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A REVIEW ON MOUTH DISSOLVING TABLET

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ABSTRACT

Over the past ten years, there has been an increase in demand for mouth dissolving tablets, especially among elderly, pediatric, and patients who have swallowing difficulties. Tablets that dissolve quickly in saliva without the need for liquid and disintegrate in the mouth are known as mouth-dissolving tablets.

For many medications, the oral route or dosage form is the most recommended method of administration; nevertheless, there are several limitations, such as first-pass metabolism, patients in psychiatric hospitals, bedridden patients, and patients who are recalcitrant.

FDT formulations contain superdisintegrants to increase the pace at which tablets dissolve in the oral cavity and are made to dissolve in saliva amazingly quickly – within a few seconds, less than 60 seconds Orodispersible, mouth-dissolving, orally disintegrating, and melt-in-mouth are other names for fast-dissolving pills.

KEYWORDS: *Super disintegrant, Fast Dissolving Tablet, Mouth Dissolving Tablet*

2) INTRODUCTION

Because of its precise dosage, low cost, self-medication, noninvasive approach, and convenience of administration, which results in a high degree of patient compliance, the oral route is still the recommended technique for administering therapeutic agents. Approximately 60% of well-known small-molecule pharmaceutical medicines that are sold commercially are taken orally. According to current estimates, oral formulations account for approximately 90% of the global market share of all pharmaceutical formulations meant for human consumption. Solid dosage forms are widely used due to their affordability, simplicity of use, precise dosage for self-medication, ability to prevent pain, and—above all—patient compliance. Tablets and capsules are the most often used solid dose forms. The mouth dissolving pill is something that The term "mouth dissolving tablets" refers to solid dosage forms that dissolve quickly in the oral cavity and dissolve into saliva, creating a solution that doesn't require water to administer. Many patient populations have trouble swallowing traditional dosage forms, including tablets, including the elderly, children, intellectually impaired, uncooperative, and nauseous. Conditions like a lack of water, allergic reactions, and coughing fits will make it more difficult to swallow traditional tablets.

Other names for the oral dissolving tablet include freeze-dried wafers, quick disintegrating tablet, rapid melting tablet, fast dispersion tablet, and rapid dissolve tablet.The most widely used dose forms are tablets and capsules. However, a significant disadvantage of these dose formulations is

1. Parkinson's disease
2. Motion sickness
3. Ignorance
4. Senior citizens
5. Kids
6. People with mental disabilities
7. The absence of water

Rapidly disintegrating and dissolving tablet dosage forms for oral administration can address these issues because they dissolve in saliva and don't require water to swallow. The primary strategy is to create mouth-solving or mouth-disintegrating tablets that dissolve quickly in saliva in a few seconds without the need for water due to the super-disintegrant in the formulations.

MECHANISM: A drug's bioavailability is dependent on its absorption, which is influenced by its permeability across the gastrointestinal membrane and its solubility in gastrointestinal fluid.

A drug's solubility is mostly determined by its physiochemical characteristics. Tablet disintegration has a significant impact on the rate of medication breakdown. When a tablet comes into contact with an aqueous fluid, it breaks up. This process of desegregating the constituent particles before the drug dissolves is called the disintegration process, and the excipients that cause this process are called disintegrants. Disintegrants are an essential part of the tablet formulation.

