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A Review On Fast Dissolving Tablet

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Abstract: The oral drug delivery system is mostly preferred due it convenient for administration, safe, improved compliance and economical route. Fast dissolving tablets are highly accepted fast growing drug delivery system. The one of the significant limitation of conventional dosage forms i.e tablet, capsule is Dysphagia which is overcome by using fast dissolving tablet formulation. Fast dissolving tablet are the dosage form which dissolve or disintegrate in saliva within few sec with or without need of water. Fast dissolving tablet gives fast onset of action, good bioavailability and avoid first pass metabolism. Fast dissolving tablet mainly used in diseases like stroke, Parkinson's, neurological disorders, schizophrenic patient, hand tremor and also who have fear of chocking. FDTs are used especially in pediatric, gediatric, bedridden, and for the patient who are busy and travelling and may not access to water. This review includes introduction, features, properties, criteria, need, limitations, characteristics, various ingredients, challenges, evaluation parameters, and technologies.

Index Terms - Fast disintegrating tablet, Superdisintegrants, Oral drug delivery system.

I. INTRODUCTION

Recent development in Novel drug delivery system (NDDS) aims to improve safety and efficacy of already used drug molecule by formulating a acceptable dosage form for administration and to accomplish better patient compliance. A large amount of money, hard effort, and time are required to produce a chemical entity. As a result, the focus is now on developing new DDS for previously existing drugs with increased efficacy and bioavailability, Therefore lowering the amount and frequency of dosing to prevent side effects(1) . The recommended dosage forms are tablets and capsules, which have the disadvantage of being difficult to swallow. Dysphagia is also associated with a number of medical diseases such as stroke, Parkinson's disease, AIDS, head and neck radiation therapy, and other neurological disorders such as cerebral palsy. There is no need for water when administering a FDT, it has a quick onset of action, reduces the risk of asphyxia, and avoids hepatic first pass metabolism(2). Quick breakdown or quick disintegration tablet of the kind of those intended to disintegrate in the mouth within 60 second, ideally in less than 40 seconds when it comes in contact with saliva by forming a convenient suspension. It is most commonly known as "orodispersible tablets." "(3). FDT s are known by several names, such as "rapid melting, quick dissolving, oral disintegrating, or orodisperse." The European Pharmacopeia defines "orodisperse" as a tablet that can be placed in the mouth and quickly dispersed before swallowing(4). The US Food and Drug Administration (USFDA) defines a fast dissolving tablet (FDT) as "a solid dosage form containing a medicinal substance or active ingredient that disintegrates quickly generally within seconds when put on the tongue"(5) . drug absorbed through "oral cavity" directly goes into systemic circulation by a jugular vein ensures quick action, prevent first pass metabolism and drug degradation in gastric region and enzymatic hydrolysis in intestine(6). Rather than conventional tablets, FDTs appear to have better patient compliance and acceptance because to improved bioavailability, efficacy, and biological characteristics(7). Superdisintegrants are added to this formulation to increase tablet breakdown into small particles, and gives a rapid onset of action (6). The excipients used in FDDDS films include both soluble and insoluble excipients as well as substances that mask the taste of the active pharmaceutical ingredient, then which is swallowed with saliva (8).

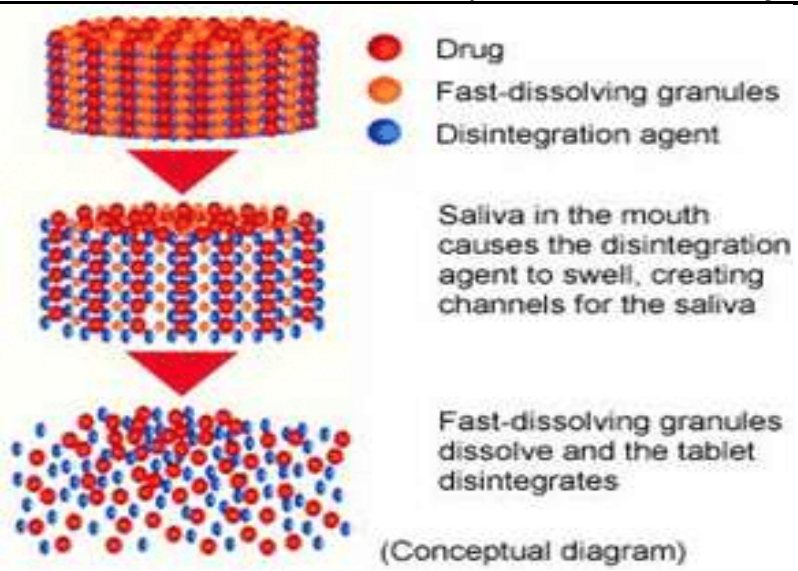


Figure 1: Conceptual diagram of fast dissolving tablet

1.1 Defination

Most often, a tablet that breakdown or solubilize in the mouth without need of water or chewing is a fast-acting drug delivery system. The majority of FDDDS films should contain taste masking substances. The soluble and insoluble excipients are subsequently swallowed by the patient along with this masked active ingredient(9).

