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A REVIEW ON –FORMULATION AND *IN-VITRO* EVALUATION OF ORODISPERSIBLE TABLETS

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Abstract:
Recent advances in novel drug delivery (NDDS) aims to enhance the safety and efficacy of drug molecule by formulating a convenient dosage form for ease of administration and to achieve better patient compliance. Orodispersible tablet is advanced and convenient drug delivery system, now days acquiring the most widely accepted dosage form. The recent advance in NDDS aimed for the development of dosage forms convenient to manufacturing and administration, immediate release and increased bioavailability. Orally disintegrating tablets are solid dosage forms containing drug that disintegrate in the oral cavity within less than 1 minute leaving an easy-to-swallow residue. Orally disintegrating tablets is a good choice of drug delivery for pediatric and geriatric patients because difficulty in swallowing (Dysphasia). As our society is becoming increasingly age, there is need to development of an appropriate dosage form for the elderly patients are mostly desirable. The Advance development in oral disintegrating technology mainly works to improve the disintegration quality of dosage forms without affecting their integrity of dosage form. This article focuses on the available patented technologies and the advancements made so far in the field of fabrication of orodispersible tablets. Apart from the conventional methods of formulation, this review also provides the detailed concept of formulation, in-vitro evaluation and some unique technologies.

Keywords: *Orodispersible tablet, Dysphasia, Integrity, Patented technologies*.

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INTRODUCTION:

Oral route of drug delivery is the most common and preferred route of drug administration both for solid and liquid dosage forms. However, solid dosage forms are popular because of the ease of administration, self-medication, accurate dosage, and most important is patient compliance. Tablets and capsules are the most popular solid dosage forms.(1) However, the most of people face difficulty in swallowing tablets and gelatin capsules. This difficulty in swallowing is called dysphasia. The dysphasia has been found that this problem has been encountered in all groups of patient, but especially with pediatric and geriatric patients'. Thus, this conventional dosage forms results in high incidence of noncompliance and ineffective therapy in the case of dysphasia in pediatric, geriatric, or any mentally retarded persons.so the orally disintegrating tablets is formulate.(2) orally disintegrating tablets are also called as Orodispersible tablets, mouth-dissolving tablets, rapid-dissolving tablets, fast-disintegrating tablets, fast-dissolving tablets. The most desirable formulation for use by the elderly patients is one that is easy to swallow and easy to handle. taking these requirements into consideration, venture have been made to develop an orodispersible tablet. Oro dispersible tablets (ODT) are solid single-unit dosage forms that are placed in the mouth, allowed to disperse/dissolve in the saliva and then swallowed without the need for water.(3) One study showed that 26% of 1576 patients experienced orally disintegrating tablets have been developed, which combine hardness, dosage uniformity, stability and other parameters, with extremely easy administration since the no water is required for swallowing the tablets. They are thus suitable for geriatric, pediatric and traveling patients. Recently the European Pharmacopoeia adopted the term orodispersible tablet as a tablet to be placed in the oral cavity where it disperses rapidly before swallowing and which disintegrates in less than 3 min. that is why we find certain ODT in the market that disintegrate in less than 1min or maybe 30 s. The solution containing the active ingredients this absorbed through the gastrointestinal epithelium to reach the target cell and produce the desired effect. In addition to better patient compliance, ODTs have been formulated for their potential in increasing the bioavailability of poorly water soluble drug through enhancing the dissolution profile of the drug.(4) As a drug comes to the end of its patent expiry, the development and formulation of the drug into new dosage forms allows pharmaceutical companies to extend the patent life and 'market exclusivity' . This allows to attract new consumers through advertisement, activities and product promotion plans, and increase profits in the long term.(5) The rapid ODT disintegration of the active substance comes in contact with the taste buds and the need for a pleasant taste and this a key aspect for patient palatability. Thus the taste-masking of bitter active substances is a critical obstacle to overcome for the successful development of ODT formulations. this review discusses the Ideal properties, advantages, disadvantages, challenges to develop, excipients used in preparation, important patented technologies, and evaluation parameters of Orodispersible tablets are emphasized .The objectives of this study are to produce a orodispersible tablet, which has patient compliance, sufficient hardness for handling and can be and equipment manufactured by commonly used production methods.(6)

Ideal Properties of Orodispersible Tablets

1. Easily dissolve or disperse in saliva within a few seconds.
2. Does not require water for oral administration.
3. Have a pleasant mouth feel
4. Leave negligible or no residue in the mouth when administered.
5. Portable and easy to transport.
6 Cost effective.
7 Able to be manufactured in a simple conventional manner within low cost.
8. Be less sensitive to environmental conditions like temperature, humidity etc.
9 It should be compatible with taste masking.