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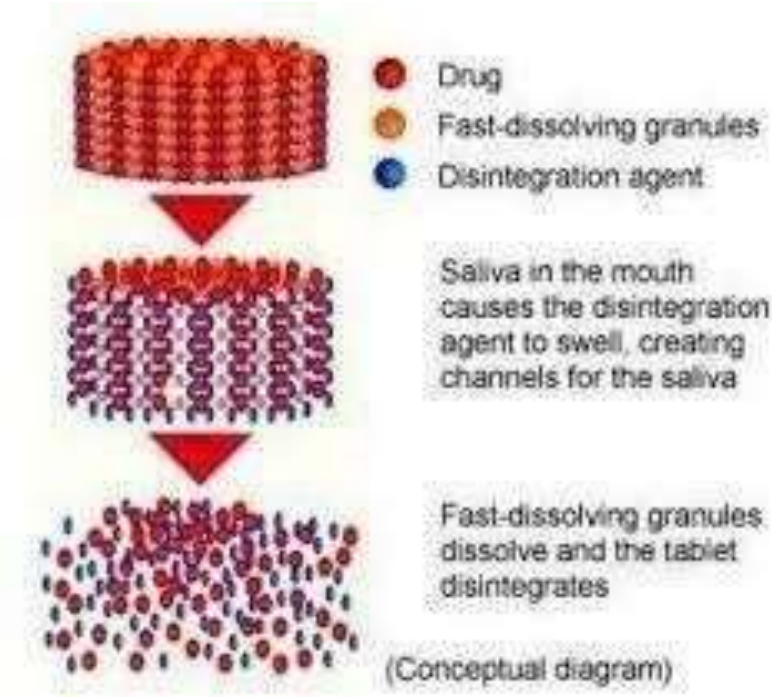


Fig No : 1 Disintegration Mechanism Of MDT

Characteristics of MDTs
• Simpleness of administration for patients—such as young children, elderly patients, and psychiatric patients—who refuse to take a tablet.
• Accurate dose and ease of administration in contrast to liquids.
• The dosage form dissolves and disintegrates quickly; it doesn't require water to swallow, which is a very practical feature for patients who are traveling and don't always have access to water.

MDT's ideal qualities include: * Having a pleasant mouthfeel;
* Not requiring water for oral administration.
* Possess a passable ability to hide flavor.
* Be less friable and tougher.
* After administration, leave little to no residue in the mouth.
* Show minimal susceptibility to external factors (temperature and humidity) *
Permit the production of tablets using standard processing and packaging machinery.

Benefits of MDT
Convenience: Patients find tablets convenient to use because they are portable and simple to administer.
Accurate Dosing: They make sure patients get the right amount of medication by giving them exact dosages.
Stability: Tablets are more stable and easier to store than liquid forms of medication since they typically have a longer shelf life. Taste Masking: A lot of tablets can be coated to cover off bad flavors, which increases patient adherence.
Production Ease: Compared to alternative dose forms like injections or liquids, making tablets is frequently simpler and less expensive.

3) GOAL AND PURPOSE

AIM: ANALYSIS OF MOUTH DISSOLVING TABLET GOALS

1. To Create a Novel MDT Formulation: Create and refine a formulation for mouth-dissolving tablets that guarantees quick dissolution and disintegration.
2. To Assess Patient Compliance: Determine whether MDTs can help various patient populations adhere to their prescription regimens.
3. To Increase Bioavailability: Examine how the MDT formulation affects the bioavailability of medications that are poorly soluble in comparison to traditional dose forms.
4. Geriatric and pediatric care: Simple administration for those who have trouble swallowing.
5. Better Stability and Taste Masking: Stable formulations and taste-masking agents were included in the design to enhance the patient experience.
6. Mouth-dispersing tablets dissolve or break down in saliva and can be eaten without water.

The following are the materials and excipients:
1) SUPERDISINTEGRANT: An excipient called a superdisintegrant is added to a tablet blend to help break up the compacted mass when it is placed in a fluid environment. To guarantee quick disintegration and high dissolution rates, it is crucial to choose the right superdisintegrant in the right concentration.

