECTIVES OF TABLET COATING

The following are the goals of tablet coating:

- To disguise the medicine's disagreeable taste, color, or odor in order to increase patient compliance. To shield the medication from the environment and give it chemical and/or physical protection, improve stability.
- Extend the medication's shelf life
- Make it simpler to consume large dose forms.
- To delay the loss of volatile ingredients.
- In certain instances, the rate of drug release can be changed or regulated by using sustained-release, delayed-release, and repeat-action medications (enteric coated).
- The incompatibility of pharmaceuticals can be combined into a single dosage form. The dose form can be mechanically strengthened. Enhancing the drug's look and adding identifying colors to make it easier for consumers, pharmacists, and producers to identify it.[3,4]

II. HISTORY OF COATING TABLET

Eventually, the word "panning" was the sole one used to describe the process. The term "panning" is still widely used in the candy industry.Coating was traditionally done with a revolving drum on a work surface. As the pan rotated, a coating slurry was added, and the tablet mattress was covered with the substance. The main issue with this technology was how long it took for the coating process to dry. To solve the problem, let it dry evenly. Initially, a perforated pan was used to spray a thin membrane, which usually accounted for 1% to 3% of the tablet's total weight, when film coating initially gained popularity. By employing holes in the pan to enable heated or cooled handled air be sucked through it, much like in a clothes drier, the tablets were able to dry more quickly. This reduced the method's overall

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time. The ability to switch the film coating fluid from a solvent-based alternative to a water-based one arose with the development of walked toward drying. [5,6]

COATING PROCESS

Rotating coating pans are commonly used for coating. The uncoated tablets are placed in the pan, and as they fall, the liquid coating component is added to the pan. The solid coating material layer is left behind when air is blasted over the rotating tablets, causing the liquid coating material to evaporate. Usually, the coating procedure employs the following

STEPS

- Batch identification and selection of coating type.(A coating of sugar or film)
- Dispensing (dosing each raw material precisely as needed)
- Putting tablets into a pan.
- Preheating the tablets • Spraying (applying the coating material while simultaneously rolling the tablet)
- Dehydrated
- Diminishing
- Ejecting[7,8]

VARIOUS KINDS OF COATING TABLET:

- **Sugar coating:** Sugar coating was done to mask bitter taste of tablets. Bitter tablets are coated with sugar coat in order to mask the taste of tablet. It also provides good appearance to tablets. The process of sugar coating consists of several steps, which are as follows:
- **Sealing:** It gives the tablet a moisture barrier and solidifies it.[9]
- **Sub coating:** This process increases the weight of the tablet and rounds the edges.[3]
- **Smoothing/grossing:** This fills in the subcoating imperfections and makes the tablet larger to the predetermined dimension.
- **Coloring:** This provides the tablet with its final color.
- **Polishing:** This is done to achieve the appropriate sheen.[10]

Film Coating :

Due to its lengthy procedure, film coating technology has taken the place of the sugar coating method. To create a thin, consistent film on the tablet surface, a rotating tablet bed is sprayed with a polymer, pigment, and plasticizer solution.The selected polymer is mostly determined by the intended release rate or the intended site of medication release (intestine or stomach)[10]

Desired site categorizes it as two types:

Compression coating :

The Compression Coating It entails employing specifically made tableting equipment to condense granular materials around a prefabricated tablet core. The process of compression coating is dry. It offers benefits in some situations when the tablet core needs to be coated to mask taste or provide the product delayed or enteric qualities but cannot withstand organic solvents or water.[11]

Dip coating:

To apply coating, dunk tablets into coating liquid and then dry them in traditional coating pans. You can create the required coating by repeatedly alternating the dipping and drying stages.

Applying a Coating :

Coat is produced around a pre-formed core by compression. mostly used to separate materials that are chemically incompatible.

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Coating with enzymes

An enteric coating is a type of barrier that regulates where oral medication is absorbed in the digestive system. Since the word "enteric" refers to the small intestine, enteric coatings stop medication from releasing before it gets there. At low pH, the enteric coated polymers continue to unionize and remain insoluble. However, as the GIT's pH rises, the acidic functionalgroups that have the ability to ionize, causing the polymer to expand or dissolve in the intestinal fluid.

