FORMULATION AND EVALUATION OF RAPID DISSOLVING TABLET - REVIEW

Priyanka V. Gawali, Ankita S. Bethe, Vaibhav S. Jadhav ,Dr. Balmukund R. Rathi
SGSPS Institute of Pharmacy,
Kaulkhed, Akola, Maharashtra, India - 444001
priyagawali1411@gmail.com

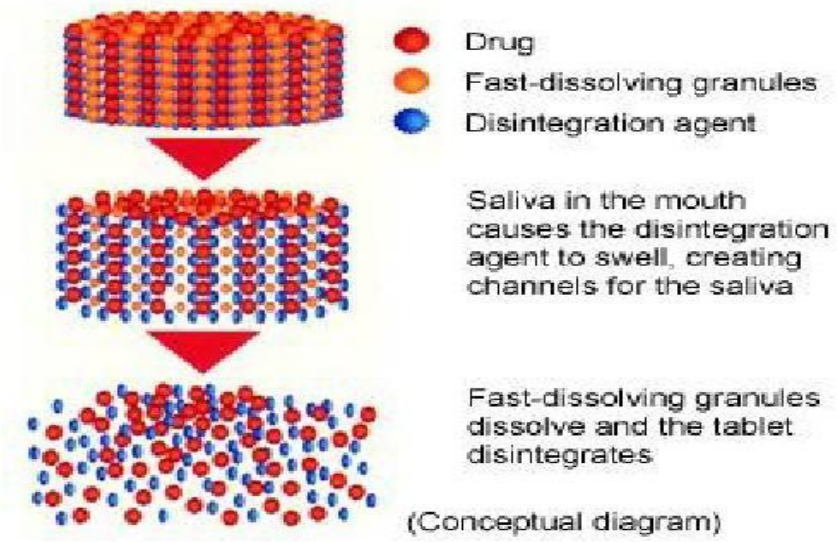
Abstract
In the current scientific environment, medication delivery technology is fiercely competitive and developing quickly due to rising demand. One such novel and distinctive drug delivery method that is quickly garnering significant attention in the realm of rapid dissolving technology research is the rapid dissolving tablet (RDT).Due to the large variety of medications that may be taken orally, this is the fastest and safest method of drug administration. Researchers have recently created Rapid dissolving tablets (RDTS), which dissolve or disintegrate quickly in saliva in the mouth without the need for water. Some tablets are known as genuine fast-dissolving tablets because they are designed to dissolve in saliva very quickly—in just a few seconds. Because RDTs include ingredients that accelerate the pace at which tablets disintegrate in the oral cavity, it is more appropriate to refer to them as fast disintegrating tablets. It can take them up to a minute to dissolve entirely.RDTs Superdisintegrants are added to formulations to speed up a tablet's buccal disintegration. This analysis outlines the many benefits, restrictions, and ideal qualities of formulation elements, use of super-disintegrate, technology used for RDTs and unique hole technology, medication ingredients for Rapid dissolving tablets, quality control tests , commercial formulations, and Patented drugs.

Keywords :-Rapid dissolving tablets, buccal disintegration, formulation, superdisintegrants, quality control tests.

Introduction

Oral delivery of medication is considered the most traditional method of treating sickness. Tablets are a frequently prescribed dose form because of its solidity, ease of production, and self-administration accessibility. Particularly, patients both geriatric and paediatrics , frequently struggle to take traditional tablets and This issue might worsen when travelling because of the lack of availability or limited water availability [1].A widely-accepted formulation that takes into account the benefits of the "oral cavity" is the oral disintegrating tablet, sometimes referred to as the rapid dissolving tablet.ODT (Oral dispersible Tablet) should disperse or disintegrate in less than 3 minute when placed on tongue," states the European Pharmacopoeia. The faster disintegrating drug delivery system (FDDDS) is a more recent idea that offers benefits over the conventional dosage forms while combining the features of both solid and liquid formulations [2].Many benefits come with these RDTs, including increased patient compliance, quick onset of action, bioavailability, and high stability. They also don't cause swallowing issues. Superdisintegrant is the main component that is required for the formulation of an RDT. A superdisintegrants primary job is to disintegrate the tablet when it comes into touch with stability. We are unable to create an optimal RDT without it. Therefore, to ensure that the medication has the highest possible bioavailability, the formulator must select the perfect combination and concentration of superdisintegrants to add to the formulation while creating an RDT [3] .With or without the intake of water, rapid dissolving tablets are a revolutionary drug delivery technology that dissociates, disintegrates, or disperses the API in saliva in a matter of seconds. Rapid

medication dissolving in a solution leads to rapid absorption and therapeutic effects. Certain medications may become more bioavailable when absorbed in the oral cavity or when they are absorbed before going into the stomach through pregastric absorption from saliva. Both natural and artificial Superdisintegrants, such as mucilage, poly vinyl pyrollidone, cross-linked carboxymethyl cellulose (croscarmellose), and sodium starch glycolate (primogel), offer rapid tablet breakdown and make it easier to create delivery systems with the desired characteristics. These formulations are commonly utilised for urgent treatments such as cardiovascular agents, asthama, brain stroke, and anti-hyperlipidemia [4].Quick RDT breakdown exposes the active ingredient to taste receptors, making a pleasant flavour crucial for patient palatability. Therefore, one of the most important challenges to be solved for achieving the successful development of RDT formulations is the taste-masking of unpleasant active ingredients. Oral delivery of bitter active ingredients via RDT formulations should, in general, promote compliance among patients with dissolving/disintegrating tablets that contain flavours and sweets and enhance accessibility. Therefore, one of the most important challenges to be solved for the successful creation of FDT formulations is the taste-masking of bitter active ingredients. Oral delivery of bitter active ingredients via FDT formulations should, in general, promote patient compliance with dissolving/disintegrating tablets that contain flavours and sweets which will enhance taste and texture. However, these additions weren't a sufficient way to completely disguise flavour. New developments in technology have made it possible to hide the taste of bitter medications with different dosages. There have been numerous documented methods, including fluidized-bed coating, complexation, freeze drying, microencapsulation, and supercritical liquids to cover up tastes [5] .Rapid disintegrating tablets are also called as Fast-dissolving tablets, fast disintegrating Tablets, fast dissolving tablets, Fastdispersible tablets, rapimelts, pFastus tablets, quick Dissolving tablet. When put on the tongue, a rapid disintegrating tablet (RDT) is a solid dosage form that includes medication and dissolves quickly (in a matter of seconds) without the need for water. Saliva contains the medicine, which is released, dissolved, or distributed