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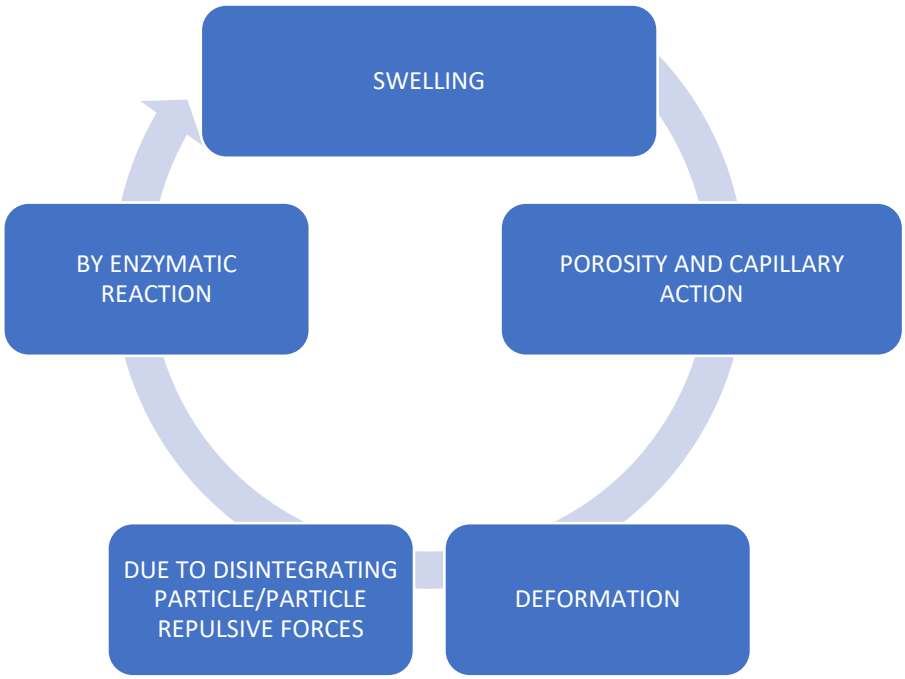


Fig Mechanism of Superdisintegrant

a. Natural Superdisintegrants: These substances are frequently employed in formulations for fast-dissolving tablets to facilitate the disintegration and disaggregation of tablets. Banana powder, apple pectin, plantago ovata mucilage, hibiscus rosa sinesis mucilage, gum karaya, fenugreek powder, and so on are examples of natural superdisintegrants.

b. Synthetic Superdisintegrants: These substances are most frequently utilized in the formulation of fast-dissolving tablets to facilitate the disintegration and disaggregation of the tablets. Sodium starch glycolate, crosspovidone, croscarmellose sodium, ion exchange resin, and others are examples of synthetic superdisintegrants.

- Swelling: Through this process, some disintegrating ingredients, such as starch, break down tablets by imparting a dissolving effect when they come into contact with water. For instance, Plantago ovata and sodium starch glycolate.
- By capillary action: The initial phase is always disintegration by capillary action. The tablet breaks into fine particles when it is placed in an appropriate aqueous medium because the medium seeps into the tablet and replaces the air that has been adsorbed on the particles, weakening the intermolecular connection.
- By enzymatic action: In this case, the body's natural enzymes serve as disintegrants. These enzymes aid in disintegration by destroying the binder's binding activity.
- Deformation: The starch grains undergo deformation when pressure is applied, and they return to their normal shape when the pressure is released. However, after they were compacted into tablets,

2) Emulsifying Agents Are

Emulsifying agents are crucial excipients in the formulation of fast-melting tablets because they facilitate the drug's quick disintegration and release without the need for chewing, swallowing, or water consumption. Additionally, adding emulsifying agents—such as propylene glycol esters, alkyl sulfates, and others—helps stabilize immiscible mixtures and improve bioavailability.

3) Lubricants: Although they are not necessary excipients, lubricants can help make these tablets more appealing once they dissolve in the mouth. Lubricants eliminate grit and support the process by which drugs pass from the mouth into the stomach. he two emulsifying agents are:

4) Sweeteners and flavors: Patients find the items more pleasant and agreeable when they contain flavors and taste-masking substances. The bitterness and unfavorable flavors of several active substances are lessened with the inclusion of these ingredients. E., clove oil, peppermint oil

5) Saliva stimulating agent To accelerate the rate of disintegration and breakdown in the oral cavity, some MDT formulations can make use of saliva stimulating chemicals.

