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RECENT TECHNOLOGY ON RAPIMELT TABLETS OF ANTI HYPERTENSIVE DRUGS

Pharmaceutical Science

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ABSTRACT

Rapimelt tablets oral drug delivery is currently the gold standard in the pharmaceutical industry where it is regarded as the safest, most convenient and most economical method of drug delivery having the highest patient compliance. Methods to improve patient's compliance have always attracted scientists towards the development of fancy oral drug delivery systems. Among them, Rapimelt tablets drug delivery systems (RmDDS) have acquired an important position in the market by overcoming previously encountered administration problems and contributing to extension of patent life. (RmDDS) have the unique property of rapidly disintegrating and/or dissolving and releasing the drug as soon as they come in contact with saliva, thus obviating the requirement of water during administration. Therefore, these dosage forms have lured the market for a certain section of the patient population which includes dysphagic, bed ridden, psychic, and geriatric and paediatric patients. Research in developing repadily disintegrating systems has been aimed at investigating excipients as well as technique to meet these challenges. Technologies used for manufacturing of Rapimelt tablets are either conventional technologies or patented technologies. In conventional freeze drying, tablet molding, sublimation, spray drying etc. and in patented Zydis technology, Orasolv technology, Durasolv technology, Wowtab technology, Flashdose technology are important. Important ingredients that are used in the formulation of ODTs should allow quick release of the drug, resulting in faster dissolution.

KEYWORDS

(RmDDS), Rapimelt tablets, Oral delivery, Fast dissolving Tablet

INTRODUCTION

Worldwide hypertension is one of the common causes of cardiovascular disease[1]. It is a disorder of major clinical, public health and economic importance. It is a common cause for visiting physicians all over the world. One good thing about it is that if it is diagnosed at early stage, disease can be managed with lifestyle modifications[2]. But negative thing about it is that person does not experience any obvious symptoms with this disease so most of the time diagnosis occurs at later stage of the disease. In India adolescent and young age population is more, it is a nation of youth3. Today average age at which a person may experience a heart attack has come down from 40 years to 30 years. The justice for this scenario in Indian community is today's changing lifestyle.

Hypertension (HTN) is considered one of the leading causes of increased cardiovascular disease. Lowering blood pressure does reduce cardiovascular risks; maintaining systolic blood pressure of less than 130 mm Hg demonstrably prevents4. Complications in patients with heart failure, diabetes, coronary artery disease, stroke, and other cardiovascular diseases. This activity discusses the guidelines for selecting the appropriate antihypertensive medications. It presents the different classes for first[5], second and third-line treatments for hypertension and highlights the indications and side effects. It highlights the studies done to compare different classes of antihypertensive medications and indications for each class.

Rapimelt tablets are novel drug delivery system that dissolves, disintegrate or disperse the API in saliva within few seconds with or without intake of water[6]. The faster the dissolution of drug into the solution, quicker is the absorption and onset of clinical effect. The bioavailability of some drugs may increase due to absorption of drugs in oral cavity or also due to pregastric absorption of drug from saliva that pass down into the stomach[7]. Natural and synthetic Superdisintegrants like mucilage cross linked carboxymethyl cellulose (croscarmellose) and sodium starch glycolate (primogel), poly vinyl pyrollidone provide immediate disintegration of tablets and facilitate the design of delivery system with desirable characterstics[8]. These types of formulations are widely recommended for the drugs used in emergency. e.g., Cardiac agents, Asthma, Brain stroke, Anti-hyper-lipidemic etc.

