Review Article

Fast Dissolving Tablet – A Review

Gnanaprakash M[1*], Gomathi M[2], Jothimanivannan C[3], Vignesh M[4], Thinakaran P[5], Dinesh Kumar L[6]

[1,4,5,6]Students, SS Institute of Pharmacy, Sankari, Salem, Tamilnadu-637301, India.

[2]Department of Pharmaceutics, SS Institute of Pharmacy, Sankari, Salem, Tamilnadu-637301, India.

[3]Department of Pharmaceutical Chemistry, SS Institute of Pharmacy, Sankari, Salem, Tamilnadu-637301, India.

***Corresponding author's E-mail:** gnanamprakash1020@gmail.com

Received: 31-10-2022; **Revised:** 17-02-2023; **Accepted:** 23-02-2023; **Published on:** 15-03-2023.

ABSTRACT

Fast disintegrating tablets (FDTs) have received ever-increasing demand during the last decade, and the field has become a rapidly growing area in the pharmaceutical industry. Oral drug delivery remains the preferred route for administration of various drugs. Recent developments in the technology have prompted scientists to develop FDTs with improved patient compliance and convenience. Upon introduction into the mouth, these tablets dissolve or disintegrate in the mouth in the absence of additional water for easy administration of active pharmaceutical ingredients. The popularity and usefulness of the formulation resulted in development of several FDT technologies. FDTs are solid unit dosage forms, which disintegrate or dissolve rapidly in the mouth without chewing and water. FDTs or orally disintegrating tablets provide an advantage particularly for pediatric and geriatric populations who have difficulty in swallowing conventional tablets and capsules. This review describes various formulations and technologies developed to achieve fast dissolution/dispersion of tablets in the oral cavity. In particular, this review describes in detail FDT technologies based on lyophilization, molding, sublimation, and compaction, as well as approaches to enhancing the FDT properties, such as spray drying and use of disintegrants. In addition, taste-masking technologies, experimental measurements of disintegration times, and dissolution are also discussed.

Keywords: Fast dissolving tablets, polymers, disintegrating, marketed products.

QUICK RESPONSE CODE →

DOI: 10.47583/ijpsrr.2023.v79i01.002

DOI link: http://dx.doi.org/10.47583/ijpsrr.2023.v79i01.002

INTRODUCTION

Despite of tremendous advancements in drug delivery, the oral route remains the perfect route for the administration of therapeutic agents because of low cost of therapy, ease of administration, accurate dosage, self-medication, pain avoidance, versatility, leading to high levels of patient compliance. Tablets and capsules are the most popular dosage forms. But one important drawback of such dosage forms is 'Dysphagia' or difficulty in swallowing. This is seen to afflict nearly 35% of the general population. This disorder is also associated with a number of conditions like:

1. Parkinsonism
2. Motion sickness
3. Unconsciousness
4. Elderly patients
5. Children
6. Mentally disabled persons
7. Unavailability of water[1]

Recent advances in novel drug delivery system (NDDS) aim to enhance safety and toxicity of drug molecules by formulating a convenient dosage form for administration and to achieve better patient compliance. One such approach is formulation of orally disintegrating tablets; these are useful for pediatric, geriatric and also dysphagic patients, leading to improved patient compliance. This dosage form dissolves or disintegrates rapidly in the oral cavity within a matter of seconds without the needs of water. Tablet disintegration has been considered as the limiting step in faster drug release. Natural gums and mucilage have been widely explored as pharmaceutical industry as thickener, stabilizer, gelling agent, emulsifier, granulating agent, binder, suspending agent, film former, disintegrant and sustain release matrix. Demand for these natural sources is increasing and new sources are being developed. Natural gums and mucilages are preferred over semi synthetic and synthetic excipients in the field of drug delivery because they are cheap and easily available, having soothing action and non-irritant in nature. Further, they are eco-friendly, capable of multitude of chemical modifications, tentially degradable and compatible due to their natural origin.[2]

Mouth dissolving tablets are also known as orodispersible tablets, fast disintegrating tablets, orally disintegrating tablets, quick disintegrating tablets, fast dissolving tablets, rapid dissolving tablets, porous tablets, quick melt tablets and rapid melt tablets.[3]

Mouth Dissolving Tablet (MDT):

It is a tablet that disintegrates and dissolves rapidly in the saliva, within a few seconds without the need of drinking water or chewing. Most of the MDTs include certain super disintegrants and taste masking agents.