Advantages of Orodispersible Tablets

1. Improved compliance.
2. Cost effective.
3. No water needed.
4. No chewing needed.
5. Better taste.
6. Improved stability.
7. Suitable for controlled/sustained release actives.
8. Allows high drug loading.
9. Rapid drug therapy intervention.
10. Best for patent with oesophageal problems and have difficulties of deglutition tablets.
11. High drug loading is possible.
12. Have a acceptable taste and pleasant mouth feeling property helps to change the perception of medication as bitter pill particularly in pediatric patients.
13. The risk of chocking during oral administration of conventional formulations due to physical obstruction is avoided, thus providing improved safety.
14. Ease of administration to patients with oesophageal problems who cannot swallow, such as the aged, stroke victims and bedridden

patients; and who refuse to swallow, such as pediatrics, geriatric and psychiatric patients.

Disadvantage of Orodispersible Tablets

1. Rapid Disintegrating tablet is hygroscopic in nature so must be keep in dry place.
2. Sometime these tablets may leave unpleasant taste and/or grittiness in mouth if not formulated properly.
3. RDT requires special packaging for properly stabilization & safety of stable product.
4. These tablets usually have insufficient mechanical strength i.e. hence, careful handling required.

Challenges To Develop Orodispersible Tablets

1. Rapid disintegration of tablet.
2. Avoid increase in tablet size.
3. Have sufficient mechanical strength.
4. Minimum or no residue in mouth.
5. Protection from moisture.
6. Good package design.
7. Compatible with taste masking technology.
8. Not affected by drug properties

Excipients Used In Preparation of Orodispersible Tablets

The following excipients are used in preparation of ODTs:

1. Superdisintegrants

superdisintegrants are used in tablets to ensure the rapid break down into their primary particles, facilitating the dissolution or release of the active ingredients. Projectile has developed a versatile range of standard disintegration excipients. As the day's passes, demand for faster disintegrating formulation is increased. i.e. Superdisintegrants which have effective at small concentration and have greater disintegrating capacity and they are more effective intragranular. Superdisintegrants agents act by swelling and result of swelling pressure exerted in the outer direction direction, it causes the tablet to burst or the accelerated absorption of water then enormous increase in the volume of granules to promote disintegration. (7) The mechanism of disintegration is as shown in Figure no. (1).