1.2 Features:

Patient Compliance is simple and the administration of tablet particularly for those who have gulping problems, cardiac and renal difficulties/victims, bedridden patients, and patient who reject to swallow the dose structure, for example, geriatric, paediatric, and psychiatric patients(6).

- There is no requirement of water for oral disintegration of tablet, which is helpful for those who are travelling and cannot easily get water.
- Due to quick disintegration followed by dissolution it shows rapid onset of action.
- Due to it absorb through the mouth buccal mucosa which has better penetrability properties it shows improved bioavailability
- Pregastric absorption, assuming that it improves bioavailability. reduced portion and side effects, improved clinical efficacy(10).
- Because organoleptic qualities are more important in paediatric patients, the FDT will provide a pleasant mouth feel.
- Because it eliminates blockage and respiratory tract obstruction, FDT will be more secure than conventional dose structures(11).

1.3 Criteria for selection of drug:

- Dose lower than 20 mg.
- Free from bitter taste.
- Drug should have good solubility in water and saliva.
- It should have small to moderate molecular weight.
- Drug should have ability to penetrate through oral mucosa.
- The capacity to diffuse and partition into the upper GIT epithelium
- Drug with a short half-life and frequent dosing are not suitable for FDT (12,13) (5).

1.4 Need

Due to patients' low compliance and acceptance of recent delivery regimens, the small market size for drug companies and drug uses, as well as the high cost of disease treatment, the demand for non-invasive delivery systems continues. One such dose form that is helpful for geriatric adults generally showing symptoms like hand tremors and dysphasia is FDT(14).

- Paediatric patients whose internal muscles and central nervous systems have not developed completely are difficult to gulping effectively.
- Travelling patients without easily accessible water who suffer motion sickness and diarrhoea.
- Particularly for Patients with persistent nausea for an extensive period of time can't swallow.
- Patients with Mentally challenged, psychiatric patients and bedridden (15,16).

1.5 Limitations:

- The mechanical stability of tablets is one of the key issues with FDTs.
- FDT are very porous, soft moulded metrics, or compressed in a tablet with little compression, making it fragile and difficult to handle.

• FDTs are difficult to formulate which shows undesirable taste; special precautions must be taken when formulating such a type of drug.
• Several FDT are hygroscopic, difficult to formulate them due to maintain their physical integrity in normal conditions of humidity, requiring specialised packaging.
• For those who have a dry mouth due to decreased saliva production in that situation it's possible that these tablet formulations didn't work well.
• Overall bioavailability and the rate of absorption from the saliva solution.
• Stability of drug and dosage form(17).

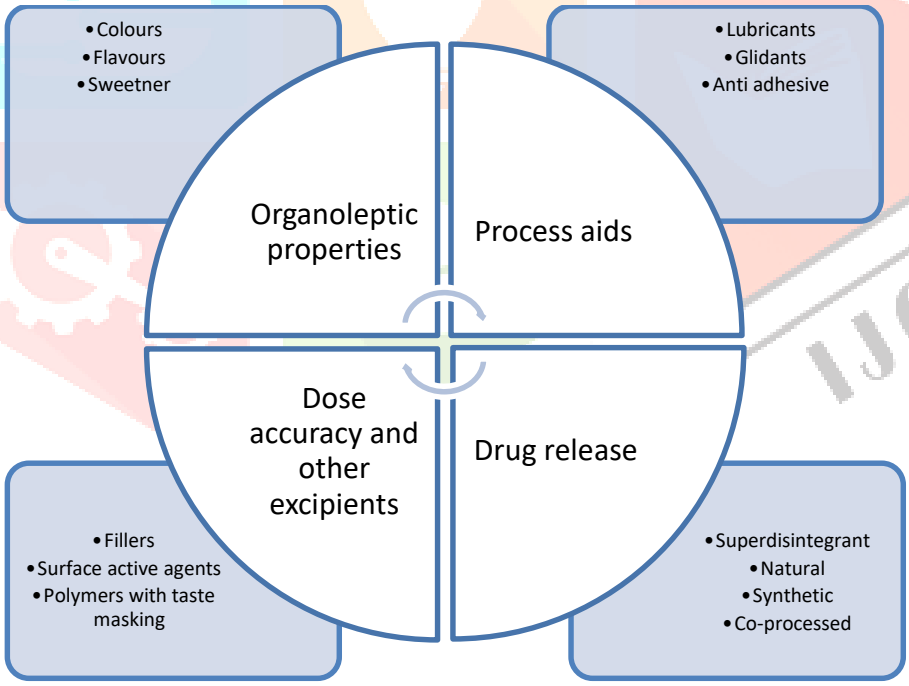
1.6 Characteristics:

• Ease of administration for uncooperative mentally or physically disabled patients.
• Water is not required for administration.
• The dosage form disintegrates and dissolves quickly.
• After administration, they may be designed to leave little or without residue in the mouth.
• Allows for excessive drug loading.
• Capacity to provide solid formulations with liquid medicinal benefits.
• Cost-effective(18) .