There are very a smaller number of patients who have suffered from 'Dysphagia' and they may behave some disorders like – Parkinson, motion sickness. Mouth dissolving tablets are designed in such a way that it does not require any water or fluid for the intake. It dissolves in the saliva within 60 seconds. Pediatric, geriatric, bedridden patients and busy patients, people who are traveling and don't have the facility to carry the water got benefit from this kind of dosage form.[4]

Ideal property of Fast dissolving tablets

A mouth dissolving Tablet should possess following characteristics,

1. It should not require water for oral administration.
2. It should be incentive to environmental conditions such as humidity and temperature.
3. It should not leave any residue in the mouth after disintegration.
4. It should have sufficient hardness to withstand the rigors during manufacturing processes and post manufacturing handling.
5. It should be adaptable to current processing and packaging machinery.
6. It should allow high drug loading.
7. It should have pleasant mouth feel.
8. It should be cost effective[5]

Advantages

- The risk of chocking 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.
- The FDTs are often formulated for existing drugs with an intention to extend the patent life of the drug through product differentiation[6]
- No need of water to swallow the tablet.
- Accurate dosing as compared to liquids.
- Dissolution and absorption of drug is fast, offering rapid onset of action.
- Beneficial in cases such as motion sickness, episodes of allergic attack or coughing, where an ultra rapid onset of action is required.
- Bioavailability of drugs is increased as some drugs are absorbed from mouth, pharynx and esophagus through saliva passing down into the stomach.
- Advantages over liquid medication in terms of administration as well as.
- Offering improved safety.
- First pass metabolism is reduced, thus offering improved bioavailability and thus reduced dose and side effects.
- Can be easily administered to pediatric, elderly and mentally disabled patients.[7]

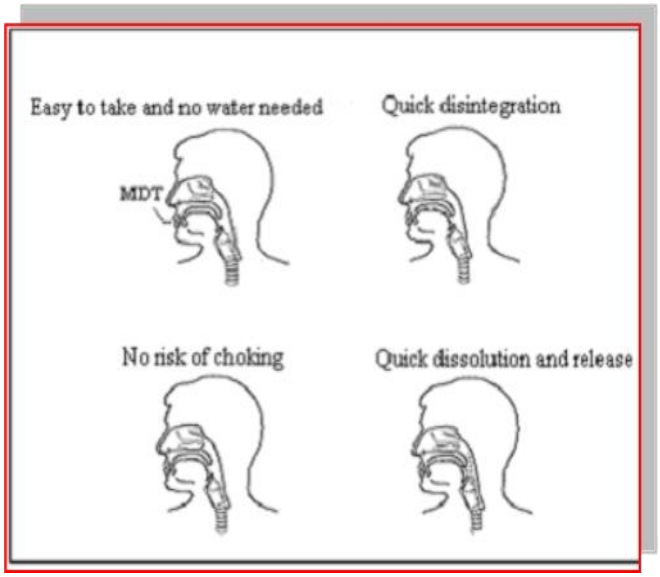

Figure 1: Advantages of MDT

Disadvantages

1. Drug with relatively large doses are difficult to formulate into FDTs.
2. Patients who concurrently take anti-cholinergic medications may not be the best candidate for FDTs.
3. Tablets usually have insufficient mechanical strength. Hence, it requires careful packaging and handling.
4. Tablets may leave unpleasant taste and / or grittiness in mouth if not formulated properly.
5. They are more susceptible to degradation by humidity and temperature.
6. Fast dissolving tablet is hygroscopic in nature so must be keep in dry place.
7. Drugs with larger doses are difficult to formulate into FDT

eg. Rifampin (600 mg), ethambutol (1000 mg).[8]

Drug Used in Fast Dissolving Drug Delivery System:

Examples: some of drug candidates best for FDTs,

- **Analgesic Andante-Inflammatory Agents:** Mefenamic acid, Ibuprofen, Proxicam.
- **Anti-Bacterial Agents:** Erythromycin, Tetracycline, Doxycycline, and Rifambicin.
- **Anti-Fungal Agents:** Griseofulvin, Miconazole.
- **Anti-Malarial Agents:** Chlorquine, Amodiaquine.
- **Anti-Gout Agents:** Allopurinol, Probenecid.
- **Anti-Hypertensive Agents:** Amlodipine, Nefidipine.
- **Anti-Coagulant Agents:** Tolbutamide, Glipizide.
- **Anti-Protozoal Agents:** Benznidazole, Tinidazole.
- **Anti-Thyroid Agent:** Carbimazole.
- **Cardiac Inotropic Agents:** Digitoxin, Digoxins.
- **Gastro Intestinal Agents:** Omeprazole, Ranitidine, Fomatidine.
- **Nutritional Agents:** Vitamin A, Vitamin B, Vitamin D, etc.
- **Oral Vaccines:** Influenza, Hepatitis, Polio, Tuberculosis, etc. **Main ingredients used in preparation of Fast dissolving tablets**