6) Bulking material: When creating fast-melting tablets, bulking ingredients are important. The substance serves as a filler, diluent, and cost-cutting agent. In addition to lowering the concentration of the active ingredient in the composition, bulking agents improve the textural qualities, which in turn promote the disintegration in the mouth. For example, DCL, lactitol, polydextrose, and mannitol

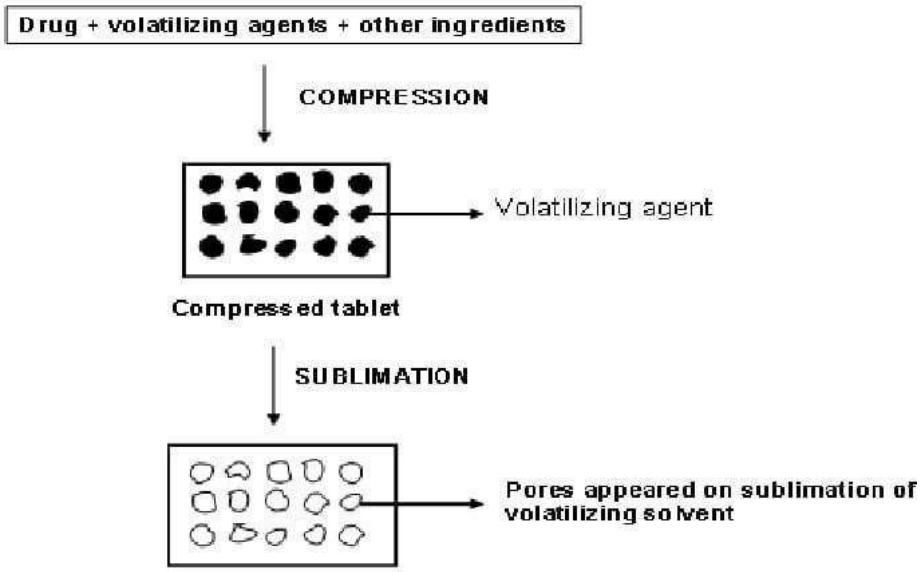
1) Direct Compression

The first method of preparation is direct compression, which is the most straightforward and economical way to make tablets. Using this process, tablets are made directly without any prior treatment by compressing the medication and additive mixture. The mixture that is going to be compressed needs to have good flow characteristics. This approach takes three stages to finish. i.e., a) grinding the medicine and additives

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b) combining the aforementioned Tablet compression (c)

