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Review Article

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REVIEW ON: FAST DISSOLVING TABLET

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ABSTRACT

Fast dissolving tablet is known as mouth dissolving tablets, orodispersible tablets , quick dissolving tablets .fast dissolving tablet are easy to administer and lead to better patient compliance .oral dosage form and oral route are the most preferred route of Administration for various drugs have limitations like uncooperative patients , first pass metabolism. Fast dissolving tablets are designed to dissolve in saliva within a few seconds. this novel drug delivery such as FDT or MDT have many disadvantages like dysphagia or non-accessibility of water while travelling and Advantage like pediatrics , geriatrics and patients have difficulty in swallowing tablets and capsules. Conventional preparation methods are sprays drying, freeze drying. Direct technologies have been developed for the production of orodispersible tablets.

KEYWORDS: Fast dissolving tablet, Sublimation, mouth dissolving tablets, superdisintegrants.

INTRODUCTION

Fast dissolving tablet disintegrants are placed on tongue and releases the drug dissolve .fast dissolving tablets are use in patients, like pediatric, geriatric or mentally disabled.[1] Fast dissolving drug delivery system was developed in the late 1970 s as an alternative to conventional dosage form for the padiatric and geriatric patient.[2] Tablet is a dosage form as of its accessibility in terms of self-Administration solidity and simplicity in development[3] tablets and capsules solid dosage form are most popular; one Important drawback of this solid dosage form for some patients is the difficult to swallow.[4] mouth dissolving tablets are formulated by two techniques such as super disintegrants like sodium starch and crosspovidone and another method is freeze drying and vacuum drying the bioavailability of drugs may be increased due to absorption of drugs in oral cavity and due to pre-gastric absorption of saliva containing dispersed drug that pass down in to the stomach.[5] fast dissolving system as a dosage form have the advantage of both solid and liquid dosage form.[6]

Advantages of Fast dissolving tablets[7,8]

1. First pass metabolism is reduced and improved bioavailability and reduce side effect.
2. FDTs are easily administered to pediatric and mentally disabled patients.[7]
3. No need to water swallows the tablet.
4. Requires no water intake.
5. Overcome unacceptable taste of the drugs.
6. Allows High drugs loading.
7. Accurate dosing as compared to liquids.

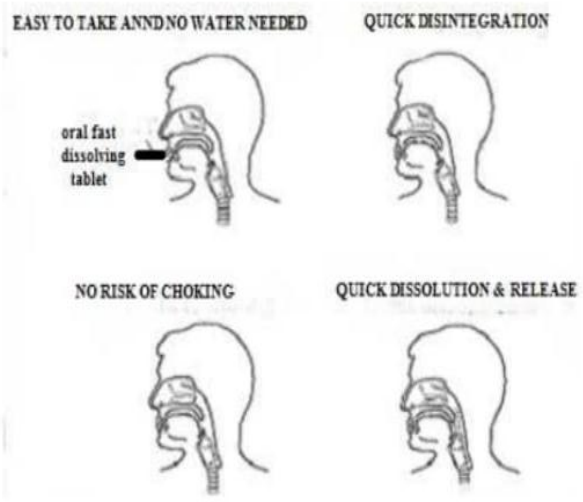

Fig. 1: Advantages of FDT [9]

Limitation of FDTs[10,11]

1. Dryness of the mouth due to decreased saliva production may not be good candidates for these tablet formulations.
2. Drug and dosage form stability.
3. Bad tastes drugs are difficult to formulate.
4. FDT are very porous and soft molded metrics.
5. Rate of absorption from the saliva solution and bioavailability.[7]

Salient features of fast dissolving tablets[10,12,13]

- Ease of Administration to the patient who cannot swallow, such as the elderly, stroke victims,

bedridden patients, a patient affected by renal failure and patient who refuse to swallow such as pediatric, geriatric and psychiatric patients.
- Rapid dissolution and absorption of the drug, which will produce the quick onset of action.
- Pre-gastric absorption can result I improved bioavailability and as a result of reduced dosage;
- New business opportunity like product Differentiation, product promotion, patent extensions and life cycle management.
- Some drugs are absorbed from the mouth, pharynx and esophagus as the saliva passes down into the stomach.
- An increased bioavailability, particularly in case of insoluble and hydrophobic drugs, due to rapid disintegration and dissolution of these tablets.
- Stability for a longer duration of time, since the drug remains in solid dosage form.
- Beneficial in cases such as coughing, motion sickness, allergic attack, where an ultra – rapid onset of action required.
- Allow high drug loading, Cost effective.