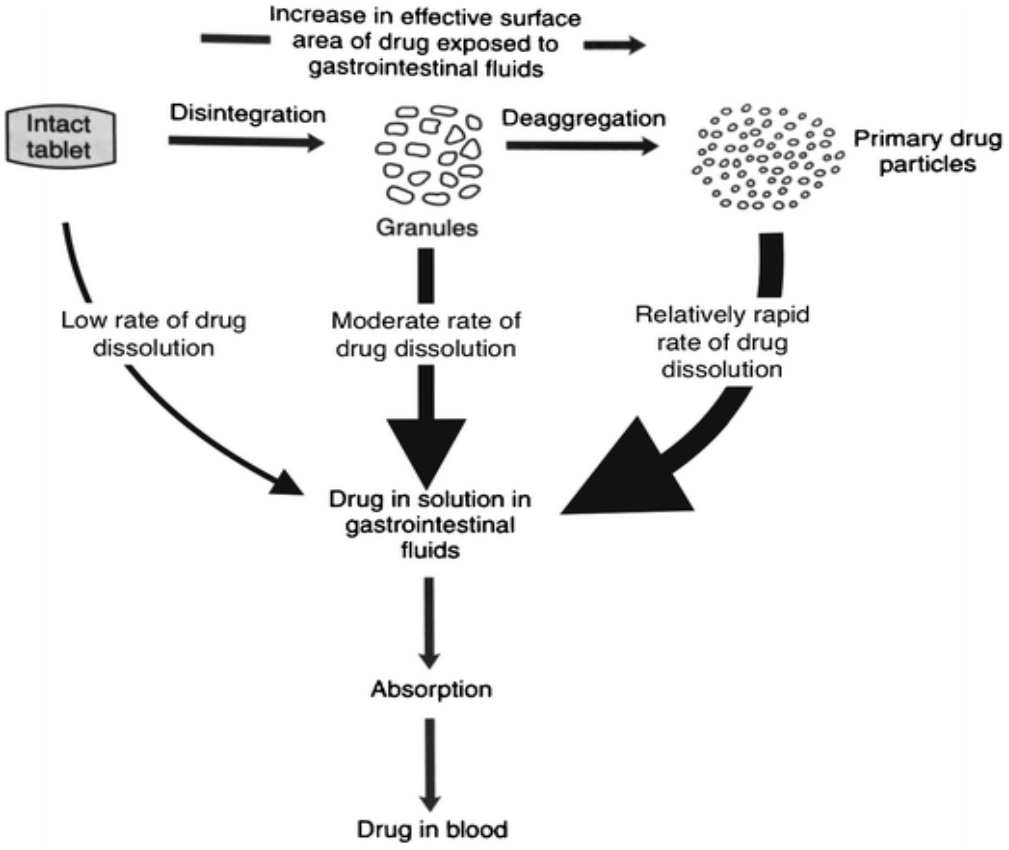

Figure (1): mechanism of disintegration

Various Types Of Superdisintegrants Used Are As Follows:

1. Crosspovidone
2. Microcrystalline cellulose
3. Sodium starch glycolate
4. Sodium carboxy methyl cellulose or cross carmellose sodium
5. Pregelatinzed starch
6. Calcium carboxy methyl cellulose
7. Modified corn starch, Sodium starch glycolate has good flowability than Cross carmellose sodium.

Factors to Be Considered For Selection of Superdisintegrants for Use:

1. It should be mouth dissolving when tablet meets saliva in the mouth
2. It should be compactable as enough to produce less-friable tablets.
3. It should able to produce a pleasant mouth feel to the patient. Thus, small particle size is preferred to acquire patient compliance.
4. It should have good flow since it improve the flowability of the total blend.

2. Taste Masking Agents

Taste masking agents are used for masking the bitter taste of drug. Taste- masking bitter or unpleasant tasting of drug substances is crucial factor for any orally- administered dosage form and patient compliance. Active pharmaceutical ingredients to be incorporated in taste masking Sugar based excipient are used for taste masking and as bulking agents. Most of the drugs are having unpleasant or bitter taste. And the basic requirement for designing ODTs is that the drug should not have unpleasant taste. So taste masking is necessary in most of the cases, xylitol, Sorbitol, mannitol, dextrose, fructose, etc. are mainly used. (8)

3. Binders

Tablet binders are used in the formulation of solid oral dosage forms to hold the active pharmaceutical ingredient and inactive ingredients together in a cohesive mix. Binder products are usually differentiated based on the manufacturing process to be used Binders commonly used are cellulosic polymers, povidones, polyvinyl alcohols, and acrylic polymers. Among the cellulosic polymers it will be advantageous to select ethylcellulose, hydroxyl propyl cellulose (HPC), and (HPMC), alone or in admixtures, and the most commonly acrylic polymers are used are the ammonio- methacrylate copolymer (Eudragit RL and RS), polyacrylate (Eudragit.NE), and polymethacrylate (Eudragit E). The selection of a right binder is essential to maintain the integrity and stability of the tablet. The temperature of the excipient should be preferably around 30–35^0 C for faster melting properties. Further, its addition imparts smooth texture and disintegration characteristics to the system.(9)