Rapimelt the US FDA Centre for Drug Evaluation and Research (CDER) defines, in the 'Orange Book', a rapimelt as “A solid dosage form containing medicinal substances, which disintegrates rapidly, usually within a matter of seconds, when placed upon the tongue”. The significance of these dosage forms is highlighted by the adoption of the term, “Rapimelt”, by the European Pharmacopoeia which describes it as a tablet that can be placed in oral cavity where it disintegrate rapidly before swallowing[9]. Rapimelts are distinguished from conventional sublingual tablets, buccal tablets, and lozenges, which require more than a minute to disintegrate in oral cavity. In the literature, rapimelts are also called Fast disintegrating tablets[10] are also known as “Fast-dissolving”, “Mouth-dissolving”, “Rapid-dissolve”, “Quick-disintegration”, “Orally-disintegrating”, “Rapimelt”, “Fast-melt”, “Orodispersible”, “Melt-in-mouth”, “Quick-dissolving”, “Porous tablets” and “Effervescent drug absorption system”. the function and concept of all these dosage forms are similar. It is a tablet that disintegrates and dissolves rapidly in the saliva, within a few seconds without the need of drinking water or chewing. A rapimelt usually disintegrate in the oral cavity within 15 s to 3 min. Most of the rapimelts include certain superdisintegrants and taste masking agents. This mode of administration was initially expected to be beneficial to paediatric and geriatric patients, to people with conditions related to impair swallowing, and for treatment of patients when compliance may be difficult. The main purpose of this work is only to improve patient compliance without compromising the therapeutic efficacy 9,10.

During the past decade, the FDT technology makes tablets dissolve or disintegrate in the mouth without additional water intake, has drawn a greater deal of attention. The tablets disintegrate into smaller granules or melt in the mouth from a hard solid structure to a gel like structure, allowing by patients. The disintegration time for those tablets varies from a few seconds to more than a minute.

Advantages

- Easy to administer to the patient who cannot swallow such as paediatric, geriatric, etc.
- Convenient for administration to travelling patients.
- Excellent mouths feel property produced by use of flavours and sweeteners help to change the perception of “medication as bitter pill”especially in paediatric population.
- Rapimelt tablets leads to quick disintegration and rapid absorption which may produce rapid onset of action.
- Rapimelts offer all the advantages of solid dosage forms and liquid dosage forms.
- Convenience of administration and accurate dosing compared to liquids.

Disadvantages

- Effective taste masking technologies should be adopted for bitter taste drugs.

- Degradation of drug can take place in highly enzymatic environment. It has relatively small surface area.
- There is risk of choking or swallowing of formulation.
- Rapimelt's exhibit low sensitivity to environment condition such as humidity and temperature.
- If you are allergic to zolmitriptan or any of the other ingredients of this medicine If you have high blood pressure.
- If you have ever had heart problems, including a heart attack, angina (chest pain caused by exercise or effort), Prinzmetal's angina (chest pain which happens at rest) or have experienced heart.
- If you have had a stroke or short-lasting symptoms similar to stroke (transient ischaemic attack or TIA).
- If you are at the same time taking some other medicines for migraine (e.g. ergotamine or ergottype medicines like dihydroergotamine and methysergide) or other triptan medicines for migraine. See 'other medicines and Rapimelt' for further information.

Do not take Rapimelt if any of the above applies to you. If you are not sure, talk to your doctor or pharmacist before taking Rapimelt.

Characteristics of FDTs

Rapid-breakdown or Rapimelt tablet of the type of those intended to undergo disaggregation in the mouth in contact with the saliva in less than 60 seconds, preferably in less than 40 seconds, forming a suspension which is easy to swallow. It is better known by the phrase "orodispersible tablets". It is estimated that 50% of the population has difficulties in swallowing tablets or capsules. This problem results in the prescribed medicament not being taken and hence in the efficacy of the treatment being severely affected[11]. So orodispersible tablets are easy administration for patients who have problems of deglutition or for those persons who would like to take their treatment without simultaneous ingestion of liquid.

Recent advances in novel drug delivery (NDDS) aims to enhance safety and efficacy of drug molecule by formulating a convenient dosage form for ease of administration and to achieve better patient compliance. One such approach is oral disintegrating tablets (ODTs). ODTs are solid unit dosage forms[12], which disintegrates or dissolves rapidly in the mouth without the general requirement for swallowing, the chewing and water. Developments in the dosage form designing the ODTs fulfill the requirement of patient needs without compromising its efficacy. The ODTs satisfies the patient's requirements that are difficulty in the swallowing of the conventional tablets or capsules[13]. Basic properties are listed in following table.

