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FAST DISSOLVING TABLETS: A NOVEL APPROACH TO DRUG DELIVERY

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ABSTRACT

Fast dissolving tablets (FDTs) have received ever-increasing demand during the last decade, and the field has become a rapidly growing area in the pharmaceutical industry. 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. Fast- or mouth dissolving tablets have been formulated for pediatric, geriatric, and bedridden patients and for active patients who are busy and traveling and may not have access to water. This article reviews the Need, advantages, challenges, limitations, mechanism of superdisintegrants, various formulation technologies (conventional and patented), marketed product of Fast dissolving tablets.

Key Words: Fast dissolving tablets (FDTs), Direct compression.

INTRODUCTION

Recent advances in Novel Drug Delivery System (NDDS) aims to enhance safety and efficacy of already used drug molecule by formulating a convenient dosage form for administration and to achieve better patient compliance. To develop a chemical entity, a lot of

money, hard work and time are required. So focus is rather being laid on the development of new drug delivery systems for already existing drugs, with enhanced efficacy and bioavailability, thus reducing the dose and dosing frequency to minimize the side effects. [1] various pharmaceutical dosage forms which can improve patient compliance have been actively developed. Among them, a fast dissolving tablets (FDTs) is one of the most promising dosage forms. [2]

Tablet is the most popular dosage form among all existing dosage form, but in some instances due to the large size of dosage forms, and in case of uncooperative, pediatric and dysphasia patients, it may create some problems. Many patients find difficulty to swallow tablets and hard gelatine capsules. Consequently they do not take medications as prescribed. It is estimated that 50% of the population is affected by this problem which results in a high incidence of incompliance and ineffective therapy. To overcome these problem, a new form of dosage form is developed, which is known as fast dissolving tablet or mouth dissolving tablet. These tablets are the advanced dosage form which is dissolve within few seconds after placing on the tongue. FDT are preferred by an increasing number of patients especially children and elderly, but also adult consumers who like to have their medication readily available at any time. Fast dissolving tablets have gained considerable attention as a preferred alternative to conventional tablets and capsules due to better patient compliance. [3-4]

Recently the European Pharmacopoeia adopted the term orodispersible tablet as a tablet to be placed in the mouth where it disperses rapidly before swallowing and which disintegrates in less than 3 min.[5] The key properties of FDTs are fast absorption of water into the core of the tablets and disintegration of associated particles into individual components for fast dissolution.[6] These tablets display a fast and spontaneous de-aggregation in the mouth, soon after the contact with saliva, though they can be handled or extracted from the package without alteration. The active agent can thus rapidly dissolve in the saliva and be absorbed through whatever membrane it encounters, during deglutition, unless it is protected from pre-gastric absorption. To fullfil these requirements, tablets must be highly porous, incorporating hydrophilic excipients, able to rapidly absorb water for a rapid deaggregation of the matrix. Different techniques, such as freeze drying or moulding or direct compression, are currently employed to prepare the formulations of this type present on the pharmaceutical market. [7]

THE NEED FOR DEVELOPMENT OF FDTS

The need for non-invasive delivery systems persists due to patients' poor acceptance of, and compliance with, existing delivery regimes, limited market size for drug companies and drug uses, coupled with high cost of disease management.

A. **Patient factors-** Orally disintegrating dosage forms are particularly suitable for patients, who for one reason or the other, find it inconvenient to swallow traditional tablets and capsules with an 8-oz glass of water. These include the following:

- Pediatric and geriatric patients who have difficulty in swallowing or chewing solid dosage forms.
- Patients who are unwilling to take solid preparation due to fear of choking.
- Very elderly patients who may not be able to swallow a daily dose of antidepressant.
- An eight-year old with allergies who desires a more convenient dosage form than antihistamine syrup.
- A middle-aged woman undergoing radiation therapy for breast cancer may be too nauseous to swallow her H2- blocker.
- A schizophrenic patient in an institutional setting who may try to hide a conventional tablet under his or her tongue to avoid their daily dose of an atypical antipsychotic.
- A patient with persistent nausea, who may be journey, or has little or no access to water.

B. **Effectiveness factor-** Increased bioavailability and faster onset of action are a major claim of these formulations. Dispersion in saliva in oral cavity causes pregastric absorption from some formulations in those cases where drug dissolves quickly. Buccal, pharyngeal and gastric regions are all areas of absorption for many drugs. Any pregastric absorption avoids first pass metabolism and can be a great advantage in drugs that undergo a great deal of 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 pregastric segments of GIT.