Important ingredients that are used in the formulation of FDTs should allow quick release of the drug, resulting in faster dissolution. This includes both the actives and the excipients. Disintegration and solubilization of a directly compressed tablet depend on single or combined effects of disintegrants, water-soluble excipients and effervescent agents.

The most important ingredients of a mouth dissolving tablets are

i. Super disintegrants

Use of disintegrants is the basic approach in development of MDTs. Disintegrants play a major role in the disintegration and dissolution of MDT. It is essential to choose a suitable disintegrant, in an optimum concentration so as to ensure quick disintegration and high dissolution rates. Super disintegrants provide quick disintegration due to combined effect of swelling and water absorption by the formulation. Due to swelling of superdisintegrants, the wetted surface of the carrier increases, this promotes the wettability, dispersibility of the system, thus enhancing the disintegration and dissolution. The optimum concentration of the super disintegrants can be selected according to critical concentration of disintegrant.

Below this concentration, the tablet disintegration time is inversely proportional to the concentration of the superdisintegrants, whereas if concentration of superdisintegrants is above critical concentration, the disintegration time remains almost constant or even increases. Sodium starch glycolate, Ac-di-sol (Croscarmellose sodium), Crospovidone, Microcrystalline cellulose, Pregelatinised starch are some of examples of disintegrants.

Mechanism of action of disintegrants

The tablet breaks to primary particles by one or more of the mechanisms listed below,

a. By capillary action
b. By swelling
c. Because of heat of wetting
d. Due to release of gases
e. By enzymatic action
f. Due to disintegrating particle/particle repulsive forces
g. Due to deformation.

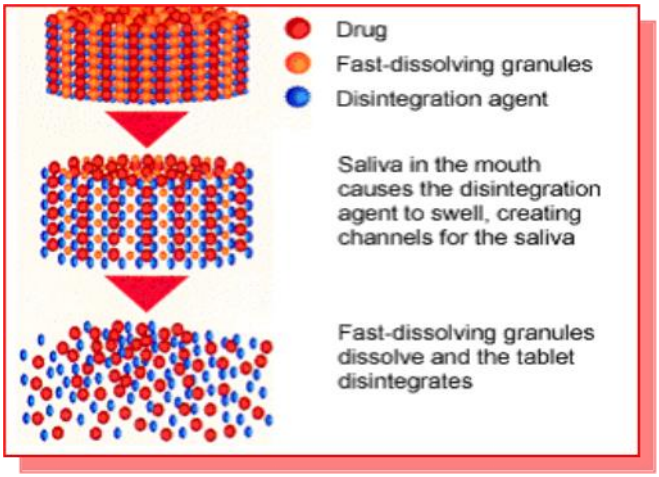

Figure 2: Mechanism action of Superdisintegrants

a. By capillary action

Disintegration by capillary action is always the first step. When we put the tablet into suitable aqueous medium, the medium penetrates into the tablet and replaces the air adsorbed on the particles, which weakens the intermolecular bond and breaks the tablet into fine particles. Water uptake by tablet depends upon hydrophilicity of the drug /excipient and on tableting conditions.

b. By swelling

Perhaps the most widely accepted general mechanism of action for tablet disintegration is swelling. Tablets with high porosity show poor disintegration due to lack of adequate swelling force. On the other hand, sufficient swelling force is exerted in the tablet with low porosity. It is worthwhile to note that if the packing fraction is very high, fluid is unable to penetrate in the tablet and disintegration is again slows down.

c. Because of Heat of Wetting (Air Expansion)

When disintegrants with exothermic properties gets wetted, localized stress is generated due to capillary air expansion, which helps in disintegration of tablet. This explanation, however, is limited to only a few types of disintegrants and cannot describe the action of most modern disintegrating agents.