Salient Feature of Fast Dissolving Drug Delivery System:

- Patient Compliance is easy and the administration of tablet especially for patients suffering from dysphagia, cardiac and renal complications/victims[14], bedridden patients, and patient who refuse to swallow the dosage form such as pediatric, geriatric & psychiatric patients.
- Oral disintegration of tablet eliminates the use of water which is suitable for patients who are traveling and cannot access water easily.
- Quick onset of action due to rapid disintegration followed by dissolution. Increased Bioavailability, due to absorption via mouth buccal mucosa which has better permeability properties[15].
- Pregastric absorption if any will result in improved bioavailability reduced dose and side effects, improving clinical efficiency.
- The FDT will give a good mouth feel, especially in pediatric patients due more emphasis on organoleptic properties.
- FDT will be safer than conventional dosage forms as it eliminates choking, or airway obstruction.
- Better business opportunities like, product differentiation, product endorsement, patent extensions and life cycle management[16].
- Favorable in cases which require an immediate and rapid onset of action e.g. motion sickness, sudden episodes of allergic attack or coughing. Dual advantage of solid (higher stability) and liquid (better bioavailability) dosage forms[17].

Techniques for Preparing Fast Dissolving Tablets

Many techniques have been reported for the formulation of Fast dissolving tablets or Orodispersible tablets. Here we have discussed the six major techniques which are widely used for the formulation of these tablets[18].

1. Sublimation
2. Spray drying
3. Tablet moulding
4. Freeze drying/Lyophilisation
5. Direct Compression
6. Superdisintegrants
7. Sugar Based Excipients
8. Mass Extrusion

Sublimation

Incorporation of volatile ingredients to generate a porous mixture is subjected to a process of sublimation[19]. Highly volatile ingredients like benzoic acid, ammonium bicarbonate, ammonium carbonate, camphor, naphthalene, urea, phthalic anhydride and urethane may be compressed along with other excipients into a tablet. By process of sublimation this volatile material is then removed, leaving behind a highly porous matrix. Tablets manufactured by this technique have reported to usually disintegrate within 10-20 sec. Solvents like benzene; cyclohexane can be used as pore forming agents [20].

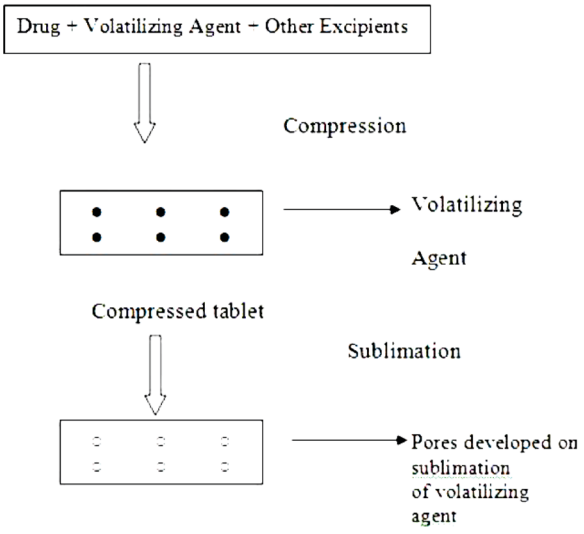

Figure 1: Steps Involve in Sublimination Technique

Spray Drying

In this technique, gelatin is used as a matrix and a supporting agent, mannitol as bulking agent, and superdisintegrants like crosscarmellose or sodium starch glycolate or crospovidone[21]. The Tablets manufactured from the spraydried powder containing bulking agent, superdisintegrant and acidic ingredient (citric acid) and/or alkaline ingredients (e.g. sodium bicarbonate) have been reported to disintegrate in within 20 seconds in aqueous medium. This spray-dried powder, compressed into tablets showed quick disintegration and improved dissolution.