C. **Manufacturing and marketing factors**- Developing new drug delivery technologies and utilizing them in product development is critical for pharmaceutical industries to

survive, regardless of their size. 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, value-added product line extension, and extend patent protection, while offering its patient population a more convenient dosage form. This leads to increased revenue, while also targeting underserved and under-treated patient populations. As examples, Eisai Inc. launched Aricept ODT, a line extension of donepezil for Alzheimer's disease, in Japan in 2004 and in the U.S. in 2005 in response to a generic challenge filed in the U.S. by Ranbaxy. Merck's Japanese subsidiary launched Lipola M (simvastatin ODT), a line extension of its block-buster, Zocor®, a cholesterol-lowering drug, in response to seventeen generic registrations of simvastatin applied for in Japan in 200424.Marketers build a better brand and company image when they offer a unique easier-to-take form that satisfies the need of an underserved patient population.[8]

IDEAL PROPERTIES OF FDTs

A. It should not be require water for oral administration yet disintegrates and dissolves in oral cavity within a few seconds.
B. It should have sufficient strength to withstand the rigors of the manufacturing process and post-manufacturing handling.
C. It should allow high drug loading.
D. It should be Pleasant mouth feel.
E. It should be insensitive to environmental conditions such as humidity and temperature.
F. It should be adaptable and amenable to existing processing and packaging machineries.
G. It should be Cost-effective. [9]

ADVANTAGES OF FDTs

A. Ease of administration to patients who cannot swallow, such as the elderly, stroke victims and bedridden patients; patients who should not swallow, such as renal failure patients; and who refuse to swallow, such as pediatrics, geriatric and psychiatric patients.

B. Patient's compliance for disabled bedridden patients and for travelling and busy people who do not have ready access towater.
C. Good mouth feel property of Mouth dissolving drug delivery system helps to change the basic view of medication drugs.
D. Convenience of administration and accurate dosing as compared to liquid formulations.
E. Benefit of liquid medication in the form of solid preparation.
F. More rapid drug absorption from the pre-gastric area i.e. mouth, pharynx and esophagus which may produce rapid onset of action.
G. Pre-gastric absorption can result in improved bioavailability, reduced dose and improved clinical performance by reducing side effects.
H. New business opportunities: product differentiation, line extension and life-cycle management, exclusivity of product promotion and patent-life extension. [10-11]

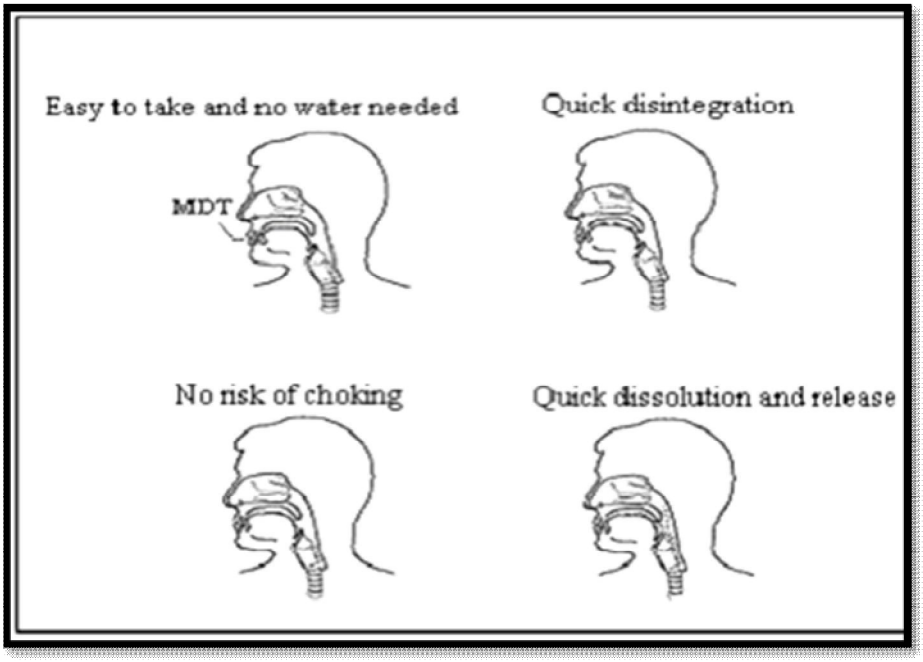

Fig. 1: Advantages of FDT

CHALLENGES IN THE FORMULATION OF FDTs

A. Rapid disintegration of tablet.
B. Avoid increase in tablet size.
C. Have sufficient mechanical strength.
D. Minimum or no residue in mouth.