Enteric coating is required :

- To protect the stomach from the drug
- To protect the drug from the stomach
- To protect the acid liable drugs from the gastric fluid
- To forbid gastric distress or nausea due to irritation from a drug [12]

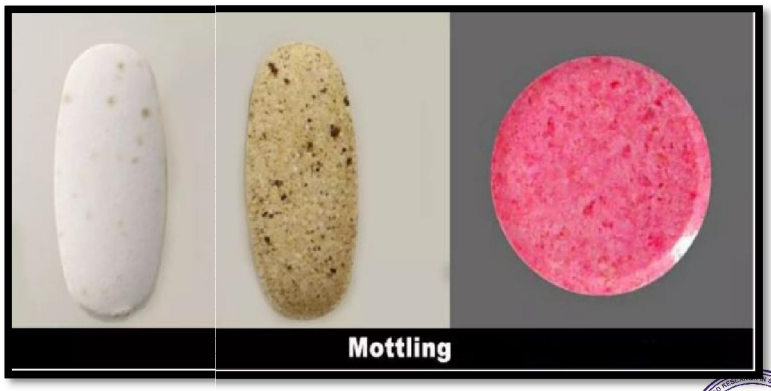
III. TABLET CAOTING DEFECTS

Picking and sticking:

This occurs when a fragment of the tablet is separated from the core by the coating. Tablets that are over-wet or have too much film tackiness adhere to one another and the coating pan. A small exposed region of the core may result from a piece of the film sticking to the pan or another tablet after it has dried, giving the tablet's surface a "picked" appearance.

Motteld Colour:

This may occur if the tablet cores are cold, the coating solution is not correctly prepared, the actual spray rate is different from the intended rate, or the drying rate is not within specification.



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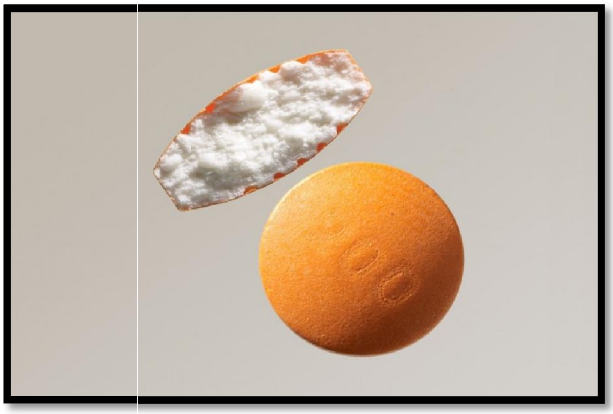
Dimmed color:

This could happen if the tablet cores are cold, if the coating solution is improperly made, if the spray rate is not as high as planned, or if the drying rate is not as high as required.



Erosin :

This can be the result of soft tablets, an over-wetted tablet surface, inadequate drying, lack of surface strength .[13,14]

CAPPING AND LAMINATION:

It is defined as when the lower or upper portion of the tablet separates horizontally i.e. either partially or completely from the main body of a tablet and comes off as a cap, during ejection of the tablet press or during subsequent handling. Separation of the tablet into two or more distinct layers is defined as lamination. It happens due to air entrapment during compression process or because of expansion of the tablet during ejection.[12]

Frosting and peeling

This flaw is characterized by a sheet-like separation of the coating from the tablet surface. Peeling is an indication that the coating solution was unable to adhere to the tablet's surface. This may be the result of an excessive wetness level, a flaw in the coating solution, or a high moisture content in the tablet core.

Chipping

Usually along the tablet's edges, the film chips in this situation.[15]

This may occur from a friable tablet core, excessive pan speed, or an inadequate plasticizer in the coating solution.

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Orange Peel

This is a texture of coating that has an orange-like appearance. This flaw occurs when the film chips and gets dented; this commonly happens around the tablet's edges.[9]

Blushing

This flaw occurs when the film chips and gets dented; this commonly happens around the tablet's edges of tablet .

Blooming

In this coating becomes dull immediately or after long time

IV. ADVANTAGES

- When compared to other oral dosage forms, tablets' wide variety of functions, low content variation, and higher dose precision make them stand out as unit dosage forms.
- They create the best packaging and strips for the least amount of money.
- Low price.
- Lighter and more portable.
- Maintaining the proper microbiological and chemical balance when taking medication orally
- Effective in production on a wide scale.
- Easy to swallow and with minimal hang-up potential.
- It is possible to conceal disagreeable tastes and smells using coating.
- Enteric coating enables a product to be introduced gradually.
- Simple to handle

V. DISADVANTAGES

- People who are unconscious or young children may have trouble swallowing
- Due to their low density and amorphous nature, several drugs are not easily compacted into dense compacts.
- When evaluating pharmaceuticals, it might be necessary to cover or encapsulate those that have strong smells, are sour, or are oxygen-sensitive.
- Capsules might be the best option in this situation.[16]

VI. CONCLUSION

Products with coatings are of higher grade. The coating is put on a dosage form that is already fully operational. The coating regulates the drug's bioavailability. A number of flaws could also appear during coating. These flaws have the potential to lower the product's efficacy and user acceptance. This review has covered coating kinds, faults, factors influencing different coating procedures, and coating benefits and drawbacks. There is a great deal of potential for advancements in tablet coating in the future to produce particular advantages.

ACKNOLEDGEMENT

The Honourable Principal Dr. Sanjay Ingle Sir Dharmaraj Shaikshanaik Pratishthan college of the pharmacy, walki, Ahilyanagr is greatly appreciated for granting us the opportunity to conduct the preview paper. We also introduce Miss. Priyanka Jadhav ma'am his leadership as well as assistance during study process.

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