Tablet Molding

Molding process is of two type's i.e. solvent method and heat method. The tablets manufactured by solvent method are less compact than compressed tablets and posses a porous structure that hastens dissolution[22]. The mechanical strength of moulded tablets is a matter of great concern. Binding agents, which improve the mechanical strength of the tablets, need to be incorporated. Masking of taste is an added problem to this technology and the masked drug particles are prepared by spray congealing a molten mixture of hydrogenated polyethylene glycol, cottonseed oil, lecithin, and sodium carbonate an active ingredient into a lactose based tablet triturate form. Tablets produced by the moulding technique are easy to scale up for industrial manufacturer, compared to the lyophillisation technique[23].

Freeze-Drying or Lyophillisation

Freeze drying is the process in which water is sublimed from the product after it is frozen. This technique creates an amorphous porous structure that can dissolve rapidly. A typical procedure involved in the manufacturing of FDT using this technique is mentioned here[24].

Direct Compression: Direct compression represents the most cost effective and simplest tablet manufacturing technique. Because of the accessibility of improved excipients especially superdisintegrants and sugar based excipients, this technique can now be utilized for

preparation of Fast Dissolving Tablets[25].

Superdisintegrants: Superdisintegrants are the principally affecting disintegration and ultimately dissolution of the fast dissolving tablets, mainly for direct compression techniques[26]. The presence of other ingredients such as water-soluble excipients and effervescent agents further hastens the disintegration process.

Sugar Based Excipients: This is another route to approach the direct compression technique. The use of sugar based excipients especially bulking agents like lactilol, dextrose, isomalt, fructose, maltilol, maltose, mannitol, sorbitol, polydextrose, xylitol, and starch hydrolysate which display high aqueous solubility and sweetness, and hence impart taste masking property and a pleasant mouth feel[27]. Mizumito et al have categorized sugar-based excipients into two types on the basis of molding and dissolution rate. Type 1 saccharides (mannitol and lactose) exhibit low mould-ability but high dissolution rate. Type 2 saccharides (maltilol and maltose) exhibit high mould-ability and low dissolution rate[28]

Mass-Extrusion: In this technology the active blend is soften using the solvent mixture of water-soluble methanol and polyethylene glycol and subsequent expulsion of softened mass through the extruder or syringe to get a cylinder product and is divided into even segments using heated blade to form tablet. The dried cylinder can also be used to coat granules for bitter drugs and thereby achieve taste masking[29].

Patented Technologies For Fast Dissolving Tablets

Zydis Technology Zydis formulation is a unique technology of preparing fast dissolving tablet. It is freeze dried tablet technology in which drug materials are physically entrapped or dissolved within the matrix of fast dissolving carrier materials[30]. Water is not required for swallowing because when "zydis unit" is put in mouth then the freeze dried structure disintegrates rapidly. Zydis material is composed of so many substances to achieve a number of objectives. To provide strength during handling polymers such as dextran, alginate and gelatin are incorporated. Saccharides such as sorbitol or mannitol are incorporated to obtain good elegance, hardness and crystallinity[31]. To prevent the shrinkage of "zydis unit" during freeze drying process or long term storage glycine is generally used as collapse protectants. To protect the formulation from the moisture it should be packed in a blister.

Durasolv Technology

It is patented technology of CIMA LAB(US patent no.6,024,981) and is based on direct compression technology which uses suitable excipients with improved properties, especially superdisintegrants[32] that accelerate the rate of disintegration and hence dissolution.This technology is based on employment of conventional non-direct compression fillers (such as dextrose, mannitol, sorbitol etc) in the form of fine particles that quickly dissolve without producing a gritty or sandy sensation in the mouth[33]. The water soluble and sometimes effervescent agents can also be use that assist in the disintegration process. The DuraSolv® technology is designed to provide stronger tablets without packaging precautions and can be packed in blisters[34]. In this technology the tablet consists of drug materials, lubricants and fillers.

Orasolv Technology CIMA LAB has developed Orasolv technology. Orasolv is an effervescent direct compression tablet that disperses in mouth's saliva with the aid of almost hardly noticeable effervescence and dissolves in less than one minute, leaving the coated drug powder[35]. The unpleasant flavor of the drug is addressed by coating of the drug powder and effervescence. The major disadvantage of Orasolv is its mechanical strength due to light compression. In Flash dose technology the matrices are prepared by flash heat processing. This technique is patented by fuisz. E.g. Nurofen is the first commercial product by this technology launched by Biovil Corporation.