E. Protection from moisture.
F. Compatible with taste masking technology.
G. Not affected by drug properties. [12]

LIMITATIONS OF FDTs

A. Careful handling is required because tablets usually have insufficient mechanical strength.
B. If tablets are not formulated properly they may leave unpleasant taste or grittiness in the mouth.
C. Drugs difficult to formulate into FDT with relatively larger doses.
D. Drugs with short half-life and frequent dosing and those whom require controlled or sustained release are unsuitable candidates of FDTs. [13]

SUPER DISINTEGRANTS USED IN FDTs

As day's passes, demand for faster disintegrating formulation is increased. So, pharmacist needs to formulate disintegrants i.e. Superdisintegrants which are effective at low concentration and have greater disintegrating efficiency and they are more effective intragranularly.

A. Factors to be considered for selection of superdisintegrants

- It should produce mouth dissolving when tablet meets saliva in the mouth
- It should be compactable enough to produce less-friable tablets.
- It can able to produce good mouth feel to the patient. Thus, small particle size is preferred to achieve patient compliance.
- It should has good flow since it improve the flowability of the total blend. [14]

B. Mechanism of action of disintigrants

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

i. By capillary action
ii. By swelling
iii. Because of heat of wetting
iv. Due to release of gases
v. By enzymatic action
vi. Due to disintegrating particle/particle repulsive forces
vii. Due to deformation

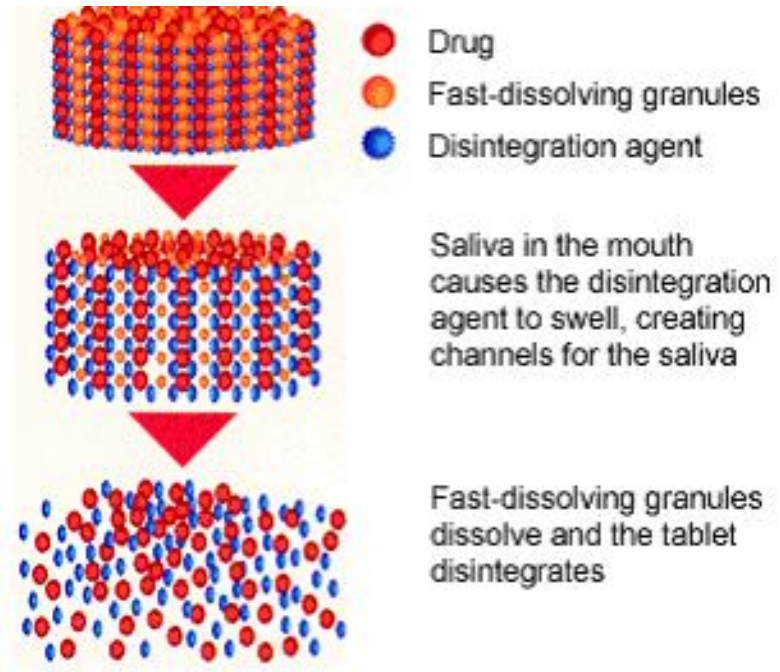

Fig. 2: Mechanism of Action of Superdisintegrants.

i. **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. For these types of disintegrants, maintenance of porous structure and low interfacial tension towards aqueous fluid is necessary which helps in disintegration by creating a hydrophilic network around the drug particles.

ii. **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.

iii. **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.

iv. **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.

v. **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.

vi. **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 nonswelling 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.

vii. **Due to deformation-** Hess had proved that during tablet compression, disintegranted 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 break up of the tablet. This may be a mechanism of starch and has only recently begun to be studied. [15]

TECHNOLOGIES USED FOR MANUFACTURING FDTs.