Drugs Eligible for Fast Dissolving Tablet's

The eligibility criteria for drugs to be formulated as Fast Dissolving Tablets are good stability, low dose, good mechanical strength,[9] and compatibility with excipients.[14,15]

Table 2:

Class of Drug	Drug
Anti-Malarial	Chlorquine , Amodiaquine
Anti-Bacterial Agents	Erythromycin, Doxycycline, Rifampin ,Tetracycline
Analgesic / Anti-inflammatory Agents	Ibuprofen,Picroxicam, Mefenamic Acid
Anti- Protozoal	Tinidazole, Benznidazole
Anti-Gout	Allopurinol, Probenecid
Anti-Thyroid	Carbimazole
Nutritional agents	Vitamin A, Vitamin B,
Oral Vaccine	Influenza , Hepatitis, Tuberculosis etc,
Anti- Hypersentive	Amlodipine, Nefidipine
Anti- Emetic	Ondansetrone, Dolasetron, Promethazine
Anti- Coagulants	Glipizide, Tolbutamide
Cardiac Inotropic Agents	Digitoxin, Digoxis
Gastro-Intestinal Agents	Ranitidine, Famotidine, omeprazole
Anti-Fungal	Griseofulvin, Miconazole

Techniques for preparing fast dissolving tablets

Many techniques have been reported for the formulation of fast dissolving tablets. These six major techniques which are widely used for the formulation of these tablets.[16, 17]

1) Freeze drying / Lyophilisation
2) Tablet moulding
3) Spray drying
4) Direct Compression
5) Sublimation
6) Mass extrusion.

1) Freeze drying / Lyophilisation

Freeze drying is the process in which water is sublimated from the product after it is frozen. This technique creates an amorphous porous structure that can dissolve rapidly. A typical procedure involved in the manufacturing of FDT using this technique is mentioned here.[18]

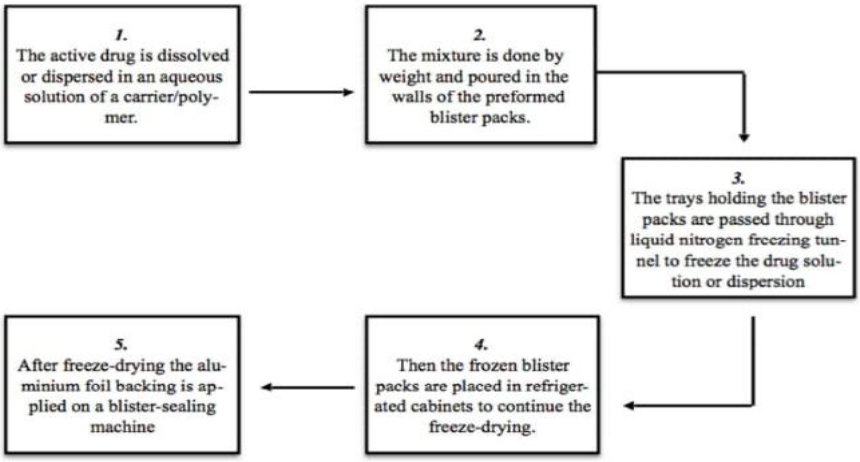

Fig. 3: Steps by step procedure of Lyophillisation of FDT.

2) Tablet Moulding

Molding process is of two Type's i.e solvent method and heat method. Solvent method involves moistening the powder blend with Hydro alcoholic solvents by compression at low pressures.[19]

The tablet manufacturing by solvent method are less compact than compressed tablets and posses a porous structure that hastens dissolution.[20] the Heat methods involves prepare a suspension that contain a drug ,agar and sugar (e.g mannitol or Lactose). And pouring the suspension in the blister packaging wells. Solidify the agar at the room to form a jelly and drying jelly at 30% under Vaccum.[19]

3) Spray Drying

In this technique, gelatin is used as a matrix, bulking agent like mannitol and sodium starch glycolate or crospovidone used as superdisintegrants. The tablet manufactured from the spray dried powder and this method gives rapid dissolution with 20 seconds in aqueous medium.[21]

4) Direct Compression

Direct compression represents most cost effective tablet manufacturing Techniques. This technique can how be utilized for preparation of FDT because of the availability of improved excipients especially superdisintegrants and sugar based excipients.[22]

MILLING → SIEVING → MIXING → COMPRESSION

Fig. 4: Process of direct compression.[23]

5) Sublimation

To generate a porous matrix, volatile ingredients are incorporated in the formulation to process sublimation highly volatile ingredients like naphthalene benzoic acid, ammonium bicarbonate, camphor; urethane may be compressed along with other excipients into a tablet. Sublimation process, this volatile material is then removed behind a highly porous matrix. These techniques have reported to usually disintegrate within 10-20 sec. solvents like cyclohexane and benzene can be used.[24]

6) Mass extrusion

In this technique are softened by water soluble ingredients i.e polyethylene glycol and methanol as solvent, passing through an extruder to form thin cyclinders. This method is these products can be used to bitter drugs and thereby achieve taste masking.[25]