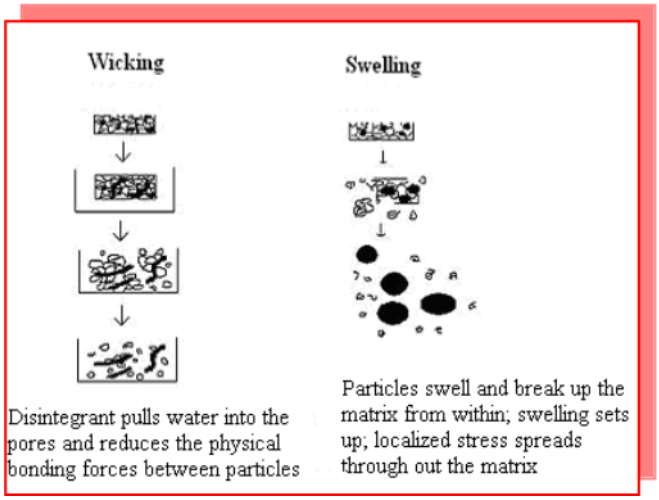

Figure 2: Disintegration of tablet by wicking and swelling.

d. Due to Release of Gases

Carbon dioxide released within tablets on wetting due to interaction between bicarbonate and carbonate with citric acid or tartaric acid. The tablet disintegrates due to generation of pressure within the tablet. This effervescent mixture is used when pharmacist needs to formulate very rapidly dissolving tablets or fast disintegrating tablet. As these disintegrants are highly sensitive to small changes in humidity level and temperature, strict control of environment is required during manufacturing of the tablets. The effervescent blend is either added immediately prior to compression or can be added in to two separate fraction of formulation.

e. By enzymatic reaction

Here, enzymes present in the body act as disintegrants. These enzymes destroy the binding action of binder and helps in disintegration. Actually, due to swelling, pressure exerted in the outer direction or radial direction, it causes tablet to burst or the accelerated absorption of water leading to an enormous increase in the volume of granules to promote disintegration.

f. Due to Disintegrating particle/particle repulsive forces

Another mechanism of disintegration attempts to explain the swelling of tablet made with 'non-swellable' disintegrants. Guyot-Hermann has proposed a particle repulsion theory based on the observation that non-swelling particle also cause disintegration of tablets. The electric repulsive forces between particles are the mechanism of disintegration and water is required for it. Researchers found that repulsion is secondary to wicking.

g. Due to deformation

Hess had proved that during tablet compression, disintegrated particles get deformed and these deformed particles get into their normal structure when they come in contact with aqueous media or water. Occasionally, the swelling capacity of starch was improved when granules were extensively deformed during compression. This increase in size of the deformed particles produces a breakup of the tablet. This may be a mechanism of starch and has only recently begun to be studied.

ii. Sugar based excipients

Sugar based excipients are used for taste masking and as bulking agents. Most of the drugs are having unpleasant or bitter taste. And the basic requirement for designing MDTs is that the drug should not have disagreeable taste. So taste masking is necessary in most of the cases. Sorbitol, mannitol, xylitol, dextrose, fructose, etc. are mainly used. Aqueous solubility and sweetness impart a pleasing mouth feel and good taste masking. But not all sugar-based materials have fast dissolution rate and good compressibility or compatibility. However, technologies have been developed to make use of the sugarbased excipients in the design of fast dissolving tablets. Other ingredients commonly used are water soluble diluents, lubricants, antistatic agents, plasticizers, binders, colors and flavors.

Binders

Proper selection of binder or combination of binders is essential to maintain integrity and stability of the tablet and to achieve desired sensory and melting point. Binding agents may be liquid, semi-solid and solid or mixture of varying molecular weights.

eg. polyethylene glycol, cocoa butter, hydrogenated vegetable oils.

Bulking Agents

It improves the textural characteristic it helps to enhances disintegration in mouth. Recommended bulking agents for this delivery system should be more sugar-based such as mannitol, poly dextrose, lactitol and starch hydrolysate for higher aqueous solubility and sensory perception. This agent is added in the range of 10 % to about 90 % by weight of the final composition.

eg. calcium carbonate, calcium phosphate, calcium sulfate, magnesium carbonate, magnesium trisilicate, pre-gelatinized starch and aluminium hydroxide.

Lubricants

It makes tablets palatable and provides quicker disintegration. It removes grittiness and assists in drug transport mechanism from mouth to stomach.

eg. stearic acid, magnesium stearate, calcium stearate, zinc stearate, talc, polyethylene glycol, liquid paraffin, magnesium lauryl sulfate and colloidal silicon dioxide.