The technologies used to manufacture FDTs are classified in Fig 3

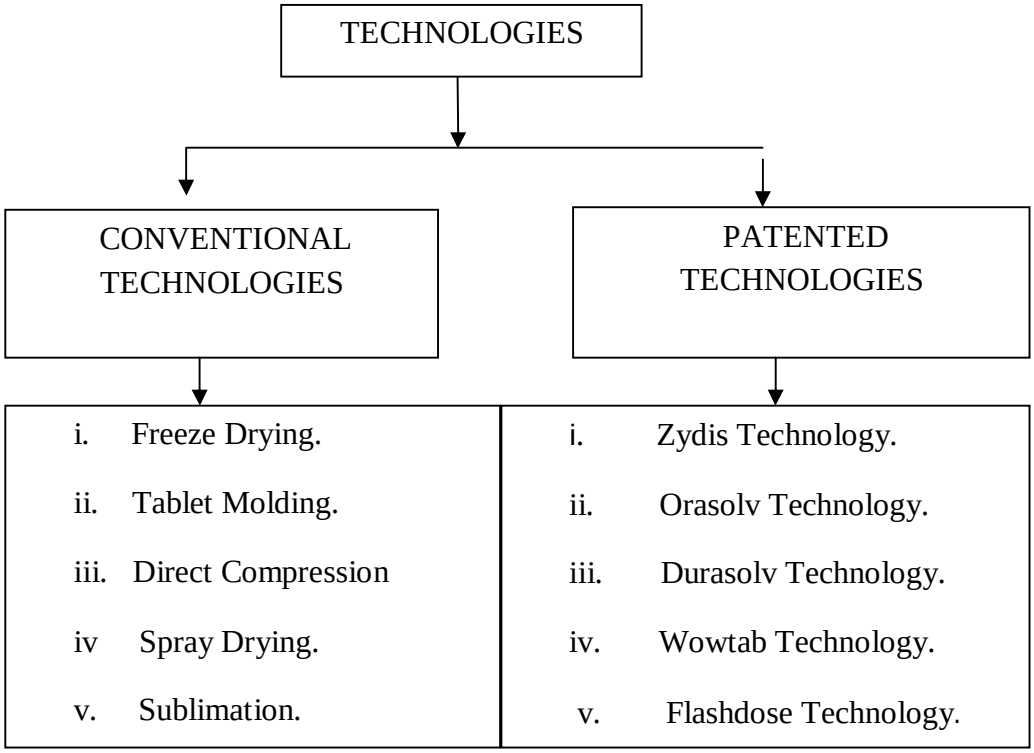

Fig. 3: Various technologies used to manufacture FDTs.

A. Conventional technologies

i. **Freeze drying-** Freeze-drying or lyophilization can be utilized to prepare mouth-dissolving tablets, which are very porous in nature and which quickly disintegrate or dissolve upon contact with saliva. This method involves incorporation of the drug in water-soluble matrix, which is then transferred to the preformed blister with peelable foil, as the Zydis units are not strong enough to withstand being pushed through the lidding foil of a conventional blister; freeze drying is then done toremove water by sublimation. [16]

ii. **Tablet Molding-** Molding process includes moistening, dissolving, or dispersing the drug with a solvent then molding the moist mixture into tablets (compression molding with lower pressure than conventional tablet compression), evaporating the solvent from drug solution or suspension at ambient pressure (no vacuum lyophilization), respectively. The molded tablets formed by compression molding are dried. As the compression force applied is lower than conventional tablets, the molded tablets

results in highly porous structure, which increases the disintegration and dissolution rate of the product.[17]

iii. **Direct Compression-** This is the most preferred technique to manufacture the tablets due to certain advantages:

a. High doses can be accommodated and final weight of the tablet can exceed that of other methods.
b. Easiest way to manufacture the tablets.
c. Conventional equipment and commonly available excipients are use
d. A limited no. of processing steps are involved.
e. Cost-effectiveness.
f. Tablet size and hardness strongly affect the disintegrant efficacy. Optimum kind and concentration of disintegrant should be chosen to achieve quick disintegration and high dissolution rates.[18]

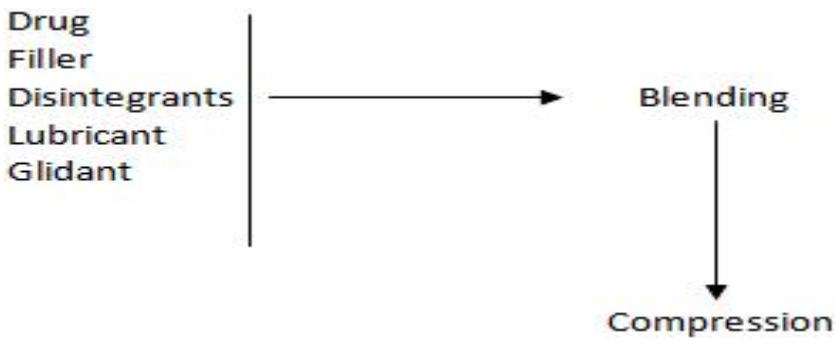

Fig. 4: Flow Sheet of the Direct Compression Process.