before being eaten and absorbed by the body [6] .

Fig 1: Conceptual diagram of RDTs

Advantages of Rapid dissolving tablets [6,7]:-

1. Water is not required for swallowing the tablet.
2. Patients with mental disabilities, the elderly, and children can all get RDTs with ease of administration.
3. precise dosage in contrast to liquids.

4. The medicine dissolves and absorbs quickly, resulting in a rapid commencement of effect.
5. Drug bioavailability is enhanced because certain medications are absorbed through the mouth, throat, and oesophagus and enter the stomach through saliva.
6. Superior to liquid medicine in terms of conveyance and administration.
7. Reduced first pass metabolism improves bioavailability, resulting in lower doses and adverse effects.
8. Chewing is not required.
9. Possess a pleasant tongue sensation.
10. It is economical.
11. Exhibit little susceptibility to external conditions such as humidity and temperature.

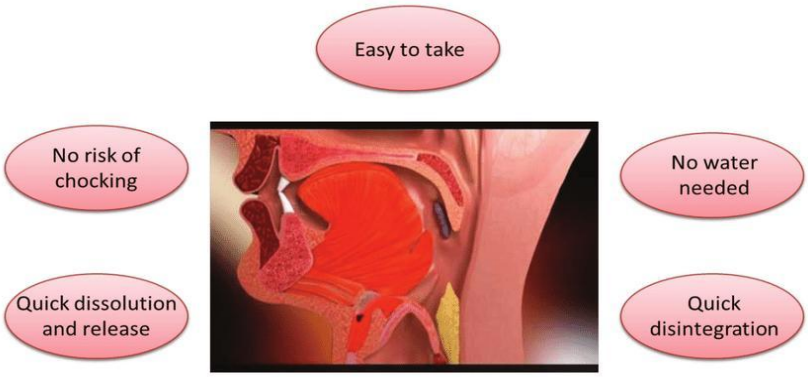


Fig 2 : Advantages of RDTs

Disadvantages of rapid dissolving tablets [8] :-

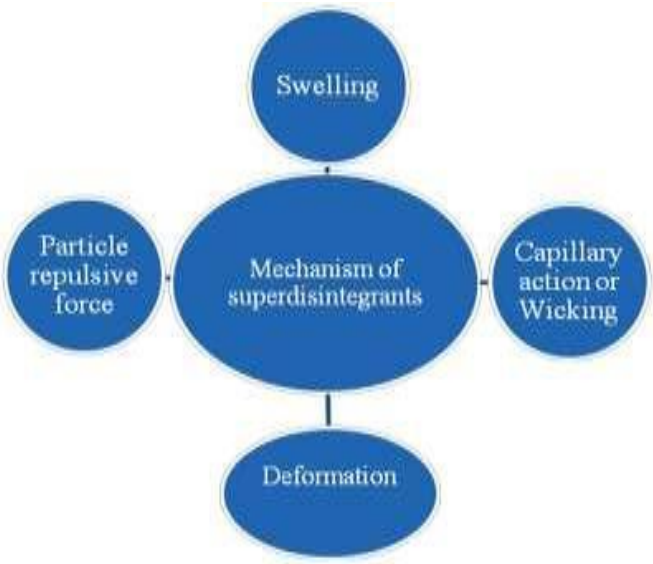
1. The mechanical durability of the tablets is one of the main drawbacks of RDTs.
2. Due to their hygroscopic nature, some RDT require specialised packaging in order to retain their physical integrity under typical humidity conditions.
3. Dry mouth brought on by a reduction in salivary flow might not be a suitable fit for these tablet forms.
4. Drugs with unpleasant tastes are hard to manufacture as RDT; more care needs to be taken while manufacturing such a medication.
5. It occasionally has a mouth sensation.
6. RDT needs specialised packaging in order to stabilise the product appropriately and ensure product safety.
7. It also demonstrates the quality of the brittle, effervescent grains.