1.7 Advantages:

• Since the tablet can be swallowed without water, it is suitable and easy to administer.
• FDTs can be effortlessly administered to paediatric, old and patients with mental illness.
• The drug dissolves and absorbs quickly, so rapid onset of action observed.
• decrease in First pass metabolism, thus increased bioavailability and decreased dose and side effects(19).
• Patient having issues in gulping tablet can easily administer this type of dosage form.
• Compatible with taste masking(20–22).

2. Ingredients:



2.1 Superdisintegrant:

Superdisintegrants have greater mechanical strength and disintegration efficiency at lower concentrations. Superdisintegrants swell, hydrate, change the volume or form, and disrupt the tablet when they are comes in contact with water. Effective superdisintegrants improve compressibility and compatibility while having no adverse effects on formulations containing high dose drugs in terms of mechanical stability. Common examples of superdisintegrants are cross linked carboxymethylcellulose (croscarmellose), sodium starch glycolate, polyvinylpyrrolidone, and others (23).

2.2 Flavours and Sweeteners:

The undesirable taste of the tablets can be masked by adding flavours and sweeteners to make them more palatable. Sugar, dextrose, and fructose are used, and also non-nutritive sweeteners including aspartame, sodium saccharin, and sucralose(24). The addition of sweeteners contributes a pleasant taste as well as bulk to the composition (25). Peppermint flavour, cooling flavour, flavour oils and flavouring aromatic oil, peppermint oil, clove oil, bay oil, anise oil, eucalyptus soil thyme oil, oil of bitter almonds. Flavouring agents include, vanilla, citrus oils, fruit essences(26).

2.3 Diluents:

When the drug dosage by itself is insufficient to produce the required tablet bulk, diluents are the fillers used to increase the bulk of tablet. Diluents are generally used to enhance cohesiveness, permit direct compression manufacturing, or promote flow. e.g.: Mannitol, calcium carbonate, sorbitol, calcium sulfate, starch, lactitol (27).

2.4 Binder:

Binders are agent employed to impart cohesiveness to the granules. Polyvinylpyrrolidone(PVP),Polyvinylalcohol(PVA),Hydroxypropyl methylcellulose(HPMC)(28).

2.5 Colours:

Colouring agents that are commonly incorporated include FD&C approved colours, natural colours, pigments such as titanium dioxide, etc. concentration of colorants should not be used greater than 1%w/w(29). Sunset yellow, Amaranth etc (30).

2.6 Lubricants:

Lubricant is used to reduce interparticle friction and prevent the adherence of tablet materials to die and punch surface. It may also improve the flow of tablet granulation (31). Zinc stearate, calcium stearate, talc, Magnesium stearate, polyethylene glycol, liquid paraffin, magnesium lauryl sulphate, Stearic acid, colloidal silicon dioxide(32).

2.7 Glidant:

Glidant's function is to increase the powder's flowability. E.g.: Talc, starch, magnesium carbonate, silicon dioxide, calcium silicate, and magnesium oxide(33).

2.8 Antiadherent:

In order to prevent particles from adhering to the punches, antiadherent works to reduce adhesion between the powder and the punch faces. E.g. Talc, glidant, and magnesium stearate(34).

3. Challenges:

3.1 Palatability:

FDTs generally contain the drug in a taste masking form since the almost all the drugs are indigestible. After administration, release the active components that interacting with taste buds by disintegrating or dissolving the FDTs in the patient's mouth. Thus, for the patient compliance taste masking of the drugs is essential(35).

3.2 Mechanical strength and disintegration time:

To permit the breakdown of FDTs in the mouth, these are either made of very porous, soft-moulded mould or compressed into tablets with extremely low compression force, making the tablets delicate and/or breakable, challenging to handle and frequently requiring specialised peel-off blister packaging that could raise and price. WOW Tab abs Durasolv are the only two technologies that can produce tablet that are strong and hard enough to be put in multi-dose bottles(36).

3.3 Aqueous solubility:

Water-soluble drugs provide a number of formulation challenges due to the production of eutectic mixtures that lower the freezing point and result in the development of a glazed solid that may dissolve when dried due to the loss of supporting structure during the sublimation process. Using specific excipients that form a matrix like mannitol, which can improve crystallinity and provide the amorphous compound rigidity, can sometimes prevent this collapse (37).

3.4 Hygroscopicity:

When the temperature and humidity levels is normal, a number of hygroscopic orally disintegrating dosage formulations are unable to maintain physical integrity. They therefore require humidity protection, which needs for specific product packaging (38).

3.5 Amount of drug:

The usage of FDT technology is affected by the maximum quantity of drug that can be contained in each unit dose. The drug dose must be less than 400 mg for insoluble drugs and less than 60 mg for soluble drugs for lyophilized dosage forms. It can be difficult to make rapidly dissolving oral film or tablets with this characteristics (39).

3.6 Size of tablet:

According to reports, tablets that are 7-8 mm in size are the easiest to swallow, while those that are more than 8 mm are the easiest to handle. Therefore, it is challenging to manufacture tablets that are both easy to handle and easy to swallow (40).