iv. **Spray-Drying**- Highly porous, fine powders are obtained by this method. The ODT formulations consisted of hydrolyzed/unhydrolyzed gelatin as supporting agent for matrix, mannitol as bulking agent, and sodium starch glycolate or croscarmellose sodium as disintegrating agent. Disintegration and dissolution were further improved by adding effervescent components, i.e. Citric acid (an acid) and sodium bicarbonate (an alkali). The formulation was spray dried to yield a porous powder. The ODT made from this method disintegrated in <20 s.[19]

v. **Sublimation-** The slow dissolution of the compressed tablet containing even highly water-soluble ingredients is due to the low porosity of the tablets. Inert solid ingredients that volatilize readily (e.g. urea, ammonium carbonate, ammonium

bicarbonate, hexa methelene tetramine, camphor etc.) were added to the other tablet ingredients and the mixture is compressed into tablets. The volatile materials were then removed via sublimation, which generates porous structures. Additionally, several solvents (e.g. cyclohexane, benzene) can be also used as pore forming agents.

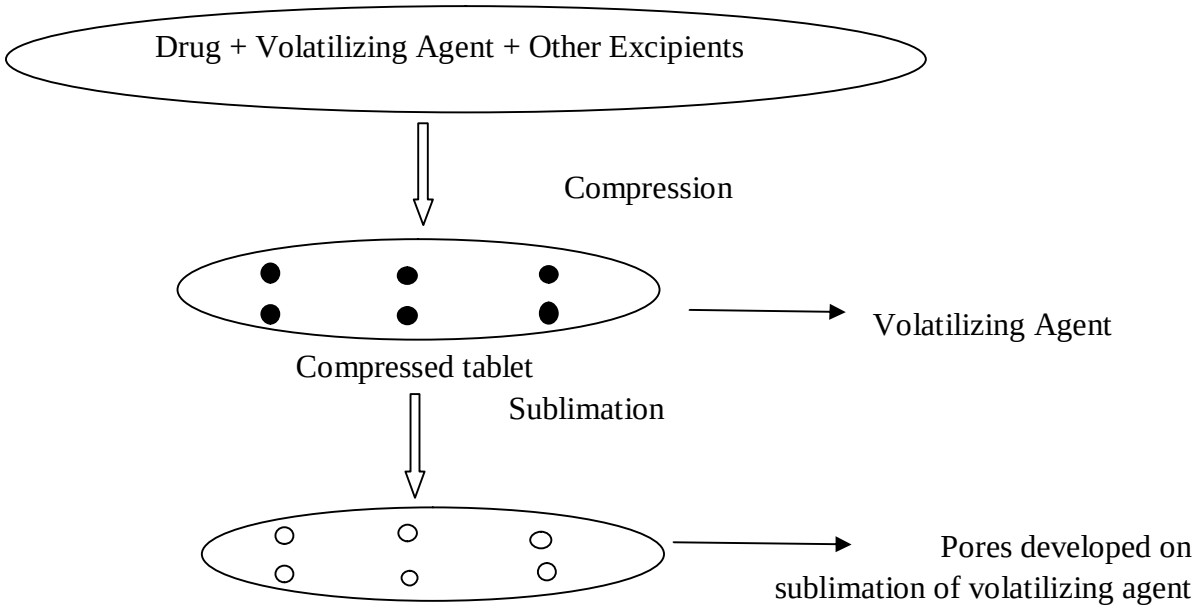

Fig.5: – Steps Involved in sublimation

vi. **Mass-Extrusion**- This technology involves softening the active blend using the solvent mixture of water soluble polyethylene glycol, using methanol and expulsion of softened mass through the extruder or syringe to get a cylinder of the product into even segments using heated blade to form tablets. The dried cylinder can also be used to coat granules of bitter tasting drugs and thereby masking their bitter taste.[20]

vii. **Cotton Candy Process-**The FLASHDOSE® is a MDDDS manufactured using Shearform™ technology in association with Ceform TI™ technology to eliminate the bitter taste of the medicament. A matrix known as 'floss', with a combination of excipients, either alone or with drugs is prepared by using shear form technology. Thermolabile drugs can be safely incorporated into the formulation. This process results in a highly porous product and offer very pleasant mouth feel due to fast solubilization of sugars in presence of saliva.[21]

viii. **Fast Dissolving Films-** In this technique, water soluble film forming polymer (pullulan, CMC, HPMC, HEC, HPC, PVP, PVA etc.), drug and other taste masking ingredients are dissolved in non-aqueous solvent to prepare non-aqueous solution, which on evaporation of solvent forms a film. Resin adsorbate or coated micro particles of the drug can be incorporated into the film if the drug is bitter. This system forms the thin films of size less than 2 X 2 inches which dissolves within 5 sec with instant drug delivery and flavored taste.[22]