Mechanism of Rapid dissolving tablets [8,9]:-

A drug's bioavailability is dependent on its absorption, which is influenced by its ability to penetrate through the membrane of the intestinal tract and its solubility in gastrointestinal fluid. A drug's solubility is mostly determined by its physiochemical characteristics. The tablet's disintegration has a significant impact on the pace of medication breakdown. Disintegrants are an essential component of tablet formulations; they are added to tablets in order to cause them to break when they come into contact with aqueous fluid. This process, which separates component particles prior to drug dissolution, is called the disintegration process, and the ingredients that cause it are referred to as disintegrants. The purpose of adding disintegrants is to improve the tablet fragments' surface area and to overcome the cohesive forces that hold the fragments linked together. In order to accomplish the desired quick dissolving properties, RDTs use the following mechanisms:

1. For the tablet to dissolve and disintegrate swiftly, water must get into the distribution matrix of the tablet rapidly.
2. The tablet formulation's use of a suitable disintegration agents or absolutely water soluble excipients.
3. The tablet is broken down into tiny particles via a few methods that are listed below, which leads to a medication suspension or solution. The mechanisms are -
    - High swellability of disintegration
    - Chemical reaction
    - Capillary action

Fig 3 : Mechanism of RDTs



Ideal characteristics of RDT [10,11]:-

The technology employed in the production of RDTs affects their performance. Such tablets must have the capacity to dissolve quickly and spread throughout saliva in order to eliminate the requirement for water. Diverse technologies have been created to allow RDTs to carry out this special duty. The best fast-dissolving tablets should fulfil the below requirements:

- It must to be a motivator for the surrounding circumstances, Like temperature and humidity.
- Water shouldn't be needed in order to take it orally.
- It should be tough enough to endure the rigours of production procedures and handling thereafter.
- After disintegrating, it shouldn't leave any trace in the mouth.
- It needs to permit heavy drug loading.
- It need to be able to adjust to packaging as well as processing equipment used today.
- It need to be reasonably priced.
- It is reasonable to feel good in the mouth.
- Show minimal sensitivity to surroundings like humidity and temperature.
- Be in equilibrium with flavour masking.

Salient Feature of Rapid Dissolving Drug Delivery System [11,12] :-

- Simple administration for patients who have difficulty swallowing, including the elderly, stroke victims, bedridden patients, patients suffering from kidney failure, and individuals in paediatric, geriatric, or mental health settings who refuse to swallow.

- The dose form does not require water to drink, making it a practical option for patients travelling or without fast access to activities.
- The medicine will dissolve and absorb quickly, resulting in a prompt commencement of action.
- As the saliva travels down into the stomach, some medications undergo absorption from the mouth, throat, and oesophagus. In these situations, a drug's permeability is enhanced.
- Pregastric absorption can lead to decreased frequency of dosage and increased bioavailability, which can enhance therapeutic efficacy by minimising side effects.
- A pleasant mouthfeel can assist to alter the idea that tablets are bitter. Especially in individuals who are younger.
- Because there is no physical barrier during the oral administration of traditional Formulation, there is less chance of choking or suffocating, promoting safety.
- Life cycle management, product diversification, patent extensions, and product marketing are examples of novel business prospects.
- Beneficial in situations requiring a very quick ji course of action, such as motion sickness, abrupt bouts of allergic reaction, or coughing.
- An enhanced bioavailability owing to the quick dissolving and breakdown of these tablets, especially for insoluble and hydrophobic medicines
- Stability for a longer period of time since the medication is dosed solidly until it is consumed. Thus, it combines the benefits of liquid dosage form for bioavailability with solid dosage form for stability.

Excipients used in Formulation of rapid dissolving tablets: -

Superdisintegrants: -

The quicker dissolving formulation is becoming more and more in demand as time goes on. Therefore, the chemist must create super disintegrants, or disintegrants that are more effective intragranularly and dissolve at lower concentrations with better disintegration effectiveness. These super disintegrants work by swelling, and as a result of swelling pressure applied in a radial or exterior direction, the tablet bursts or water absorbs more quickly, resulting in an significant granule volume increase to encourage breakdown.

Bulking Material: -

Bulking elements play a crucial role in the creation of tablets that dissolve quickly. They serve as a filler, diluent, and cost-cutting tool. In addition to adding quantity and lowering the concentration of the active ingredient in the formulation, bulking agents optimise the appearance of the tablets, which subsequently increases the disintegration in the mouth. For better water solubility and sensory perception, the bulking compounds for this dosage form should be more sugar-based, such as starch hydrolysate, mannitol, polydextrose, and lactose derivatives such as immediately compressible lactose (DCL). Because of its adverse effects heat of solution, mannitol in particular has a cooling impact and good sensory perception in water. Between 10% and 90% of the final composition's volume is added in bulking agents.

Emulsifying agents: -

Emulsifying chemicals play a crucial role in the formulation of rapid dissolving tablets by facilitating rapid drug release and disintegration eliminating any requirement for chewing, swallowing, or intake of water. Emulsifying chemicals also improve bioavailability and stabilise impermeable mixes. Emulsifying compounds that come in a range of forms for quickly dissolving tablet formulations include lecithin, sucrose esters, propylene glycol esters,

and alkyl sulphates. These can be added to the final formulation in an amount ranging from 0.05% to around 15% by weight.

Lubricants: -
These excipients can help make the tablets more appealing once they dissolve in the mouth, even though they are not necessary. Lubricants facilitate the passage of medication from the mouth to the stomach and diminish grittiness and stickiness. Lubricants facilitate the passage of drugs from the mouth to the stomach by reducing roughness.
Flavours (taste masking agents) and Sweeteners :-
Patients find the items more appetising and pleasant when flavours and taste masking agents are included. The infusion of these components helps some actives' unpleasant tastes and bitterness to be overcome. Both artificial and natural tastes can be added to improve the physiological properties of quickly dissolving tablets. There are many different types of sweeteners available, such as sugar, dextrose, and fructose, as well as non-nutritive sweeteners including sucralose, aspartame, sodium saccharin, and sugar alcohols.