Flavors & Sweeteners

Flavors and taste masking agents make the product more palatable and pleasing for patient. Addition of this ingredients to overcome bitterness and undesirable tastes of some active ingredients. Both natural and synthetic flavors can be used to improve the organoleptic characters of fast melting tablets

eg. peppermint oil, clove oil, bay oil, anise oil, eucalyptus oil, thyme oil, oils of bitter almonds, vanilla, citrus oils and fruit essences.

eg. sugar, dextrose and fructose, as well as non-nutritive sweeteners such as aspartame, sugar alcohols and sucralose.

Various Approaches for preparation of MDT

1. Freeze-drying or lyophilization
2. Sublimation
3. Spray drying
4. Moulding
5. Mass extrusion
6. Direct compression

1. Freeze drying:

The tablets prepared by freeze-drying or lyophilization are very porous in nature and disintegrate or dissolve rapidly when come in contact with saliva. In this process, water is sublimated from the product after freezing. First of all, the material is frozen to bring it below its eutectic point. Then primary drying is carried out to reduce the moisture to around 4% w/w of dry product. Finally, secondary drying is done to reduce the bound moisture to the required volume. Due to lyophilization, bulking agent and sometimes drug acquire glossy amorphous structure and thus dissolution is enhanced. A tablet that rapidly disintegrates in aqueous solution includes a partially collapsed matrix network that has been vacuum dried above the collapsed temperature of the matrix. The matrix is partially dried below the equilibrium freezing point of the matrix. Vacuum drying the tablet above its collapse temperature, instead of freeze drying below its collapse temperature provides a process for producing tablets with enhanced structural integrity, while rapidly disintegrating in normal amounts of saliva. However, the use of freeze-drying is limited due to high cost of equipment and processing. Other major disadvantages of the final dosage forms include lack of physical resistance in standard blister packs.

2. Sublimation:

This process involves addition of some inert volatile substances like urea, urethane, naphthalene, camphor, etc. To other excipients and the compression of blend into tablet. Removal of volatile material by sublimation creates pores in tablet structure, due to which tablet dissolves when comes in contact with saliva. Additionally, several solvents like cyclohexane, benzene etc. can also be used as pore forming agents. Mouth dissolving tablets with highly porous structure and good mechanical strength have been developed by this method.

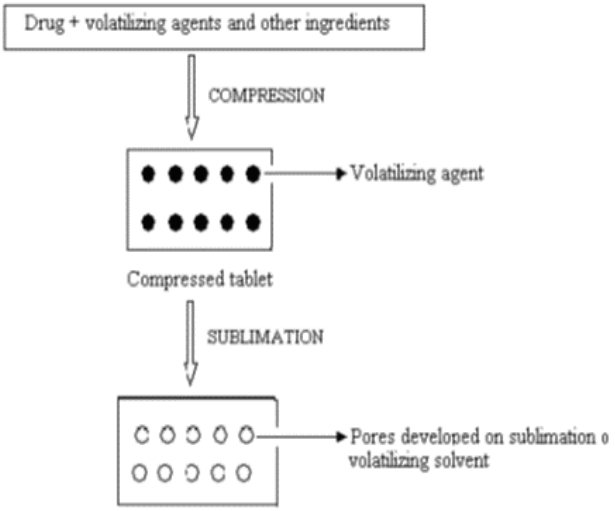

Fig: Schematic Diagram of Sublimation Technique for Preparation of MDT

3. Spray drying:

A highly porous and fine powder is prepared by spray drying an aqueous composition containing support matrix and other components. This is then mixed with active ingredient and compressed into tablet. Allen and Wang used this technique to prepare mouth-dissolving tablets, which disintegrated within 20 s.

4. Moulding:

Tablets prepared by this method are solid dispersions. Physical form of drug in the tablets depends on whether and to what extent it dissolves in the wetted mass. The drug can exist as discrete particles or micro particles in the matrix. It can dissolve totally to form a solid solution or dissolve partially in the molten carrier and remaining, if any, stays undissolved and dispersed in the matrix. Disintegration time, drug dissolution rate and mouth feel will depend on the type of dispersion. Different moulding techniques can be used to prepare mouth-dissolving tablets:

a. Compression Moulding:

The powder mixture previously wetted with a solvent like ethanol/water is compressed into Mould plates to form a wetted mass.

b. Heat Moulding:

A molten matrix in which drug is dissolved or dispersed can be directly Moulded into Mouth dissolving tablets.

c. No vacuum lyophilization:

This process involves evaporation of solvent from a drug solution or suspension at a standard pressure. Moulded tablets possess porous structure, which facilitates rapid disintegration and easy dissolution. Moulded tablets offer

improved taste due to water-soluble sugars present in dispersion matrix. But Moulded tablets lack good mechanical strength and can undergo breakage or erosion during handling and opening of blister packs. However, adding sucrose, acacia or polyvinyl pyrrolidone can increase mechanical strength.