B. Patented technologies

i. **Zydis**-Zydis, the best known of the fast-dissolving/disintegrating tablet preparations, was the first marketed new technology tablet. The tablet dissolves in the mouth within seconds after placement on the tongue. A Zydis tablet is produced by lyophilizing or freeze-drying the drug in a matrix usually consisting of gelatin. The product is very lightweight and fragile, and must be dispensed in a special blister pack. Patients should be advised not to push the tablets through the foil film, but instead peel the film back to release the tablet. The Zydis product is made to dissolve on the tongue in 2 to 3 seconds. The Zydis formulation is also self-preserving because the final water concentration in the freeze-dried product is too low to allow for microbial growth.[23]

ii. **Orasolv Technology-**Orasolv Technology has been developed by CIMA labs. In this system active medicament is taste masked. It also contains effervescent disintegratingagent. Tablets are made by direct compression technique at low compression force in order tominimize oral dissolution time. Conventional blender sand tablet machine is used to produce the tablets.[24]

iii. **Durasolv Technology-**Durasolv is the patented technology of CIMA labs. The tablets made by this technology consist of a drug, fillers and a lubricant. Tablets are prepared by using conventional tableting equipment and have good rigidity. Durasolv is anappropriate technology for products requiring low amounts of active ingredients.

iv. **Wowtab Technology-**Yamanauchi pharmaceutical company patented this technology. ‘wow’ means ‘without water’. The active ingredients may constitute upto 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. The combination of high and low mouldability is used to produce tablets of adequate hardness.[25]

v. **Flash Dose Technology-** Fuisz has patented Flashdose technology. Nurofen meltlet, a new form of ibuprofen as melt-in-mouth tablets, prepared using flashdose technology is the first commercial product launched by Bioavail Corporation. Flashdose tablets consist of self-binding shearform matrix termed as "floss." Shearform matrices are prepared by flash heat processing.[26]

vi. **Oraquick technology-** The oraquick ODT formulation utilizes a patented taste masking technology by K V Pharmaceutical Company, who claims that its taste masking technology i.e., microsphere technology (Micromask) has superior mouth feel over taste masking alternatives. Tablet with significant mechanical strength without disrupting taste masking are obtained after compression. Oraquick claims quick dissolution in matter of seconds with good taste masking.[27]

vii. **Nanocrystal technology-** This is patented by Elan, King of Prussia. Nanocrystal technology includes lyophilization of colloidal dispersions of drug substance and water soluble ingredients filled into blister pockets. As manufacturing losses are negligible, this process is useful for small quantities of drug.

viii. **Pharmaburst technology-** SPI Pharma, New castle, patents this technology. It utilizes the coprocessed excipients to develop ODT, which dissolves within 30-40 s. This technology involves dry blending of drug, flavor, and lubricant followed by compression into tablets. Tablets obtained have sufficient strength so they can be packed in blister packs and bottles.

ix. **Frosta technology-** Akina patents this technology. It utilizes the concept of formulating plastic granules and coprocessing at low pressure to produce strong tablets with high porosity. The process involves usually mixing the porous plastic material with water penetration enhancer and followed by granulating with binder. The tablets obtained have excellent hardness and rapid disintegration time ranging from 15 to 30s depending on size of tablet.[28]

PREFORMULATION STUDIES OF FDTs

Preformulation study relates to pharmaceutical and analytical investigation carried out proceeding and supporting formulation development efforts of the dosage form of the drug substance. Preformulation yields basic knowledge necessary to develop suitable formulation for the toxicological use. It gives information needed to define the nature of the drug substance and provide frame work for the drug combination with pharmaceutical excipients in the dosage form. Hence, the following preformulation studies were performed on the obtained sample of drug. [29]

1. Bulk Density

Apparent bulk density ρ_b was determined by pouring the blend into a graduated cylinder. The bulk volume (V_b) and weight of powder (M) was determined. The bulk density was calculated using the formula

$$\rho_b = \frac{M}{V_b}$$

2. Tapped Density

The measuring cylinder containing a known mass of blend was tapped 100 times using density apparatus. The minimum volume (V_t) occupied in the cylinder and the weight (M) of the blend was measured. The tapped density (ρ_t) was calculated using the formula

$$\rho_t = \frac{M}{V_t}$$

3. Compressibility Index

The simplest way for measurement of flow of powder is its compressibility, an indication of the ease with which a material can be induced to flow is given by compressibility index (I) which is calculated as follows

$$I = \frac{\rho_t - \rho_b}{\rho_t} \times 100$$

Where, ρ_t = Tapped density and, ρ_b = Bulk density

Table 1: Compressibility Index as an Indication of Powder Flow Properties

Carr's Index (%)	Type of flow
>12	Excellent
12.0-16	Good
18-21	Fair to passable
23-35	Poor
33-38	Very poor
>40	Extremely poor