4. Evaluation:

4.1 General appearance:

The general appearance of a tablet, its visual identity and over all elegance is essential for consumer acceptance. Size, shape, colour, odour, taste, texture of the tablet's surface, physical flaws, consistency, and legibility of any identifying markings are all considered(41).

4.2 Hardness:

Using hardness testers such as those made by Pfizer and Monsanto, among others, the tablets' hardness was tested. The amount of force needed to break the tablets is proportional to how hard they are (kg/cm2). The measured values must match the standard value(42).

4.3 Friability:

It is estimated of mechanical strength of tablets. The Roche fribilator was used to evaluate the friability tests from each batch, and it was operated at a speed of 25 revolutions per minute for 4 minutes. The tablets were removed from the apparatus, cleaned, and reweighed before the percentage of friability was determined. Friability and is communicated in rate as %Friability = (WO initial) – (Wfinal)/(WOinitial) x 100(43).

4.4 Uniformity of weight:

Twenty tablets were weighed using the IP Procedure on a digital weighing balance both individually and collectively. The total weight was used to calculate the average weight of one tablet. Calculating the uniform of the drug content could be done using the weight variation test(44).

Table No. 1: Weight variation of tablet

Average weight of the tablet	Maximum percentage difference allowed
130 or less	10
130-324	7.5
More than 324	5.0

4.5 Thickness uniformity:

It is possible to estimate each tablet's thickness using a micrometre, giving for accurate measurements and revealing the differences between them. Tablet thickness should not deviate from the standard value by more than 5%. For the product to be accepted by consumers, any thickness difference within a specific batch of tablets or between manufacturer's lots should not be visible to the unaided eye. To make packaging easier, thickness must also be controlled. The tablet's weight is determined by the tablet's physical dimensions, density of the material used in its formulation, and their proportions. The selection of tablet machine to use, appropriate granulation particle size, production lot size, appropriate tableting processing to use, packaging procedures, and production cost can also be influenced by the tablet's shape and size(45).

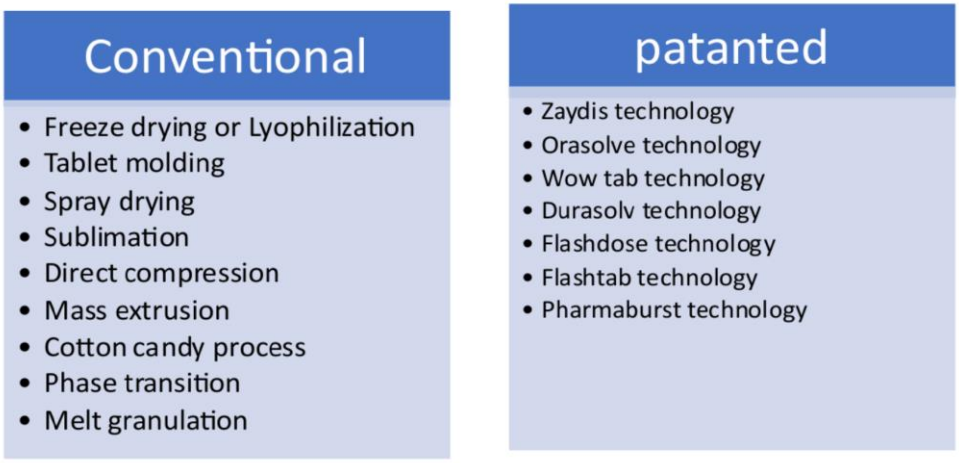
4.6 Wetting time:

Five circular tissue papers were arranged in a Petri dish with a diameter of 10 cm. 10 ml of water containing 0.5% eosin, a water-soluble dye, were added to the Petri plate. The dye solution was used to calculate how completely the tablet surface had been wet. A tablet was carefully placed on top of the tissue paper in the Petri dish at 25°C. The wetting time was defined as the time required for water to completely wet the upper surface of the tablets. Six times were repeated for these measurements. The amount of wetting was measured with the use of a timer(46).

4.7 Stability study:

Fast-dissolving tablets are packed appropriately and kept under the following circumstances for the duration of an accelerated study as directed by ICH guidelines. • 40 ± 1°C • 50 ± 1°c • 37 ±1°C and RH 75% ± 5% After 15 days, the tablets were removed and their physical characteristics (such as visual defects, hardness, friability, disintegrations, etc.) and drug content were analysed. To determine the kinetics of degradation, the collected data is fitted into first order equations. To calculate the shelf life at 25°C, accelerated stability data are shown using the Arrhenius equation (47).