Technologies used for preparation of rapid dissolving tablets :-
The tablet's fast dissolving ability is explained by water absorbing into the tablet matrix quickly, which causes the tablet to disintegrate quickly. Therefore, the fundamental methods for creating rapid dissolving tablets involve optimising the tablet matrix's porosity, adding the proper disintegrating agent, and using excipients that are highly soluble in water in the formulation. The following list includes the many technologies employed in the development of rapid dissolving tablets [15-16] :-

Melt granulation :-
Melt granulation is a method where a meltable binder effectively agglomerates pharmaceutical powders. This method has the benefit over conventional granulation in that it doesn't require the use of organic solvents or water. Compared to wet granulation, this technique requires less time and energy as there is no drying stage. It is a helpful method for increasing the pace at which medications that are poorly soluble in water, such griseofulvin, dissolve [16]. This method uses Superpolystate©, PEG-6-stearate, a hydrophilic waxy binder, to create FDT with enough mechanical stability. Superpolystate© is a waxy substance with an HLB value of nine and a melting point between 33 and 37°C.As a result, it will serve as a binder, strengthen the tablets' physical resistance, and aid in their dissolution as they quickly melt and dissolve in the mouth, disposing of no traces [17] .

Mass Extrusion :-By softening the active blend with a solvent mixture of methanol and water-soluble polyethylene glycol, this technology produces an elongated extrude that is then cut into even segments with a heated blade to form tablets. The softened mass is then ejected through an extruder or syringe. Moreover, this method can be applied to coat bitter medication grains in order to hide their flavour [16,17] .

Freeze-drying or lyophilisation :-
This is a pharmaceutical procedure that enables the removal of water by sublimation while applying suction to dry heat-sensitive medications and biological materials at low temperatures. After being dissolved or distributed in a carrier's aqueous solution, the drugs are added to premade blister packs, frozen out with a nitrogen flush, and the procedure is finished in the refrigerator.Lyophilization processes are characterised by high porosity and specific surface area, as well as quick oral dissolution, which results in excellent medication bioavailability. The main disadvantage of this method is its fragility, time-consuming process,

and expensive cost, which makes traditional packaging unsuitable for packing this dosage form and causes stability problems under pressure.

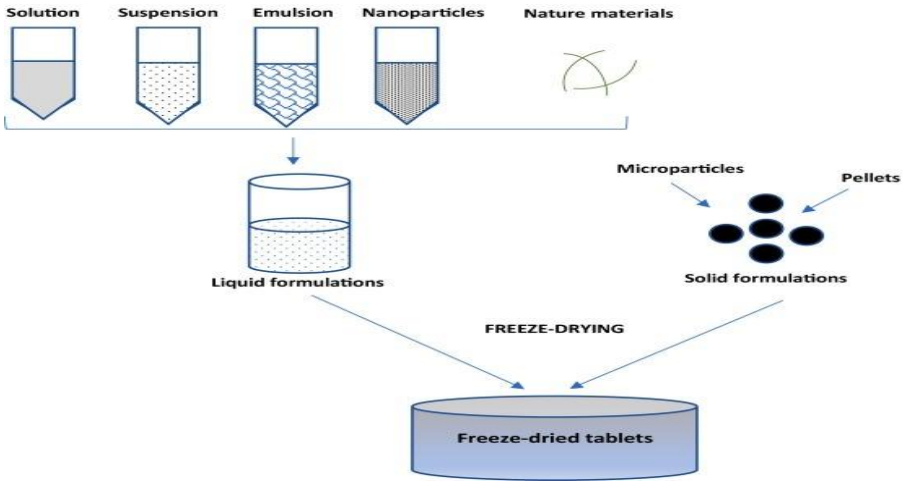


Fig 5: Systemic representation of Freeze drying

Phase transition process :-

It is determined that the production of RDTs without the need for specialised equipment requires a mix of sugar alcohols with both high and low melting points along with a phase transition throughout the entire production process.FDT was created by compressing powder that included the sweetener (melting point: 93 95 °C) and erythritol (melting point: 122 °C), and then heating for 15 minutes at around 93 °C.The tablets exhibited an increase in both rigidity and average diameter of pores upon heating. The lower melting point sugar alcohol's crystal form had no bearing on the rise in tablet hardness that occurred after heating and storage [19].

Three-dimensional Printing (3DP) :-

One technique used in rapid prototyping (RP) is three-dimensional printing (3DP).Using liquid binding materials and powder processing, prototyping entails building discrete layers. We created a brand-new quick dissolving drug delivery device (DDD) that contains loose granules. Making use of the three-dimensional printing (3DP) method [20] . The 3DP system automatically created the DDD containing the medication paracetamol based on computer-aided design models. It was discovered that TAG may be used to produce oral tablets that dissolve quickly and with the right amount of hardness. The quick disintegration of the TAG tablets appeared to be caused by the tablet's high pore size and overall pore volume allowing for quick water penetration [21] .

Direct Compression:-

The simplest and most economical method of producing tablets is direct compression. This method may now be used to prepare rapid dissolving tablets since better excipients, particularly superdisintegrants and sugar-based excipients, are more readily available [22] .

Superdisintegrants

Superdisintegrants, mostly for direct compression procedures, are the key factors influencing the rapid dissolving tablets' disintegration and eventual dissolve. The breakdown process is accelerated by the addition of additional chemicals, such as effervescent agents and water-soluble excipients.

Sugar based excipients

There is another way to go about using the direct compression method.The use of sugar-based excipients, particularly bulking agents such as starch hydrolysate, lactilol, dextrose, fructose, maltilol, maltose, mannitol, sorbitol, polydextrose, xylitol, and isomalt, which exhibit high aqueous solubility and sweetness and so provide a pleasing mouthfeel and taste masking properties. Sugar-based excipients have been divided into two groups by Mizumito et al. According to the rates of dissolution and moulding [23].

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.