4. Hausner Ratio

Hausner ratio (HR) is an indirect index of ease of powder flow. It is calculated by the following formula.

$$HR = \frac{\rho t}{\rho b}$$

Where, ρ_t is tapped density and ρ_b is bulk density.

Lower Hausner ratio (< 1.25) indicates better flow properties than higher ones (> 1.25).

5. Angle of Repose

Angle of Repose was determined using funnel method. The blend was poured through a funnel that can be raised vertically until a specified cone height (h) was obtained. Radius of the heap (r) was measured and angle of repose (θ) was calculated using the formula

$$Tan\theta = \frac{h}{r}; \qquad \text{Therefore; } \theta = Tan^{-1}\left(\frac{h}{r}\right)$$

Where, θ is Angle of Repose; h is height of cone; r is radius of cone.

Table 2: Angle of Repose as an Indication of Powder Flow Properties [31-34]

Angle of repose(°)	Type of flow
<25	Excellent
25-30	Good
30-40	Passable
>40	Very poor

EVALUATION OF FDTs

1. General Appearance

The general appearance of a tablet, its visual identification and over all 'elegance' is essential for consumer acceptance. These include tablet's size, shape, colour, presence or absence of an odour, taste, surface texture, physical flaws.

2. Tablet Thickness

Tablet thickness is an important characteristic in reproducing appearance and also in counting by suing filling equipment. Some filling equipment utilizes the uniform thickness of the tablets as a counting mechanism. Ten tablets were taken and their thickness was recorded using micrometer.

3. Uniformity of Weight

I.P procedure for uniformity of weight was followed, twenty tablets were taken and their weight was determined individually and collectively on a digital weighing balance. The average weight of one tablet was determined from the collective weight. The weight variation test would be satisfactory method of determining the drug content uniformity.

Average of Tablets (mg)	Maximum % difference allowed
130 or less	10
130-324	7.5
More than 324	5

4. Hardness

Hardness of tablet is defined as the force applied across the diameter of the tablet in order to break the tablet, the resistance of the tablet to chipping, abrasion or breakage under condition of storage transformation and handling before usage depends on its hardness. Hardness of the tablet of each formulation was determined using Pfizer Hardness Tester.

5. Friability

Friability of the tablets was determined using Roche friabilator. This device subjects the tablets to the combined effect of abrasions and shock in a plastic chamber revolving at 25 rpm and dropping the tablets at a height of 6 inch in each revolution. Preweighed sample of tablets was placed in the friabilator and were subjected to 100 revolutions. Tablets were de dusted using a soft muslin cloth and reweighed. The friability (F%) is given by the formula

$$F\% = \left(1 - \frac{Wo}{W}\right) X 100$$

Where, W_0 is weight of the tablets before the test and W is the weight of the tablets after test.

6. *In vitro* Disintegration Test

Disintegration of fast disintegrating tablets is achieved by saliva in the mouth, however amount of saliva in the mouth is limited and no tablet disintegration test was found in USP and IP to simulate *in vivo* conditions. A modified version of the simple but novel method developed was used to determine disintegration time of the tablets. A cylindrical vessel was used in which 10-mesh screen was placed in such way that only 2 ml of disintegrating or dissolution medium would be placed below the sieve. To determine disintegration time, 6ml of Sorenson's buffer (pH 6.8), was placed inside the vessel in such way that 4ml of the media was below the sieve and 2ml above the sieve. Tablet was placed on the sieve and the whole assembly was then placed on a shaker. The time at which all the particles pass through the sieve was taken as a disintegration time of the tablet. Six tablets were chosen randomly from the composite samples and the average value was determined. [29-34]