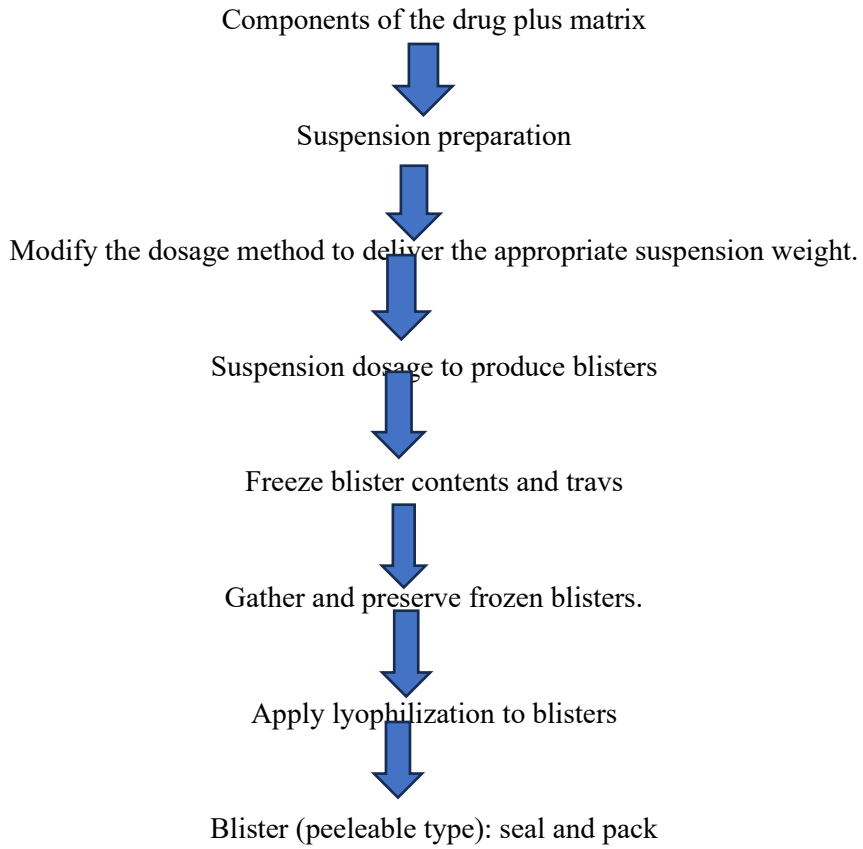
2) Sublimation



3) Spray Drying

Gelatin is utilized as a matrix and a supportive agent in the spray drying process. The superdisintegrants are crosspovidone, sodium starch glycolate, and crosscarmellose sodium. The purpose of mannitol is bulking. It has been observed that tablets made from spray-dried powder dissolve in an aqueous solution in less than 20 seconds.The formulation included sodium starch glycolate and crosscarmellose sodium as superdisintegrants, lactose and mannitol as bulking agents, and citric acid as an acidic component. Ultimately, the spray-dried powder was compacted into tablets, which demonstrated a rapid rate of dissolution and disintegration.

4) Technology for lyophilization and freeze drying



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5) The Tablet Molding Technique: The solvent method and the heat method are the two types of molding processes. In order to create wetted mass, the solvent method entails moistening the powder combination with a hydroalcoholic solvent and then compressing it under low pressure in mold plates. The solvent is subsequently eliminated by air drying. The resulting tablets have a porous structure that speeds up dissolving and are less compact than compacted tablets. In the heat molding technique, a suspension containing the medicine and agar sugar (such as lactose or mannitol) is prepared, then the suspension is poured into blister packing wells, allowed to solidify at room temperature to form jelly, and then dried under vacuum at 300 degrees Celsius. One major challenge is the mechanical robustness of tablets in their molded state. Agents that bind

LIST OF MARKETED MOUTH DISSOLVING TABLET

- Antipsycotic Agent :- Clozapine , Olanzapine
- Antiparkinsonism Agent :- Selegiline
- Antihypertensive Agent :- Valsartan, Nifedipine,
- Antiemetics Agent :- Ondansetron
- Antidiabetic Agent :- Glipizide , Rosiglitazone Maleate
- Antiulcer Agent :- Famotidine
- Antiasthmatic Agent :- Montelucast

4)FUTURE ASPECT

❖ Technological advancement :- 1) Nanotechnology:- Enhanced bioavailability and targeted delivery 2) Freeze drying:- Improved stability and shelf- life

❖ Growing demand :-

1) Geriatric population:- easy administration for elderly patient
2) Pediatric care:- convenient dosing for children
3) chronic condition:- MDT for diabetes, hypertension and asthma
4) Emerging markets:- increasing access to health care

5) CONCLUSION

Mouth dissolving tablets have potential advantages over conventional dosage forms, with their improved patient compliance, convenience, bioavailability and rapid onset of action had drawn the attention of many manufacturers over a decade. Mouth dissolving tablets formulations obtained by some of these technologies have sufficient mechanical strength. Quick disintegration or dissolution in the mouth without water. Mouth dissolving tablets are cost-effective with the addition of advantage to dysphasic patients as they disintegrate and dissolve in mouth within a few minutes and release active agents. The new technologies of manufacturing provide tablets with rapid onset of action, increased bioavailability, low side effects and better safety

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