5. Technologies



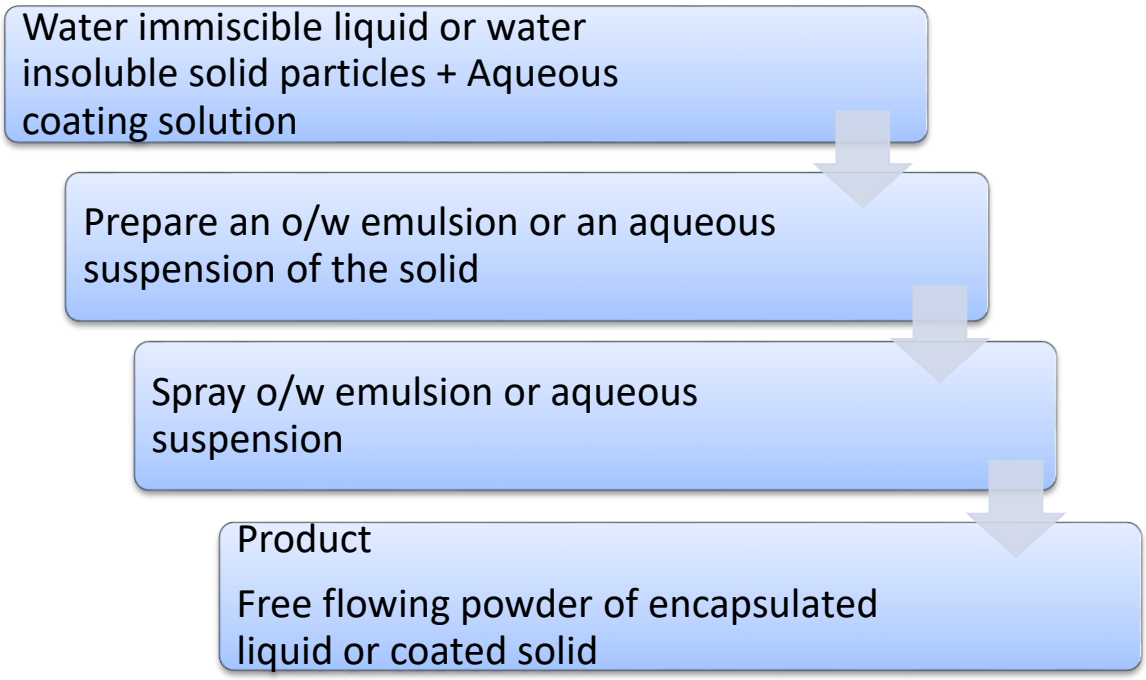
5.1 Conventional technologies:

5.1.1 Freeze drying /Lyophilisation:

Freeze drying is a procedure in which water sublimates from the substance once it was completely frozen. Freezedried structures offer more quick disintegration than other accessible strong items. The lyophilisation interaction confers shiny nebulous design to the building specialist and multiple times to the medication, subsequently improving the disintegration attributes of the plan. The impact of different detailing and cycle boundaries on the qualities of quickly deteriorating tablets in freeze dried structure was explored by Corveleyn and Ramon who reasoned that maltodextrins are valuable in the definition of quick dissolving tablets made by freeze drying(48).

5.1.2 Spray drying:

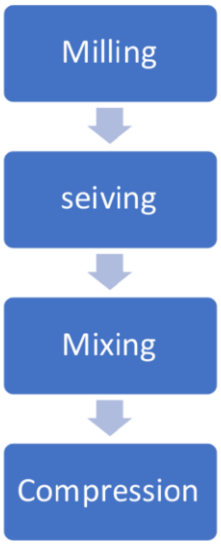
In this procedure, gelatine can be utilized as a supporting specialist and as a lattice, mannitol as a building specialist and Superdisintegrants include sodium starch glycolate, croscarmellose, and crospovidone. Tablets produced from the splash dried powder have been accounted for to break down in below 20 seconds in watery medium. This splash dried powder, which packed into tablets showed fast deterioration and improved disintegration. Most extreme medication delivery and least deterioration time were seen using the base of Kollidon CL excipient when contrasted with tablets arranged by direct pressure, showing the predominance of the splash dried excipient base strategy over direct pressure method(49).



5.1.3 Direct compression:

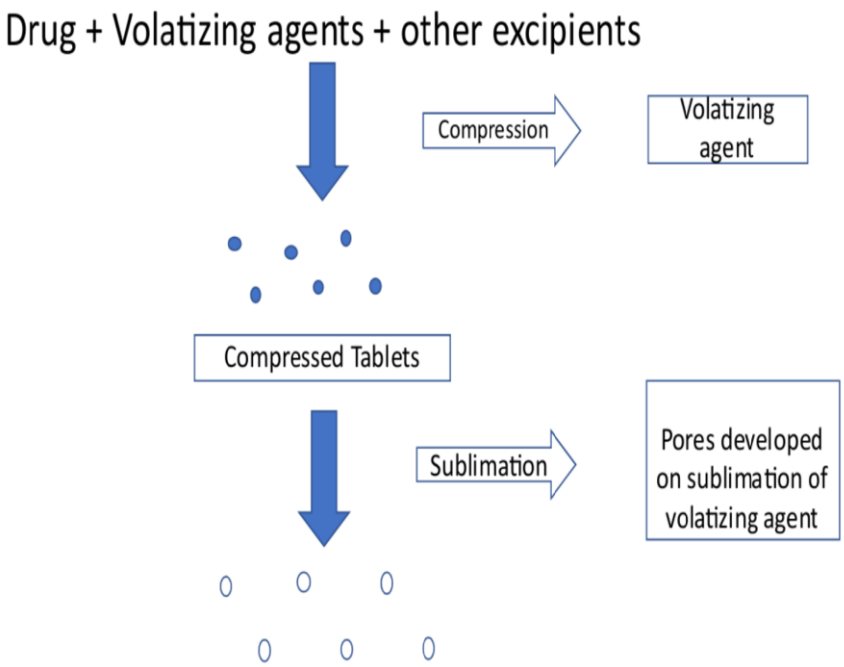
The direct compression is the most favoured procedure for producing the tablets because of following benefits:
• High amounts may be required, and the tablet's final weight may be greater than that of other techniques.
• The simplest and favoured method for manufacturing the tablets.
• Most common equipment and regularly available excipients are used.
• Only a few processing steps are required.
• Economical.