Sublimation :-

Sublimation is the procedure used when volatile chemicals are added to create a porous combination. Among the very volatile compounds that can be crushed into a tablet are benzoic acid, ammonium bicarbonate, ammonium carbonate, camphor, naphthalene, urea, phthalic anhydride, and urethane. This volatile substance is subsequently eliminated by the sublimation process, leaving behind a very porous matrix.It has been claimed that tablemade using this method often dissolve in 10–20 seconds. Pore-forming agents can be tablet made from solvents such as cyclohexane and benzene [24].

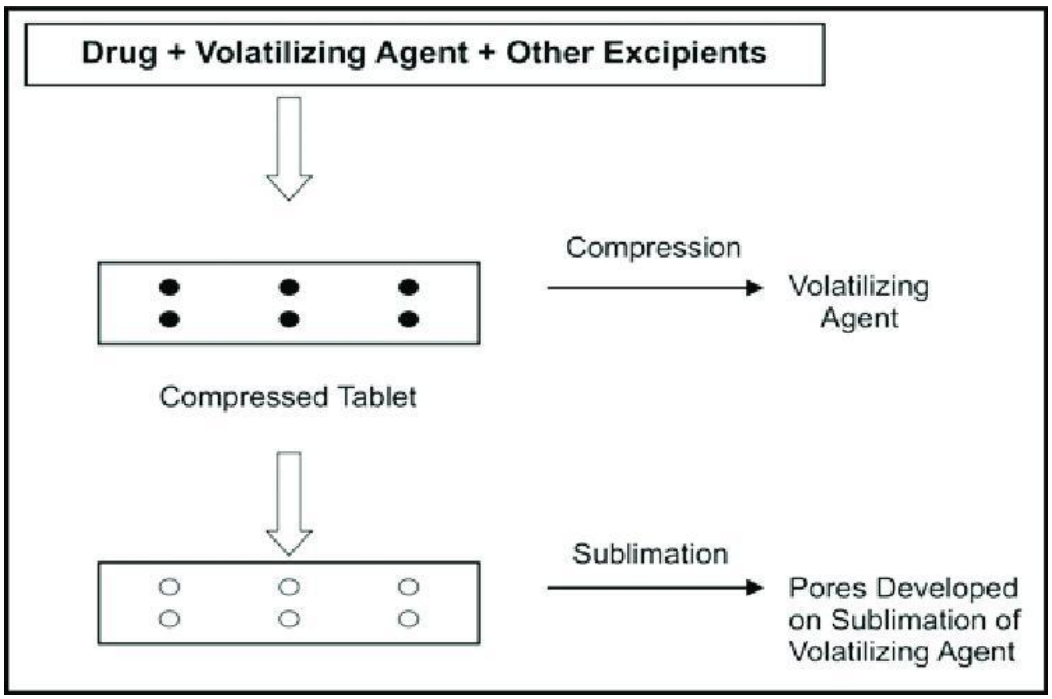


Fig 6 : systemic representation of sublimation process

Tablet moulding :-

are two sorts of moulding processes: solvent technique and heat method. Solvent-produced FDT have a porous structure that speeds up dissolving and are less compact than compacted tablets. One major worry is the moulded tablets' mechanical robustness [25]. It is necessary to add binding agents, which increase the tablets' mechanical strength. Spray-congealing a molten mixture of rectified polyethylene glycol, cottonseed oil, lecithin, and sodium carbonate—the active ingredient—into a lactose-based tablet triturate form is how the disguised drug particles are prepared. Masking of flavour is an additional issue with this approach Compared to the lyophillisation approach, the moulding technique produces tablets that are easier for manufacturing companies to scale up [26].