Wow Technology It is patented by Yamanouchi Pharmaceutical Corporation where wow tends for "without water". In this process high mouldability saccharide like oligosaccharide, mannitol is mixed with low mouldability[36] saccharide like glucose, lactose and mannitol to obtain rapidly melting strong tablet.

Shearform Technology: The core of this technology is preparation of floss. Floss is prepared by subjecting feed stock containing sugar carrier to flash heat process. Sucrose plus either mannitol or dextrose is mixed with surfactant and blended well. This is the primary floss mixture. In flash heat process[37], the carrier materials show an internal flow condition, which is heat induced and exits via spinning head, and simultaneously under centrifugal force, the floss is flinged.The floss produced by the above way are longer fibers and are further chopped converting them into smaller particles via a high shear mixer granulator. Recrystallization is completed by use of ethanol treatment (1%), spraying out floss, which subsequent evaporation, which increases flow and cohesive properties[38]. This recrystallized matrix is then mixed with drugs and other excipients and subjected to compression. Tablets produced by this process are highly porous, have a good mouth feel, and have an immediate solubilisation of sugar as it comes in contact with saliva.

Flashdose Technology: This technology is much like cotton candy, using a unique spinning mechanism to produce crystalline floss structure. The drug can then be incorporated into this crystalline sugar and compressed into a tablet. Such product has a high surface area for dissolution, dissolving rapidly on tongue and easy dispersion[39]. The Flash dose tablets consist of self–binding shear form matrix termed as "floss".

Ceform Technology: The crux of this process is placing a dry powder containing pure drug and excipients into a rapidly spinning machine[40]. Centrifugal force of the rotating head of this ceform machine, through small heated opening at high speed blends dry drug powder. This drug blend is liquefied to form a sphere, owing to the microburst of heat attained by carefully controlled temperature[41]. This does not affect the stability of the drug. In the preselected oral dosage format the microspheres are blended and/or compressed.

Flashtab Technology: This technology aims to make the drug have rapid release in GIT, micro encapsulated drug with effervescence, and easily flash dispersal tablet. Usually the polymer used is Eudragit for rapid release. This technology uses conventional approach of wet/dry granulation follow by classical method of compression[42]. Micro-granules of drug, taste masking agents, disintegrating agent, and swelling agents are used to formulate drugs. These tablets have good physical resistance, and highly suggested for hygroscopic materials for blister packing as materials like polyvinyl chloride/aluminum foils cater better moisture protection in comparison to conventional polyvinyl chloride or polypropylene foils[43].

Nanocrystal Technology

The technology enhances dissolution rate by decreasing particles size and increasing surface area. Nano-crystal particles are drug particles (less than 1000 nm in diameter), produced by milling the drug substance, and obtained via wt. milling technique. Nanocrystal fast dissolving technology provides, Wide range of doses per unit (up to 200 mg of API per unit), Based on proprietary and patent-protected technology elements products can be well classified. Enhanced Pharmacokinetics of oral drug[44]. Utilization of non-moisture sensitive in actives, and is economic and Cost-effective. Combining drug Nano crystal colloidal dispersions and water-soluble GRAS (Generally Regarded as Safe) ingredients, then filled into blisters, and lyophilized product wafers are formed. They are highly robust, yet dissolve in very small quantities of water in seconds., which is agreeable when working with highly potent or hazardous materials reducing operations, like granulation, blending, andtableting. This approach is also enables small quantity of drugs to be converted into fast dissolving tablets because manufacturing loss is negligible[45].

Advantol 200

Specially formulated for nutraceutical applications Advantol 200 is a directly compressible excipient system offering "Soft-Melt" functionality and it requires no special manufacturing equipment or tooling[46]. To make robust "softmelt" tablets it requires standard rotary tablet press with standard tooling under normal tableting temperature and humidity conditions.

