



A LITERATURE REVIEW ON: FAST DISSOLVING TABLETS

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Abstract: Fast dissolving tablets emerge as one of the popular and widely accepted dosage forms, especially for pediatric patients because of incomplete development of the muscular and nervous system and a case of geriatric patients suffering from Parkinson's disorder or hand tremors. Few solid dosage forms like capsules and tablets are present days facing the problems like difficulty in swallowing (dysphagia), resulting in many incidences of non-compliance and making the therapy ineffective. Oral dosage form and oral route are the most preferred route of administration for various drugs have limitations like first-pass metabolism, psychiatric patients, bedridden and uncooperative patients. Moreover, the amount of drug that is subject to first pass metabolism is reduced as compared to standard tablets.

Keywords: Fast dissolving tablets, FDTs, Super disintegrants, Mouth dissolving tablets, MDTs

I. INTRODUCTION

Formulation of drugs into a presentable form is the basic requirement and need of today. The dosage form is a mean of drug delivery system, used for the application of the drug to a living body. For the development of a suitable dosage form a thorough study about the physicochemical principles that governs a specific formulation of a drug should be subjected. Fast dissolving drug delivery systems were first developed in the late 1970s as an alternative to conventional dosage forms for the pediatric and geriatric patient. These tablets are designed to dissolve or disintegrate rapidly in the saliva generally less than 60 seconds [5]. The bioavailability of some drugs may be increased due to absorption of drugs in oral cavity and also due to progastrin absorption of saliva containing dispersed drugs that pass down into the stomach. Moreover, the amount of drug that is subjected to first pass metabolism is reduced as compared to standard tablets.

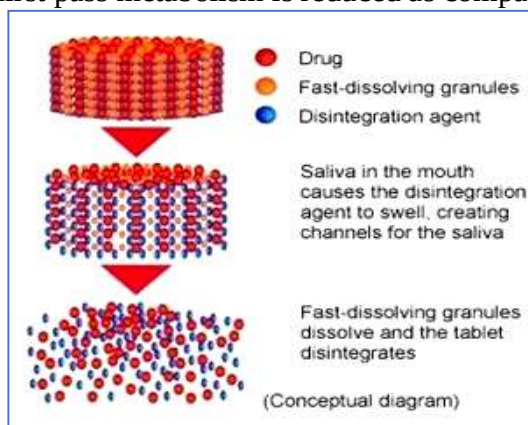


Fig 1. Conceptual diagram

Recent market studies indicate that more than half of the patient population prefers FDTs to other dosage forms. Mouth dissolving tablets are formulated mainly by two techniques first use of super disintegrants like Croscarmellose sodium, sodium starch glycolate and crospovidone. Another method is maximizing pore structure of the tablets by freeze drying and vacuum drying. In all methods, direct compression is preferred because of its effortlessness, quick procedure and cost-effectiveness.

2. REQUIREMENTS FDT's

a) Patient factors-

- Patients who have difficulty in swallowing or chewing solid dosage forms.
- Patients in compliance due to fear of choking.
- Very elderly patients of depression who may not be able to swallow the solid dosage forms
- An eight-year-old patient with allergies desires a more convenient dosage form than antihistamine syrup.
- A middle-aged patient undergoing radiation therapy for breast cancer may be too nauseous to swallow her H2-blocker.

b) Manufacturing & marketing-

As a drug nears the end of its patent life, it is common for pharmaceutical manufacturers to develop a given drug entity in a new and improved dosage form. A new dosage form allows a manufacturer to extend market exclusivity, unique product differentiation and extend patent protection.

c) Effectiveness factors-

Buccal, pharyngeal and gastric regions are all areas of absorption for many drugs. Any pre-gastric absorption avoids first pass metabolism and can be a great advantage in drugs that undergo hepatic metabolism. Furthermore, safety profiles may be improved for drugs that produce significant amounts of toxic metabolites mediated by first-pass liver metabolism and gastric metabolism, and for drugs that have a substantial fraction of absorption in the oral cavity and pre-gastric segments of GIT.

I. IDEAL PROPERTY OF FDTs

- Require no water for oral administration, yet dissolve /disperse/ disintegrate in mouth in a matter of seconds.
- Exhibit low sensitivity to environmental conditions (temperature and humidity).
- Allow the manufacture of tablet using conventional processing and packaging equipment's.
- Have a pleasing mouth feel.
- Have an acceptable taste masking property.
- Be harder and less friable.
- Leave minimal or no residue in mouth after administration.
- It should not require water for oral administration.

II. ADVANTAGES OF FDTs

- The risk of choking or suffocation during oral administration of conventional formulations due to physical obstruction is avoided, thus providing improved safety.

- The new business opportunity like product differentiation, product promotion, patent extension, and life cycle management become easy after the intervention of FDTs.
- Can be easily administered to pediatric, elderly and mentally disabled patients.
- First pass metabolism is reduced, thus offering improved bioavailability and thus reduced dose and side effects.

III. **DISADVANTAGES: -**

- Tablets may leave unpleasant taste and / or grittiness in mouth if not formulated properly.
- They are more susceptible to degradation by humidity and temperature.
- Fast dissolving tablet is hygroscopic in nature so must be kept in dry place.
- Drugs with larger doses are difficult to formulate into FDT e.g. Rifampin (600 mg), ethambutol (1000 mg).
- Drug with relatively large doses is difficult to formulate into FDTs.

IV. **LIMITATION**

- Dryness of the mouth due to decreased saliva production may not be good candidates for these tablet formulations.
- Rate of absorption from the saliva solution and overall bioavailability.
- Drug and dosage form stability.
- The tablets usually have insufficient mechanical strength. Hence, careful handling is required.
- The tablets may leave unpleasant taste and/or grittiness in mouth if not formulated properly.
- The major disadvantages of FDTs are related to the mechanical strength of tablets.

V. **SILENT FEATURES OF FDT AND FDDDS**

- Ability to provide advantages of liquid medication in the form of solid preparation.
- Pre-gastric absorption can result in improved bioavailability and as a result of reduced dosage, improved clinical performance through a reduction of unwanted effects.
- No need of water to swallow the dosage form, which is a highly convenient feature for patients who are travelling and do not have immediate access to water.
- Good mouth feel properly of FDDDS helps to change the basic view of medication as “bitter pill”, particularly for paediatric patients.
- Rapid dissolution of drug and absorption which may produce rapid onset of action.
- The risk of choking or suffocation during oral administration of conventional formulation due to physical obstruction is avoided, thus providing improved safety.

VI. **BENEFITS OF FDTs**

- Beneficial in cases such as motion sickness, severe episodes of allergic attack or coughing, where an ultra-rapid onset of action required.
- An increased bioavailability, particularly in cases of insoluble and hydrophobic drugs, due to rapid disintegration and dissolution of these tablets.
- Stability for longer duration of time, since the drug remains in solid dosage form till it is consumed. So, it combines advantage of solid dosage form in terms of stability and liquid dosage form in terms of bioavailability.
- Administered without water, anywhere, any time.

VII. **Criteria for excipient used in formulation of FDTs:-**

1. When selecting binder (a single or combination of binders) care must be taken in the final integrity and stability of the product.
2. The melting point of the excipients used should be in the range of 30-35 °C.
3. It should not interfere in the efficacy and organoleptic properties of the product.
4. The binder may be in liquid, semi-solid, solid or polymeric in nature.
5. Not require water to swallow, but it
6. should dissolve or disintegrate in the mouth in matter of seconds.

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