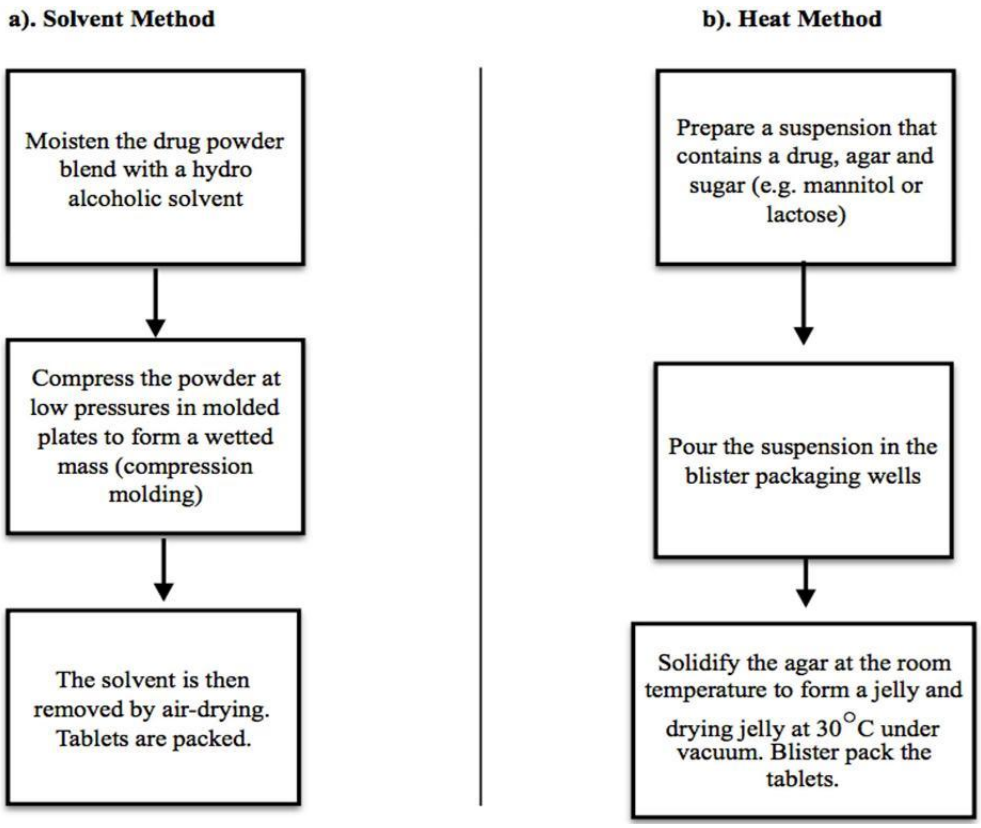


Fig 7 : Systemic representation of Tablet moulding

Spray drying technology :-

Spray-drying technique is used in the pharmaceutical industry to create very porous powders. Spray-drying causes the processing solvent to swiftly evaporate, leaving Behind a very porous material that is suitable for creating delicious tablets. It has been noted that tablets composed of the powder which has been spray-dried disintegrate in aqueous solutions [26] .

Marketed products of Rapid dissolving tablets :-

Brand name	**Active ingredient**	**Company**
Zomig ZMT and Rapimelt	Zolmitriptan	AstraZeneca
Alavert	Loratidine	Wyeth Consumer Healthcare
Cibalginadue FAST	Ibuprofen	Novartis Consumer Health
Hyoscyamine Sulfate FDT	Hyoscyamine Sulfate	ETHEX corporation
Nulev	Hyoscyamine Sulfate	Schwarz Pharma
Kemstro	Baclofen	Schwarz Pharma

Fluoxetine FDT	Fluoxetine	Bioavail
Benadryl Fastmelt	Diphenhydramine	Pfizer
Zolpidem FDT	Zolpidem tartarate	Bioavail
Nasea FDT	Ramosetron	Yamanouchi
Gaster D	Famotidine	Yamanouchi

Quality Control tests for RDTs :-
All of the formulae' manufactured tablets went through the following quality control tests: -

Physical appearance:-
opinions of a tablet's overall look, visual identity, and degree of "elegance" depend on a number of factors, including the tablet's size, shape, colour, and taste as well as its surface texture, physical defects, consistency, and legibility of any identifying markings [27].

Tablet thickness :-
The tablets' uniform thickness is used by some filling machinery as a counting mechanism. Just as with regular tablets, a micrometre or Vernier calliper may be used to measure the tablet's thickness. You may take ten tablets and check the thickness of each with a micrometre [28].

Hardness :-
A Monsanto hardness tester (Perfit) was used to determine the tablets' crushing strength. Every formulation batch had three pills randomly tested, and the average reading was recorded. In kg/cm, the hardness is expressed.

Friability:-
A Roche friabilator (Veego, India) was filled with ten weighted pills and turned at 25 rpm for four minutes. The tablets were removed, cleaned, and put back into the scale. Using the formula below, the tablets' % friability was calculated [29].
Percentage friability = Initial weight – Final weight ÷ Initial weight × 100.

Wetting Time :-
Six millilitres of distilled water were placed in a Petri plate. It was placed on a tablet that had a little amount of ammaranth colour. The amount of time it took for the tablet's top surface to turn completely red was observed.

Vitro Disintegration Time :-
At first, the fast-dissolving tablet's disintegration time was determined using the traditional tablet testing method as outlined in the Pharmacopoeia. Tablet computers were positioned in The amount of time and disintegration tubes needed for a full disintegration without any Disintegration time was measured using residues on the screen [30].

In vitro dispersion time:-
To evaluate the in vitro dispersion time, a tablet was dropped into a beaker filled with 50 millilitres of pH 6.8 Sorenson's buffer. For each formulation, three tablets were chosen at random, and an in vitro dispersion test was conducted.

In vitro dissolution studies :-
Using the USP paddle technique at 50 rpm in 900 cc of Sorenson's buffer (pH 6.8) as the dissolving media, formulation tests were conducted in vitro at 37±0.50C. At the designated intervals, 5 ml of the aliquot was taken out, filtered using Whatmann filter paper, and subjected to spectrophotometric analysis at 260 nm.To keep the volume constant throughout the test, an equivalent amount of freshly heated material was added to the dissolving media after each sample [31].

Packaging :-
According to the ICH requirements for stability study, one of the key components in the creation of RDT is packaging. A few key characteristics, most notably mechanical strength, show considerable differences between the products created using different procedures. After a variety of technologies, including Zydis, Lyoc, Quicksolv, and nanocrystals, are used in the lyophilization process, the final goods are porous by nature, have a low physical resistance to moisture, and may deteriorate in environments with higher humidity levels [32] . The aforementioned elements demand that things be packaged properly when they are acquired. Peelable backing foil is a common packaging material for Zydis units. For OraSolv tablets, Packsolve provides a unique packaging solution with a dome-shaped blower that prevents the tablet from moving vertically within the depression and shields it from shattering during storage and transportation. Many of the DuraSolv items that were purchased. Push-through blisters or bottles are commonly used to package technologies like WOW Tab, Pharmaburst, OraQuick, and Ziplets, among others, because of their mechanical resilience to withstand handling and transportation shocks [33] .