5. Mass extrusion:

In this technique, a blend of active drug and other ingredients is softened using solvent mixture of water soluble polyethylene glycol, using methanol and then the softened mass is extruded through the extruder or syringe to get a cylinder of product, which is finally cut into even segments with the help of heated blades to get tablets. The dried cylinder can be used to coat the granules of bitter tasting drugs and thereby masking their bitter taste.

5. Direct compression:

The disintegrant addition technology (direct compression) is the most preferred technique to manufacture the tablets due to certain advantages

a. High doses can be accommodated.

b. Easiest way to manufacture the tablets.

c. Conventional equipment and commonly available excipients are used.

d. A limited no. of processing steps are involved.

e. Cost-effectiveness.

Tablet size and hardness strongly affect the disintegrant efficacy. Hard and large tablets have more disintegration time than normally required. Very soft and small tablets have low mechanical strength. So, an optimum kind and concentration of disintegrants should be chosen to achieve quick disintegration and high dissolution rates. Above the critical concentration level, however, disintegration time remains approximately constant or even increases.[9]

Patented Technologies for preparation of MDT

Zydis technology:

'Zydis' is the first mouth dissolving dosage form in the market. It is a unique freeze-dried tablet in which the active drug is incorporated in a water-soluble matrix, which is then transformed into blister pockets and freeze dried to remove water by sublimation. Zydis matrix is made up of a number of ingredients in order to obtain different objectives. Polymers such as gelatin, dextran or alginates are added to impart strength during handling. These form a glossy and amorphous structure. Mannitol or sorbitol is added to impart crystallinity, elegance and hardness. Various gums may be added to prevent sedimentation of dispersed drug particles. Water is used as a medium to ensure the formation of a porous dosage form. Collapse protectants like glycine may be used to prevent shrinkage of dosage form during freeze drying and long term storage.36 if necessary, suspending agents and pH adjusting agents may be used. Preservatives may also be added to prevent microbial growth. Zydis products are packed in blister packs to protect the formulation from environmental moisture. A secondary moisture proof foil punch is often required as this dosage form is very moisture sensitive. When put into the mouth, Zydis unit quickly disintegrates and dissolves in saliva.

Drawbacks:

- A water insoluble drug can be incorporated only up to 400 mg per tablet or less. On the other hand water soluble drug can be incorporated only up to 60 mg
- Fragility and poor stability of dosage form during storage under stressful conditions.

Orasolv technology:

It is CIMA lab's first mouth dissolving formulation. This technology involves taste masking of active drug. Effervescent disintegrating agent is also used. Conventional blenders and tablet equipment's are used for preparation of tablets. Less force of compaction is used for manufacturing so as to obtain soft and quickly disintegrating tablets. There is a limitation of this technology that soft and fragile tablets are formed, therefore needed to be packed in specially designed pick and place package system.

Durasolv technology:

This too has been developed by CIMA labs. This is one of the suitable technologies to prepare products requiring low amounts of active drug. This technology uses drug, fillers and a lubricant to prepare the tablet. Conventional tableting equipment is used to prepare the tablet. Due to higher force of compaction used, tablets prepared are rigid. Dosage form can be packaged into conventional packaging system like blisters.

Wow tab technology:

Yamanauchi pharmaceutical company patented this technology. 'Wow' means 'without water'. The active ingredients may constitute up to 50% w/w of the tablet. In this technique, saccharides of both low and high mouldability are used to prepare the granules. Mouldability is the capacity of a compound to be compressed.

Highly Moldable substance has high compressibility and thus shows slow dissolution. The combination of high and low mouldability is used to produce tablets of adequate hardness. Active ingredients are mixed with low mouldability saccharides and then granulated with high mouldability saccharides and then compressed into tablet. The Wowtab product dissolves quickly in 15 s or less. Wowtab product can be packed in both into conventional bottle and blister packs

Flashdose Technology:

This technology is patented by Fuisz. This system uses the combination of both Shear form and Ceform technologies in order to mask the bitter taste of the drug. A sugar based

matrix, called 'Floss' is used, which is made up of a combination of excipients (crystalline sugars) alone or in combination with drugs. Nurofen meltlet, a new form of Ibuprofen, as a mouth-dissolving tablet is the first commercial product prepared by this technology and launched by Biovail Corporation.