The size of tablet and hardness strongly influence the disintegrant efficacy. Hard and enormous tablets required maximum disintegration time than regularly required. Tablets which are delicate and small have low mechanical strength. The proper type and concentration of disintegrant should be employed to ensure quick disintegration and high dissolution rates. The disintegration time remains constant or even increases over the critical concentration level(50).



5.1.4 Sublimation:

The preparation contains volatile ingredients and is then exposed to a sublimation procedure to produce a porous matrix. In addition to other excipients, chemicals such as urethane, camphor, urea, ammonium bicarbonate, ammonium carbonate, naphthalene, benzoic acid, and phthalic anhydride can be compressed into a tablet. Sublimation is then used to remove this volatile material, leaving behind a very porous matrix. The duration required for disintegration of tablets made using this method has been reported to be between 10 and 20 seconds. As pore-forming agents, even solvents like cyclohexane and benzene can be utilized(23,51).



5.1.5 Cotton candy:

This technique gets its name from the special spinning mechanism it uses to create a crystal structure that resembles floss and tastes like cotton candy. During the spinning and flash melting phases of the cotton candy process, it produces a matrix of saccharides or polysaccharides. The matrix create is partially recrystallized porous form. They possess a porous nature and may be treated with solvents like cyclohexane and benzene, which are sublimation process characteristics(52).

5.1.6 Moulding

Moulded tablets are comprised of hydrophilic compounds. A solvent is sprinkled over the powder mixture (normally water or ethanol). Under pressure, the mixture is moulded into tablets. Applied pressure ought to be lower than those used in traditional tablet compression. This process is too known as compression moulding. Air drying can be used for removal of solvent. Due to lower pressure; a profoundly permeable structure is made, that improves the dissolution. To speed up dissolving, the powder mixture needs to pass through an extremely fine screen for filtration. Due to the high water-soluble, sugar components in moulded tablets, they decomposed more quickly and developed further. Moulded tablets, however, usually don't have a high mechanical strength. When handling and opening blister pockets for tablets, there is a very high risk of breaking the moulded tablets. The disintegration rate is reduced when a hardening agent is added to the formulation. By using non-conventional equipment and multistep processes, mechanical strength and increased tablet disintegration can be improved (53,54).

5.1.7 Phase transition:

This procedure uses erythritol (melting point 122 °C), xylitol (93-95 °C), trehalose (97 °C), and mannitol (166 °C) to phase-transition sugar alcohols to disintegrate FDTs. Two sugar alcohols with different melting points were combined in a powder, compressed, and heated to a temperature between their m.p to form tablets. The tablets insufficient hardness before heating is a result of their incompatibility. Tablet hardness increased after heating due to an increase in interparticle bonds or bonding surface area produced by the phase transition of lower m.p sugar alcohol(55).

5.1.8 Melt granulation:

Using the melt granulation process, a meltable binder effectively agglomerates pharmaceutical powders. The lack of water and chemical solvents are beneficial to this method over to conventional granulation. The procedure is faster as a result of the lack of a drying stage and required low energy than wet granulation. It is a useful technique to facilitate the disintegration of drug like griseofulvin, which aren't very water soluble. A hydrophilic waxy binder (Superpolystearate, PEG-6-stearate) is used in this process to make fast dissolving tablet with adequate mechanical strength. Because it dissolves in the mouth and dissolves quickly without leaving any residues, in addition to serving as a binders and increasing the physical strength of tablets, it will therefore make it easier for the tablets to disintegrate(56).

5.1.9 Mass extrusion:

To soften the active mixture, a solvent solution of methanol and water-soluble polyethylene glycol is used. Then the soften massed is released through an syringe or extruder to divided a cylinder of the drug into even segments so that heated blades can make tablets. To alter the taste of drug granules, They can also be coated with a bitter taste using the dried cylinder(57).

Drug + Excipients are blended well ⟶ the blend is soften using solvent mixture (e. g hydrophilic polyethylene glycol, methanol ⟶ The soften mass is then extruded via an excreter or syring ⟶ These is excredes cut into even segment via heated blades to obtains tablets ⟶ Then the tablets are coated to taste mask the bitter test and packaged.