Challenges in Formulation of RDT [34,35] :-

- **Palatability :-**Taste-masking of the medications becomes crucial to patient compliance since the majority of orally disintegrating drug delivery systems breakdown or disintegrate in the patient's oral cavity, releasing the active substances that come into touch with the taste buds**.**
- **Mechanical strength :-**Because RDTs are created with a very low compression force, they are friable and/or cracked, challenging to handle, and sometimes require specialised peel-off blister packing that may raise the cost of the tablet. This allows the tablets to dissolve in the mouth. Few technologies, including Yamanouchi Shaklee's Wowtab® and CIMA Labs' Durasolv®, can make tablets that are strong and durable enough to be packed in multidose bottles**.**
- **Aqueous Solubility :-**Water-soluble medications create eutectic mixtures, which lower the freezing point and produce a glassy solid that may shatter as it dries out due to the sublimation process's loss of supportive structure**.**
- **Hygroscopicity** :-A number of dose formulations that dissolve orally are hygroscopic, meaning they cannot Keep your body intact in typical humidity and temperature conditions. Therefore, They require specific product packaging in order to protect them from dampness.
- **Mouth feel:-**In the mouth, RDTs shouldn't break down into bigger particles. Particles formed following the RDTs' disintegration ought to be as little as feasible. Additionally, the oral feel is improved by the inclusion of flavours and chilling substances like menthol.
- **Sensitivity to environmental conditions** :-RDTs should be less sensitive to temperature and humidity as most of the components used in them are designed to dissolve in a little amount of water.

Conclusion :-

Rapid dissolving tablets are novel dosage forms that were created with the purpose to address some of the issues associated with traditional solid dosage forms, such as oral tablet difficulties in older and younger patients. The rapid dissolving or disintegration of tablets is their intended function, with a range of 5 to 60 seconds. The rapid dissolving drug delivery system has emerged as a key component of innovative drug delivery systems in response to the growing demand for such systems. With the advent of the fast-dissolving medication delivery method, traditional dosage form distribution has been impacted. Over the past ten years, there has been a significant surge in the popularity With RDTs.For patients who are young, old, bedridden, schizophrenic, or who are travelling, as well as those who might not have access to water, RDT has to be developed. These products give innovators the chance to extend their patent term and expand their product range in the marketplace. The results of the clinical trials demonstrate that RDTs can improve bioavailability, offer a quick start of action, and enhance patient compliance. Given all of the advantages of RDTs, it won't be long before most oral formulations are made in RDT forms. A line extension in the market is another potential presented by the creation of a fast-dissolving tablet; a variety of medications (such as neuroleptics, cardiovascular medications, analgesics, antihistamines, and medications for erectile dysfunction) can be considered candidates for this dosage form. Another factor contributing to the rise of readily available fast-dissolving/disintegrating products is pharmaceutical marketing. It's typical for pharmaceutical companies to produce a certain pharmacological entity in a new and enhanced dosage form when its patent life is almost over.

References

1. Ramakant Joshi , Navneet Garud and Wasim Akram , "Fast dissolving tablets : review Article" *IJPSR* (2020), Volume 11, Issue 4.
2. R.D.Rahane,Dr Punit R. Runchh,"A review on fast dissolving tablet",*Journal of Drug Delivery & Therapeutics.* 2018; 8(5):50-55.
3. Kushagra Khanna, Gauravi Xavier, Suresh Kumar Joshi, Aashish Patel, Sakshum Khanna, Vipin and Bhawna Goel ,"Fast Dissolving Tablets- A Novel Approach",*Int. J. Pharm. Res. Allied Sci.,* 2016, 5(2):311-322.
4. Mangesh Machhindranath Satpute, Nagesh Shivaji Tour," Formulation and in vitro Evaluation of fast dissolving tablets of metoprolol tartrate",Brazilian *Journal of Pharmaceutical Sciences,* vol. 49, n. 4, oct./dec., 2013.
5. CH. Jyothi, K. Akhil Kumar, M. Mamatha, N. Mamatha, G. Soujanya and Dr. K. Hemamalini,"FORMULATION AND EVALUATION OF FAST DISSOLVING TABLETS OF ZIDOVUDINE USING SUBLIMATION TECHNIQUE",*World Journal of Pharmaceutical Research*,Vol 7, Issue 13, 2018.
6. CH. Jyothi, K. Akhil Kumar, M. Mamatha, N. Mamatha, G. Soujanya and Dr. K. Hemamalini,"FORMULATION AND EVALUATION OF FAST DISSOLVING TABLETS OF ZIDOVUDINE USING SUBLIMATION TECHNIQUE",World *Journal of Pharmaceutical Research*,Vol 7, Issue 13, 2018.
7. Garima Yadav, Anupriya Kapoor and Shilpi Bhargava,"FAST DISSOLVING TABLETS RECENT ADVANTAGES: A REVIEW",IJPSR (2012), Vol. 3, Issue 03.
8. ASHISH MASIH, AMAR KUMAR, SHIVAM SINGH, AJAY KUMAR TIWARI,"FAST DISSOLVING TABLETS: A REVIEW ",*Int J Curr Pharm Res,* Vol 9, Issue 2, 8-18.
9. Priyanka Nagar, Kusum Singh, Iti Chauhan, Madhu Verma, Mohd Yasir, Azad Khan, Rajat Sharma and Nandini Gupta ,"Orally disintegrating tablets : formulation,