Drawbacks

- The dosage form can accommodate only up to 600 mg of drug.
- Tablets produced are highly friable, soft and moisture sensitive.

Flashtab technology:

Prographarm labs. Have a patent over this technology. In this technology, micro granules of the taste-masked active drug are used. These may be prepared by using conventional techniques like coacervation, microencapsulation, and extrusion-spheronisation. All these processes utilize conventional tableting technology. These taste-masked micro crystals of active drug, disintegrating agent, a swelling agent and other excipients like soluble diluents etc. are compressed to form a multiparticulate tablet that disintegrates rapidly.[10]

Shearform Technology:

In this technology, a shearform matrix, 'Floss' is prepared. Feedstock prepared with a sugar carrier is subjected to flash heat processing. In this process, sugar is simultaneously subjected to centrifugal force and to a temperature gradient, which causes the temperature of the mass to rise and hence an internal flow condition is created, permitting part of it to move with respect of the mass. The flowing mass comes out through the spinning head that flings the floss. The produced floss is amorphous in nature. So, by various techniques, it is further chopped and recrystallized to provide a uniform flow, thus facilitate blending. Then the recrystallized matrix, active drug and other excipients are blended together and finally compressed into tablets. Active drug and other excipients may be blended with the floss before recrystallizing it.

Ceform technology:

This technology involves preparation of microspheres of the active drug. Drug material alone or in combination with other pharmaceutical substances, and excipients is placed into a precision engineered rapidly spinning machine. The centrifugal force comes into action, which throws the dry drug blend at high speed through small heated openings. Due to the heat provided by carefully controlled temperature, drug blend liquefies to form a sphere, without affecting the drug stability. The microspheres thus formed are compressed into tablets. As the drug and excipients both can be processed simultaneously, it creates a unique microenvironment in which the materials can be incorporated into the microspheres that can alter the characteristics of the drug, such as enhancing solubility and stability.

Nanocrystal technology:

For MDT, Elan's proprietary NanoCrystal technology can enable formulation and improve compound activity and final product characteristics. Decreasing particle size increases the surface area, which leads to an increase in dissolution rate. This can be accomplished predictably and efficiently using NanoCrystal technology. NanoCrystal particles are small particles of drug substance, typically less than 1000 nanometers (nm) in diameter, which are produced by milling the drugs for fast dissolving tablets, Elan's proprietary NanoCrystal technology can enable formulation and improve compound activity and final product characteristics. Decreasing particle size increases the surface area, which leads to an increase in dissolution rate. This can be accomplished predictably and efficiently using NanoCrystal technology.

NanoCrystal colloidal dispersions of drug substance are combined with water-soluble GRAS (Generally Regarded as Safe) ingredients, filled into blisters, and lyophilized. The resultant wafers are remarkably robust, yet dissolve in very small quantities of water in seconds. [11]

Marketed products

Brand name	Drug	Pharmaceutical company
Benadryl Fastmelt	Diphenhydramine	Pfizer Ltd. New York.
Benadryl Fastmelt	Diphenhydramine and Psudoephedrine	Warner Lambert NJ USA.
Cibalginadue Fast	Ibuprofen	Novartis Consumer Health. New York.
Domray MD	Domperidone	Ray Remedies. Mumbai.
Dolib MD	Rofecoxib	Panacea Biotech Ltd. New Delhi.
Febretol	Paracetamol	Prographarm Thymerais. France.
Kemstro	Beclofen	Schwarz Pharma Monheim. Germany.
Orthoref MD	Rofecoxib	Biochem Pharma Pvt Ltd. Mumbai.
Rofaday MT	Rofecoxib	Lupin Labs. Mumbai.