5.2 Patented technologies for fast dissolving tablet:

5.2.1 Zaydis Technology:

This is a special freeze-dried tablet in which the physical drug entrapment or dissolution within matrix of a quickly dissolving carrier material. The freeze-dried structure instantly disintegrates after oral Zaydis units have been administered; no water is necessary for swallowing. The Zaydis matrix is made up of a various type of materials that are intended to accomplish a number of objectives. To enhance resilience and strength while handling, polymers like alginates, dextran, or gelatine are added. These have a glossy amorphous structure that gives off strength(58).

5.2.2 Orasolv technology: The orasolv technology uses effervescence material to produce tablets under minimum compression pressure. Orasolv technology use conventional manufacturing equipment. When the dosage form comes into contact with saliva or water, the effervescence ingredient causes the dosage form to quickly disintegrate. An acid source and a carbonate source make up the common effervescence disintegration pair. Malic, tartaric, fumaric, adipic, and citric acids are among the sources of acids. Sodium, potassium, and magnesium bicarbonates are among the sources of carbonates. The carbon dioxide evolved from the reaction (occurred between acid and carbonate) may provide some fizzing sensation like positive organoleptic sensation. However, modern technology modifies this idea in order to create fast-dissolving dosage forms(59).

5.2.3 Wow tab technology: The wow in wow tab denotes that the tablet should not be administered with water. This method allows use of excipients that like sugar and sugar. The two various saccharides are mix to form a tablet formulation with the Sufficient amount of hardness and quick disintegration. Saccharides with low moldability includes lactose, glucose, mannitol, and xylitol (rapid dissolution), while high moldability saccharides include maltose, mannitol, sorbitol, and oligosaccharides (excellent binding properties) Until they come into contact with moisture, such as saliva in the mouth, tablets made with this technique will keep the physical characteristics of the dosage type for during manufacturing. The wow tab formulation is highly environmentally stable than Zaydis and Orasolv due to its remarkable hardness. The appropriate sugar for this kind of formulation was discovered to be erythritol, which exhibits quick disintegration that is unaffected by tablet hardness (60).

5.2.4 Durasolv technology:

It is a patented invention of CIMA LAB (US patent no. 6,024,981) and is based on direct compression technology. Superdisintegrants, which quicken the disintegration rate and consequently dissolution, are used as suitable excipients with improved properties. This approach is depending on the use of common non-direct compression fillers (such as dextrose, mannitol, sorbitol, etc.) that dissolve rapidly without producing a gritty or sandy taste in the mouth. It is also able to to utilize substances that are water soluble and sometimes effervescent agent can also assist in the process of disintegration. With no special packaging requirements, stronger tablets made with the DuraSolv® technology can be blister-packed. With this method, the tablet is composed of fillers, lubricants, and drug components(61).

5.2.5 Flashdose technology:

Three ODD methods from Fuisz Technologies are based on quick dissolution. FDTs soft chew and EZ chew, the first two generation must be chewed. And these prepared the way for Flash Dose, the most recent Fuisz development. The Flash Dose technique creates crystalline structure like floss that resemble cotton candy using a special spinning mechanism. The active medication can then be added to this crystalline sugar, which can subsequently be compacted into a tablet. Fuisz has patented this process, which is referred to as Shear form. The finished product has a huge surface area for dissolution. After the tablet is placed on tongue, it quickly disperses and dissolves. It's interesting to note that throughout manufacture, the temperature and other factors can significantly change the product's qualities. To convey the drug, small saccharide spheres can be created as an substitute to floss-like materials. As a different approach to taste masking, Fuisz has patented the production of microspheres under the term CEFORM1(62).

5.2.6 Flash tab technology:

These is a different fast-dissolving/fast-disintegrating tablet formulation. Prographarm laboratories have a patent on the Flash tab technology. Most of the excipients used are identical to those used in traditional compacted tablets. This formulation makes a tablet that solubilize in the mouth within a minute by mixing coated drug particles with a dissolving and a swelling substance (63).

5.2.7 Pharmaburst technology:

SPI Pharma has patented the "Quick Dissolve" delivery technology known as PharmaburstTM. Pharma burst is a co-processed excipient system that uses particular excipients to enable quick disintegration and low adhesion to punch faces moldability saccharine are used to produce rapid melting strong tablets. saccharides with limited moldability are combined with the active component(64).

5.2.8 Frosta technology:

This innovation is patent by Akina. It makes use of the concept of preparing plastic granules, compressing them with minimum pressure, and creating hard tablets with a significant of porosity. Granules of plastic that are composed of a binder, a porous plastic substance, and a water penetration enhancer. The porous plastic substance is mixed with a water penetration enhancer before being crushed into granules with a binder. According to size of tablet, the produced tablets exhibit excellent hardness and a quick disintegration duration of 15 to 30 seconds (51).