Patented Technologies for Fast Dissolving Tablets

1) Zydis Technology

Zydis formulation is a unique freeze dried tablet in which drug is physically entrapped or dissolved within the matrix of fast dissolving carrier materials.when zydis units are put into the mouth then the freeze dried structure disintegrates rapidly and does not require water to aid swallowing the zydis matrix is composed of many materials designed to achieve a number of objectives.[26] To Impart strength and during handling , polymer such as alginates or dextran,gelatin are incorporated.[27]

2) Orasolv Technology

CIMA LAB has developed orasolv technology. In this system active medicament is taste masked. It also contains effervescent disintegrating agent. Tablets are made by direct compression technique at low compression force in order to minimize oral dissolution time. Tablet machine and conventional blender is used to produce the tablets. The tablets produced are soft and friable.[28,29]

3) Durasolv Technology

Durasolv is the patented technology of CIMA Labs. It is based on direct compression technology which uses suitable excipients with improved properties.[30] The tablet made by this technology consists of drug, fillers & lubricant. The tablets are prepared by using conventional tableting equipments. This technology is designed to provide stronger tablets without packaging precaution and these can be packed in blisters.[31]

4) Wow technology

Wow technology is patented by yamanouchi Pharmaceutical Corporation. wow means "without water". In this process low mold ability saccharides like glucose; mannitol and high mold ability saccharides like Oligosaccharide, mannitol is used to obtain a rapidly melting strong tablets.[32]

5) Flash dose technology

Flash dose technology is much like cotton candy and to produce crystalline floss structure. the drug can then be incorporated into this crystalline sugar and compressed into a tablet. Flash dose tablets consist of self binding shear form matrix formed as floss.[33]

6) Pharmabust technology

Pharmabust technology is being patented by SPI pharma. This Technology dry blending of drug, flavor and Lubricant followed by compression into tablets then dissolve within 30-40 seconds. Tablets have sufficient strength can be packed in blister packs and bottles.[34]

Marketed products of fast dissolving tablets

The products of FDT which are available in the market are given in the table no. 5 and 6.

Table 5: Fast dissolving tablets products available in Indian market.[4,35]

Brand (Trade) name	Active drug	Manufacture /Company
Acufix DT-TAB	Cefixime	Macleods, India
Alepam	Amoxycillin trihydrate	Scoshia Remedy, India
Acepod-o	Cefpodoxime	ABL Lifecare, India
Bigcef DT -TAB	Cefuroxime	Bestochem, India
Clonazepam ODT	Clonazepam	Par Pharmaceutical
Minoclav DT-TAB	Amoxycillin trihydrate	Minova life Science ,india
Mosid-MT	Mosapride citrate	Torrent Pharmaceutical,india
Numoxylin CV DT	Amoxycillin trihydrate	Gepach international ,india
Nulev	Hyoscyamine Sulfate	Schwarz Pharma ,India
Nimulid MDT	Nimesulide	Panacea Biotech ,New delhi,India
Romilast	Montelukast	Ranbaxy Labs Ltd., India
Rofaday MT	Rofecoxib	Lupin, India
Zyrof Meltab	Rofecoxib	Zydus, Candila, India
Torrox MT	Rofecoxib	Torrent Pharmaceutical, India
Kemstro	Baclofen	Schwarz Pharma,India
Valus	Valdecoxib	Glenmark India
Olanex Instab	Olanzapine	Ranbaxy Labs Ltd.,New Delhi,India

Table 6: Fast dissolving tablets products available in international market.[4,9]

Brand (Trade) name	Active Drug	Manufacturer / Company
Benadryl Fastmelt	Diphenhydramine	Warner Lambert , NY ,USA
Claritin redi Tab	Loratidine	Schering Plough Corp., USA
Domperon	Domperidon	Astra Pharma, Bangladesh
Febrectol	Paracetamo	Prographarm, France
Maxalt MLT	Rizatriptan	Merck and Co.,NJ ,U.S.A
Pepcid RPD	Famotidine	Merck and Co., NJ, U.S.A
Zelapar TM	Selegiline	Amarin Crop ., London , UK
Zoming –ZMT	Zolmitriptan	Astra Zeneca ,Wilmington , USA
Zofran ODT	Ondansetron	Glaxo Wellcome, Middlesex, UK

CONCLUSION

Fast dissolving tablets are innovative dosage forms and the problems encountered in Administration of drugs to the pediatric and eldrly patients. This dosage form and their route of administration results in enhanced bioavailability, rapid onset of action, better efficacy, and Improved patient Compliance. FDT s needs to be formulated for pediatric patients, geriatric bedridden, psychotic patients, for those patients who may not have access to water, patients who are busy in travelling. The formulation of fast dissolving tablets is to maximize the porous structure of the tablet matrix. These technologies is utilized for the formulation of the FDTs that provide more effective dosage form with more advantage and less disadvantages .FDTs may be developed for most of the available drugs in near future.

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