preparation Techniques and evaluation”,*Journal of Applied Pharmaceutical Science* 01 (04); 2011: 35-45.
10. Debjit Bhowmik, Chiranjib.B, Krishnakanth, Pankaj, R.Margret Chandira,“Fast Dissolving Tablet: An Overview ”,*Journal of Chemical and Pharmaceutical Research,* 2009, 1(1): 163-177 .
11. PREETI, VIJAY AGARWAL, ABHINAV AGARWAL,“AN OVERVIEW ON MOUTH DISSOLVING TABLET: FROM MANUFACTURING AND PATENTED TECHNIQUE TO QUALITY CONTROL TEST”, *Asian J Pharm Clin Res*, Vol 15, Issue 11, 2022, 7-13.
12. Keshari Roshan , M. Bharkatiya, Rathore K.S, Shyama S. Kumar, Gajaram Sirvi, somani Neelam Bhupal Nobels,“FAST DISOLVING TABLET DRUG DELIVERY SYSTEM- AN OVERVIEW”,Keshari, et al. *Int J Pharm* 2015; 5(2): 577-589.
13. Basu B, Abhishek B, Sagar M, Vora V, Devraj Bhatt, Abhay D. Formulation and Evaluation of fast dissolving tablets of cinnarizine using super disintegrant blends and Subliming material. *Journal of Advanced Pharmaceutical Technology & Research*. 2011; 2(4): 266–273.
14. Prakash Ved, S. Maan, Deepika, Shiv Kumar Yadav, Hemlata, Vikas J. Fast Disintegrating tablets: Opportunity in drug delivery system. *Journal of Advanced Pharmaceutical Technology & Research*. 2011; 2(4): 223–235.
15. Bahrainian S, Abbaspour M, Kouchak M, Taghavi M. P. A Review on Fast Dissolving Systems: From Tablets to Nanofibers. Jundishapur *J Nat Pharm Prod*. 2017; 12(2): 34267.
16. Neeta, Dureja Harish, Bhagwan Shiv, Seema, Dahiya JyoJyoti,“ Fast dissolving tablets:An overview”,*Novel Science International Journal of Pharmaceutical Science* (2012), 1(5):228-232 228 .
17. V.Dinesh kumar , Ira Sharma and Vipin Sharma,“A comprehensive review on fast Dissolving tablet Technology ”,*Journal of Applied Pharmaceutical Science* 01 (05); 2011: 50-58.
18. Kuchekar BS, Atul, Badhan C, Mahajan H S, Mouth dissolving tablets: A novel drug Delivery system, *Pharma Times*, 35, 2003, 7-9.
19. Kuno Y, Kojima M, Ando S, Nakagami H,“Evaluation of rapidly disintegrating tablets Manufactured by phase transition of sugar alcohols”,*Journal of Controlled Release* ,2005; 105(1, suppl 2): 16-22.
20. Yu DG, Shen XX, Han J, Zhu LM,Branford-White C, Li XY, Yang XL,“ Oral Fast-Dissolving DDD Fabricated Using 3DP”, *Bioinformatics and Biomedical Engineering. The 2nd International Conference* 2008; 1602–605.
21. Ito A, Sugihara M. Development of oral dosage forms for elderly patients: use of agar as Base of rapidly disintegrating oral tablets. *Chem Pharm. Bull.* 1996; 44(11):2132-136.
22. Gauri, S., Kumar, G., Fast Dissolving Drug Delivery and its Technologies,*The Pharma Innovation*,2012,1(2),34-39.
23. Deshmukh, V. N., Mouth Dissolving Drug Delivery System: A Review,Int *J. Of PharmTech Research,*2012,4(1),412-421.
24. Sharma R, Rajput M, Prakash P, Sharma S. Fast dissolving drug delivery system: a Review. *Int Res J Pharm* 2011;2:21-9.
25. Ahet Smita S,Saudagar R B ,Shinde Mayuri S,“ Fast Dissolving Tablets – A review *”,Int J Curr Pharm Res*, Vol 10, Issue 2, 5-12.
26. Kumar AH, Kavitha K, Kumar SA, Kumar MR, Singh SD. Novel approach of bilayer tablet Technology-a review. *Int J Pharm Chem Biol Sci* 2013;3:887-93.

27. Deepak Sharma,“ Formulation Development and Evaluation of Fast Disintegrating Tablets of Salbutamol Sulphate for Respiratory Disorders ”, *ISRN* Pharmaceutics,vol 2013,pg 8.
28. B. Senthilnathan and A. Rupenagunta, “Formulation development and evaluation of Venlafaxine hydrochloride orodispersible tablets,” *International Journal of Pharmaceutical Sciences and Research,* vol. 2, no. 4, pp. 913–921, 2011.
29. Alok Kumar Gupta, Anuj Mittal and Prof. K. K. Jha,“Fast Dissolving Tablet- A Review”,*THE PHARMA INNOVATION*, Vol. 1 No. 1 2012.
30. S.Muralidhar, T.V.Narayana,Ch.S.Phani Kumar ,Mahajan Anil Arun ,“Formulation And Evaluation Of Fast Dissolving Tablets By Addition Of Different Concentrations Of Superdisintegrant And By Effervescent Technology”,*Int J. Pharm. Drug. Anal*, Vol: 7, Issue: 1, 2019; 1 – 10.
31. Md.Nehal Siddiqui, Garima Garg, Pramod Kumar Sharma,“ FAST DISSOLVING TABLETS: PREPARATION, CHARACTERIZATION AND EVALUATION: ANOVERVIEW”, *International Journal of Pharmaceutical Sciences Review and Research,*Volume 4, Issue 2, September – October 2010; Article 015.
32. Chang RK, Guo X, Burnside BA, Couch RA. Fast dissolving tablets. *Pharm Tech,* 2000; 24(6):52-58.
33. Jaysweh J Harani, Dhaval A Rathod, Kantilal R Vadila, Orally disintegrating tablets, A Review, *Tropial Journal of Pharm.Sciences*, 2009, 8(2), 161-172.
34. Noushin Bolourchian, Mohammad Mehdi Mahboobian, and Simin Dadashzadeh. “The Effect of PEG molecular weights on dissolution behavior of Simvastatin in solid Dispersions.” Iranian journal of pharmaceutical research: *IJPR* 12, no. Suppl (2013): 11.