5.2.9 Nanocrystal technology:

Fast-dissolving tablets can be produced using Elan's proprietary nanocrystal technology, which also improves the characteristics of the final product and the drug activity. Rate of disintegration increases due to surface area of particle decreases. Nanocrystal technology makes this possible consistently and effectively. Small drug material particles known as nanocrystals—normally below 1000 nm in diameter—are produced when the drug ingredient is processed using a specialised wet milling method(65,66).

5.2.10 Quick-dis technology:

According to KV Pharmaceutical, its Micro Mask microsphere technology has a better mouth feel than comparable taste-masking products since there are no solvents required in the taste-masking procedure, production is faster and made more effective. Since OraQuick produces less heat than alternative fastdissolving/disintegrating technologies, it is appropriate for drugs that are heat sensitive. According to KV Pharmaceutical, the matrix that envelops and prevent the drug powder in more pliable microencapsulated particles, facilitating compression of tablets to significantly increase mechanical strength without affecting taste masking. OraQuick claims quick dissolving in a short duration and good taste masking. Although OraQuick-based products are not yet available on the market, KV Pharmaceutical is working on scheduled drugs, cough and cold medicines, analgesics, psychotropic drugs, and antibiotics(67).

5.2.11 Sheaform technology:

This technology is depending on the making of floss, also known as "Shear form Matrix," which is made by flash heating feedstock that contains a sugar carrier. During this procedure, the sugar is simultaneously centrifugal force is applied and a temperature gradient that elevates the mass's temperature and creates an internal flow condition that allows for some of the sugar to move relative to the mass. Since the floss produced in this form is naturally amorphous, it is further diced and recrystallized using a number of methods to give it aciform flow characteristics and facilitate blending. The re-crystallized matrix is subsequently combined with an active component and additional tablet excipients(68).

5.2.12 Lyoc:

Farmlyoc has patented the technology known as Lyoc. Through lyophilisation, the approach attempts to produce an oil-in-water emulsion that is then placed into the blister alveolus as a solid and porous galenic. This emulsion paste is then placed in a blister with bulk drug or drug microparticles and frozen. Due of its porosity, Lyco products possess minimal mechanical stability but good disintegration rates. The product Phloroglucinol Hydrate-Farmlyco is an example. While Lyoc also uses freeze drying, it differs from Zaydis in that the product is frozen on the shelves of the freeze drier. The viscosity of the in-process suspension must be increased in these formulations significantly by undissolved inert filler (mannitol) in order to reduce inhomogeneity by sedimentation during this process. Making the tablets by direct compression of a powdered mixture with external lubricant(69).

6. Marketed Products

Table No. 2: List of commercially available fast dissolving tablets(5,70,71)

Trade name	Active drug	Manufacturer
Zofran ODT	Ondansetron{Bibliography}	Glaxo Smithkline
Feldene Fast Melt	piroxicam	Pfizer Inc.,NY,U.S.A
Romilast	Montelukast	Sun Pharmaceutical Pvt.Ltd.,New Delhi
Febrectol	Paracetamol	Prographarm, Chateanueuf,France
Nimulid MDT	Nimesulide	Pancea Biotech , New Delhi, India
Pepcid RPD	Fomatidine	Merck and Co.,NJ,U.S.A
Zelapar TM	Selegiline	Amarin Corp.,Londen,UK
Mosid MT	Mosapride Citrate	Torrent Pharmaceuticals Ltd., Ahmedabad,India
Torrox MT and Zyrof Meltab	Rofecoxib	Torrent Pharmaceuticals Ltd.,Ahmedabad, India and Zydus,Candila,India
Benadryl Fast melt	Diphenhydramine and Pseudoephedrine	Warner Lambert,NY,USA
Claritin redi Tab	Loratidine	Schering Plough Corp.,USA
Olanex instab	Olanzapine	Ranbaxy lab. Ltd. New-Delhi,India
Maxalt MLT	Rizatriptan	Merck and Co., NJ ,USA
Zyprexia	Olanzapine	Eli lillly, Indianapolis,USA
Zoming-ZMT	Zolmitriptan	Astrazeneca, Wilmington,USA

CONCLUSION

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. FDTs are disintegrating or dissolve quickly in the saliva without a need of water. Fast dissolving tablets are designed to dissolve in saliva remarkably faster, within a few seconds (less than 60 seconds), and those are real fast-dissolving tablets. FDTs formulations contain super disintegrants to enhance the disintegration rate of a tablet in the buccal cavity. FDTs have advantages such as easy portability and manufacturing, accurate dosing, good chemical and physical stability and an ideal alternative for geriatric and pediatric patients. FDTs have disintegrated quickly, absorb faster so, in vitro drug release time improve and this property of drugs (dosage form) enhanced bioavailability. FDT formulations have the advantage of both conventional tablet formulation and liquid dosage form. Other groups that may experience problems using conventional oral dosage forms include the mentally ill, the developmentally disabled, and patients who are uncooperative, on reduced liquid-intake plans, or are nauseated. In some cases, such as motion sickness, sudden episodes of allergic attack or coughing, and an unavailability of water, swallowing conventional tablets may be difficult.

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