Advatab

AdvaTab™ technology (Eurand) designed and patented by Kyowa Hakko Kogyo (Tokyo, Japan) produces orally dissolving tablets based on a proprietary tablet composition[47]. Via spray during the production process, each tablet is well lubricated. AdvaTab™ is produced using 10–30 times less hydrophobic lubricant and can be 30–40% stronger than conventional tablets.

This results in tablets being –

- Hard and durable, yet allows easy wetting upon contact with saliva
- High drug loading
- Coated drug particles for better mouth feel
- Not require special packaging, and can be packed in conventional packaging systems (push-through blisters and bottles)
- Unique as it can be paired with Eurand's technologies like Microcaps (taste-masking) and Diffucaps(controlled release)

Frosta Technology: The heart of this technology is producing strong tablets with high porosity via, compression of highly plastic granules at low pressures forming a fast melting tablet. These plastic granules can be classified into three units: a porous and plastic material, enhancer of water penetration[48], and a binder. A porous, plastic material is water soluble or water dispersible. The inter-particle contacts which is vital to form bonds between particles is improved by plastic deformations of powders. If a porous and plastic material is polymeric,. When it comes in contact with the aqueous media it is crucial to avoid formation of a viscous layer of the material at the tablet surface[49]. One way of making such tablets is to mix porous, plastic material with a water penetration enhancer at certain ratios. To prevent formation of a viscous layer on the tablet surface, the porous and plastic particles are separated by water-penetration-enhancing particles, The produces FDTs with desired hardness and fast disintegration time (2 seconds - 30 seconds) depending on the tablet size[50].

Ora-Quick Technology: The KV Pharmaceutical claims its microsphere technology, known as Micro Mask, utilizing a unique patented taste masking technology. It does not use any type of solvent, thus leading to more quick and efficient tablet production. It also has lower heat production which is favorable for thermal-sensitive drugs. This technology claims faster dissolutions and better taste masking of tablet. Except for KV pharmaceuticals no other products manufactured by this technology are available in the market[51]. This technology evaluates parameters such as: Rate of absorption and dissolution, pleasant mouth feel, taste, physical strength, bioavailability, and stability.

Pharmaburst Technology: SPI Pharma, New castle, patents this technology. It utilizes the coprocessor excipients, dissolving within 30- 40seconds. This technology incorporates, dry blending of drug, flavor, and lubricant followed by compression into tablets[52]. Tablets obtained have sufficient strength so they can be packed in blister packs and bottles.

Lyoc: Lyoc, is a patented technology of Farmlyoc. The technology aims in producing via lyophilisation, a porous and solid galenic of an oil-in-water emulsion placed in the blister alveolus. This emulsion paste is then freezed in blister containing bulk drug or drug microparticles. Loco product has poor mechanical strength due to porousity but good disintegration rate[53]. Example of product is Phloroglucinol Hydrate-Farmlyco. Lyoc utilizes a freeze drying process but differ from Zydis in that the product is frozen on the freeze dryer shelves. To prevent inhomogeneity by sedimentation during this process, these formulations require a large proportion of undissolved inert filler (mannitol), to increase the viscosity of the in process suspension. It produces tablet by direct compression of powdered mixture with external lubrication[54].

Evaluation Parameters: It is important to evaluate the formulated drugs in order to determine the quality of the tablet[55,56]. Given below are the fundamental evaluation parameters .

Table 1: Evaluation Parameters of FDT

Parameters	Criteria
Weight Variation	Weight Variation tests are carried out according to either USP,IP,BP.
Hardness	Hardness of the tablet should be lesser than conventional tablet falling in the range of 3-4kg/cm^2
Friability	Friability should be within the range of 0.1-0.9%
Mechanical Strength	Should possess adequate mechanical strength to absorb the transportation shock and avoid breakage of tablet
Tablet Porosity	Tablet porosity is conducted(as per ICH guideline)
Disintegration Studies	The time period at which the tablet starts to disintegrate in given aqueous media is determined
Wetting time and water absorption	Use of simulated saliva to check the wetting time of tablet as well as water absorption
In-vitro Dispersion time	At optimum and fixed pH and temperature, time taken for dispersion of tablet in media is determined
Content Uniformity	Content uniformity according to either USP,IP,BP.
Dissolution Studies	Dissolution Studies carried out according to USP,IP,BP.
Stability Studies	Stability studies (including Accelerated Stability studies) are conducted according to the ICH guidelines