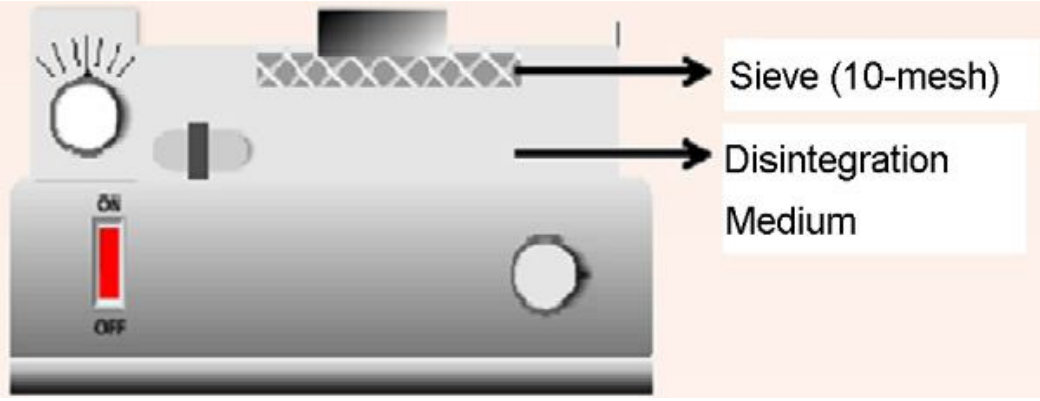

Fig. 6: Device used to determine the disintegration time of FDTs.

7. Wetting Time

The method was followed to measure tablet wetting time. A piece of tissue paper (12 cm X 10.75 cm) folded twice was placed in a small Petri dish (ID = 65 cm) containing 6 ml of Sorenson's buffer (pH 6.8), A tablet was put on the paper, and the time for the complete wetting was measured. Three trials for each batch were performed and the standard deviation was also determined

8. *In vitro* Dispersion Time

In vitro dispersion time was measured by dropping a tablet in a glass cylinder containing 6 ml of Sorenson's buffer (pH 6.8). Three tablets from each formulation were randomly selected and in vitro dispersion time was performed. [35]

Fig. 7: *In Vitro* Disintegration Property

CONCLUSION

Our review article examine that, Fast dissolving tablets had various advantage of dosage form, ideal for pediatric and geriatric patients and rapid onset of action. Due to such wide significance, this new generation drugs are very easily deliver by this system and may lead to better patient compliance and ultimate clinical output. Hence, in future patient demand and

the availability of various technologies have increased the market share of fast dissolving tablets, which in turn prolongs the patient life and expect technology to be more popular.

TABLE 3: Drugs Which Can Be Incorporated In Fast Dissolving Tablets. [20, 29]

S. NO.	CATEGORY	EXAMPLES
1.	Analgesics and anti-inflammatory agents	Piroxicam, Diclofnac, Ibuprofen, ketoprofen, sulindac, Indomethacin, Mefenamic acid, Phenylbutazone, Naproxen.
2.	Anti-epilectics	Carbamazepine, Methsuximide, Phenytoin, Primidone, Phenobarbitone, Valproic acid, Phensuximide, Oxcarbazepine.
3.	Anti-fungal agents	Clotrimazole, Amphotericin, Griseofulvin, Ketoconazole, Miconazole, Terbinafine, Fluconazole.
4.	Antimalarial	Chlorquine, Mefloquine, Proguanil, Pyrimethamine.
5.	Anti-gout agents	Allopurinol, Probenecid, Sulphinpyrazone.
6.	Anti-hypertensive agents	Amlodipine, Dilitazem, Valsartan, Nifedipine, Diazoxide, Prazosin.
7.	Antibacterial-agents	Clarithromycin, Ciprofloxaci, Rifampicin, Erythromycin.
8.	Anti-neoplastic agents	Chlorambucil, Methotrexate, Cyclosporin, Estramustine, Dacarbazine.
9.	Anti-thyroid agents	Carbimazole, Propylthiouracil.

Table 4: List of Marketed product of FDTs. [36]

S. No.	Trade Name	Active Drug	Manufacturer
1.	Felden fast melt	Piroxicam	Pfizer Inc., NY, USA
2.	Claritin redi Tab	Loratidine	Schering Plough Corp., USA
3.	Maxalt MLT	Rizatriptan	Merck and Co., NJ, USA
4.	Zyprexia	Olanzapine	Eli Lilly, Indianapolis, USA
5.	Pepcid RPD	Famotidine	Merck and Co., NJ, USA
6.	Zofran ODT	Ondansetron	Glaxo Wellcome, Middlesex, UK
7.	Zoming-ZMT	Zolmitriptan	AstraZeneca, Wilmington, USA
8.	Zeplar TM	Selegilline	Amarin Corp. London, UK
9.	Tempra Quiclets	Acetaminophen	Bristol myers Squibb, NY, USA
10.	Febrectol	Paracetamol	Prographarm, Chateauneuf, France

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