Important patent technologies for preparation of FDTs

S.no	Technique	Advantages	Disadvantages
1.	Zydis	Quick dissolution, self-preserving and increased bioavailability.	Expensive process, poor stability at higher temperature and humidity.
2.	Orasolv	Taste masking is twofold, quick dissolution	Low mechanical strength.
3.	Durasolv	Higher mechanical strength than Orasolv, Good rigidity.	Inappropriate with larger dose.
4.	Flashdose	High surface area for dissolution	High temperature required to melt the matrix can limit the use of heat-sensitive drugs, sensitive to moisture and humidity.
5.	Flashtab	Only conventional tableting technology	—
6.	Wow tab	Adequate dissolution rate and hardness.	No significant change in bioavailability
7.	Oraquick	Faster and efficient production, appropriate for heat-sensitive drugs.	—
8.	Ziplet	Good mechanical strength, satisfactory properties can be obtained at high dose (450mg) and high weight (850mg)	As soluble component dissolves, rate of water diffusion in to tablet is decreased because of formation of viscous concentrated solution

Packaging

Packaging special care is required during manufacturing and storage to protect the dosage of other fast dissolving dosage forms. Quick dispersing and dissolving oral delivery system can be packaged using various option, such as single pouch, blister card with multiple unit dispenser, depending on the application and marketing objectives.

CONCLUSION

Fast dissolving tablets are innovative dosage forms developed and specially designed to overcome some of the problems that seen in conventional solid dosage form i.e. difficulty in swallowing of the tablet in geriatric and pediatric patients. Fast dissolving tablets are designed to dissolve or disintegrate quickly in the saliva generally within less than 60 seconds (range of 5-60 seconds). Fast dissolving tablets have better patient compliance and acceptance may improve biopharmaceutical properties, bioavailability improved efficacy, convenience, and better safety compared with conventional oral dosage forms. The popularity of FDTs has increased fabulously over the last decade. FDTs need to be formulated for psychotic patients, bedridden, geriatric, pediatric patients, for those patients who may not have access to water, patients who are busy in traveling. FDTs formulations formulated by some of these conventional and patent technologies and FDTs have sufficient mechanical strength.

REFERENCES

1. Tejvir Kaur., Bhawandeep Gill., Sandeep Kumar., Gupta G D., “Mouth Dissolving Tablets”. Int J. Cur Pharm Res. 2011;3(1):1-7.

2. Ujjwal Nautiyal., Satinderjeet Singh., Ramandeep Singh., Gopal., Satinder Kakar., “Fast Dissolving Tablets as a Novel Boon”. J. Pharm. Chem. Bio. Sci. 2014;2(1):5-26.

3. Alok Kumar Gupta., Anuj Mittal., Jha K K. “Fast Dissolving Tablets”. J.Pharm. 2012;1(1):1-8.

4. Dipan Roy, Anjan De, Souvik Biswas, Nabanita Pramanick, Arijit Das, Sriparna Mondal, Fast dissolving tablets: Past, present and future, Indian Drugs, 2010;47(6):5-11.

5. Arunachalam A., Karthikeyan M., AshutoshKumar., Kishore Konam., Potabathula hari Prasad., Sethuraman S., Manidipa S. “Fast Dissolving Drug Delivery System”. J. Glo Tre Pharm Sci. 2010;1(1):92-110.

6. Ved Parkash, Saurabh Maan, Deepika, Shiv Kumar Yadav2, Hemlata, Vikas Jogpal, Fast disintegrating tablets: Opportunity in drug delivery system, JAPTR, 2011;2(4):223-235.

7. Ashish P., Harsoliya M S., Pathan M K., Shruti S., “Formulation of Mouth Dissolving Tablet”. Int. J. Pharm. Cli. Sci. 2011;3(5),1-8.

8. Nehal Siddiqui Md., Garima Garg., Pramod Kumar Sharma., “Fast Dissolving Tablets”. Int.J.Pharm. Sci. 2010;4(2):87-96.

9. Deshmukh Keshav Ram., Patel Vidyanand., Verma Shekhar., Pandey Alok Kumar., Dewangan Pramod., 2011. “A Mouth Dissolving Tablet Technique”. Int J. Res Ayur Pharm. 2011;2(1): 66-74.

10. Kulkarni S D., Pawar S P., Bakliwal S R., Rane B R., Gujrathi N A., “Mouth Dissolving Tablet”. Int. J. Res. Ayur. Pharm. 2011;2(4):1117-1123.

11. Yourong Fu., Shicheng Yang., Seong Hoon Jeong., Susumu Kimura., Kinam Park., “Orally Fast Dissolving Tablets”. The Dru Car Sys. 2014;21(6):433-475.

Source of Support: The author(s) received no financial support for the research, authorship, and/or publication of this article.

Conflict of Interest: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.