Limitations of Mouth Dissolving Tablets[58]:

- Poor mechanical strength and Fragility require careful handling
- Grittiness, residual taste or incomplete dissolution of tablet in mouth
- Large doses difficult to formulate
- Patients on anticholinergic medications & patients with Sjogren's syndrome experiencing dryness of the mouth due to decreased saliva production, the tablet may not produce desired disintegration and effects[59].

Challenges of Rapimelt Dissolving Tablet's: Despite the advantages of this formulation, it faces number parameters that come across as a challenge. These are listed below[60].

Table 2: Challenges of Rapimelt Dissolving Tablet's

Parameter	Description
Palatability	Drug should be made palatable to the patient, for easy administration, and should be sweet in nature. This is a challenge as most drugs are bitter in taste.
Mechanical Strength	The tablet should have optimum mechanical strength, along its excipients added, should not break easily, nor be friable. This is a challenge as the drug should rapidly disintegrate in oral cavity and yet have good mechanical strength
Hygroscopicity	This formulation is hygroscopic in nature as it should dissolve/ disintegrate when it comes in contact with water. Thus the vital mechanism of the formulation is a challenge and a limiting step
Aqueous Solubility	Aqueous solubility becomes a major issue if the drug is hydrophobic in nature or highly Lipophilic, thus it won't dissolve/disintegrate in mouth leading to grittiness and residue in mouth.
Tablet Size	Oral dissolving tablets should have an optimum tablet size of 7-9mm, and should not exceed it
Drug Concentration	Only potent drugs or drugs having a narrow therapeutic index, can be made into FDT's. These tablets are small in size utilizing minimum excipients and drug concentration. Hence all drugs are not suitable for this formulation.

Table 3: Some FDT Products in Global Market

Trade Names	Active Drug	Manufacturer
Zotacet MD	Cetirizine HCl	ZotaPharma
Zofran ODT	Ondansetron	GlaxoWellcome, Middlesex, UK
Alavert	Loratadine	Wyeth, U.S
Zelapar TM	Selegiline	Amarin Corp., London , UK
Valus	Valdecoxib	Glenmark
Romilast	Montelukast	Ranbaxy Labs Ltd., New Delhi, India
Pepcid RPD	Famotidine	Merck and Co., NJ, U.S.A
OlanexInstab	Olanzapine	Ranbaxy Labs Ltd., New Delhi, India
Aricept ODT	Donepezil	Eisai Co, Japan
Allegra ODT	Fexofenadine	Sanofi Aventis, France
Clonazepam ODT	Clonazepam	Par Pharmaceutical, U.S
Dolib MD	Rofecoxib	Panacea
Domray MD	Domperidone	Ray Remedies, Ahmedabad
Orapred OD	Predinisolone	Sciele pharma, Atlanta U.S

Nimulid-MD	Nimesulide	Panacea Biotech, New Delhi, India
Niravam	Alprazolam	Schwarz Pharma
Mosid-MT	Mosapride citrate	Torrent Pharmaceuticals, Ahmedabad, India
Maxalt MLT	Rizatriptan	Merck and Co., NJ, U.S.A

CONCLUSION

Fast dissolving tablets are considered to be contemporary dosage forms. These dosage forms and their route of administration results in better efficacy, rapid onset of action, enhanced bioavailability, and improved patient compliance. There are many marketed product of this category which have been introduced in the recent past. Some of the recent product in the Indian and global market are listed in table for ready reference (Table 3). The primary attractive factor of MDT is quick disintegration in oral cavity without the aid of water, along with sufficient mechanical strength. This feature makes this formulation a highly recommendable choice for geriatric and pediatric patients. FDT in the near future is expected to grow at a great and rapid pace, owing to the advancement in the scientific research and discovery of new excipients, resulting in a future-ready, combative arena of pharmaceutical drug delivery systems.

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