Methods Used For Preparation Of Orodispersible Tablets

1. Direct Compression

It is the simplest and most cost effective tablet manufacturing technique for ODTs as they can be fabricated using conventional tablet manufacturing and packaging machinery and also due to availability of tableting excipients with improved flow, compressibility and disintegration properties, especially tablet disintegrants, effervescent agents and sugar based excipients. A type of disintegrant and its proportion are of prime importance. There are number of factors which affect disintegration like particle size distribution, contact angle, pore size distribution, tablet hardness, water absorption capacity and type and proportion of disintegrants. FLASHTAB, a DC based technology contains coated crystals of drug and micro granules along with disintegrants. In this technology, two types of disintegrants are used: a disintegrating agent (e.g ., modified cellulose), which has a high swelling force and a swelling agent (e.g., starch, etc.) which has a low swelling force. A rapidly disintegrable multi particular tablet was prepared using carboxymethyl cellulose as disintegrating agent and swelling agent consisting of modified starch or microcrystalline cellulose. The disintegration time of this tablet was 60 sec (Cousin, et al, 1995).The evolution of carbon dioxide as a disintegrating mechanism forms the basis of another DC based technology called as ORASOLV. One of the processes describes the use of alginic acid and a water-soluble metal carbonic acid to prepare tablets (J. Machalson, 1983). An acidbase reaction occurs when they are dissolved in water. The salt causes the tablet to swell and the carbonic acid produced carbon dioxide within the swelling tablet so that rapid disintegration can be possible. Similarly, the use of sugar-based recipients like dextrose, fructose, isomalt, lactitol, maltitol, maltose, mannitol, sorbitol, starch hydrolysate, polydextrose and xylitol is appreciated in masking the bad taste of the tablets and impart sweetness while formulating OD tablets. A process, in which water is sublimated from the product after freezing, is called freeze drying. Freeze - dried forms provides more rapid dissolution than other available solid products. The lyophilization process imparts glossy amorphous structure to the bulking agent and

sometimes to the drug, thereby enhancing the dissolution characteristics of the formulation.(10)

2. Melt Granulation:

Melt granulation technique is in which pharmaceutical powders are efficiently agglomerated by a meltable binder. The advantage of this technique compared to a conventional granulation technique is that no water or organic solvents are required. Because there is no drying step involved, the process is less time consuming and uses less energy than wet granulation. Melt Granulation useful technique to increase the dissolution rate of poorly water-soluble drugs, This approach to formulate ODT with sufficient mechanical integrity, involves the use of a hydrophilic waxy binder it act as a binder and enhance the physical resistance of tablets but will also help the disintegration of the tablets as it melts in the mouth and solublises rapidly leaving no residues.(11)

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3. Effervescent Method

Effervescent method used by mixing sodium bicarbonate and tartaric acid or citric acid of concentration 12% (w/w) along with super disintegrants like pregelatinized starch, sodium starch glycolate, crospovidone, and croscarmellose to formulate ODTs. The sodium bicarbonate and tartaric acid were preheated first at a temperature of 80°c to remove residual moisture and thoroughly mixed in the motor. Finally, the blends are compressed in the punch.(12)

4. Tablet Molding

Tablets produced by molding are solid dispersions. The physical form of drug in the tablets depends whether and to what extent, it dissolves in the molten carrier. The drug can exist as discrete small particles dispersed in the matrix. It can dissolve totally in the molten carrier to produce solid solution or dissolve partially in the molten carrier and the remaining particles stay undissolved and dispersed in the matrix. Disintegration time, drug dissolution rate and mouth feel will depend on the type of dispersion or dissolution in this method.(13)

5. Fast Dissolving Films

It is a new frontier in ODTs that provides a very convenient means of taking medications and supplements. In this technique, a non-aqueous solution is prepared containing water soluble film forming polymer like pullulan, carboxymethylcellulose, hydroxypropyl methylcellulose, hydroxyl ethylcellulose, hydroxyl propylcellulose, polyvinyl pyrrolidone, polyvinyl alcohol, or sodium alginate, etc.), drug and taste masking ingredients, which is allowed to form a film after evaporation of solvent.(14) For the bitter drug, coated microparticles of the drug can be incorporated into the film. This film, placed in mouth, melts or dissolves rapidly, releasing the drug in solution or suspension form. In this system paper thin films of size <2×2 inches, dissolution in 5 seconds, instant drug delivery and flavored after taste. (15)

6. Mass Extrusion

Mass extrusion technology involved the active blend using the solvent mixture of water-soluble polyethylene glycol and methanol and subsequent expulsion of softened mass through the extruder to get a cylinder of the product into even segments using heated blade to form tablet. The dried cylinder used to coat granules for bitter drugs and to achieve taste masking.(16)

7. Nanonization

The nano melt technology involves a reduction in the particle size of drug to nanosize by milling the drug using a proprietary wet-milling technique. The nanocrystals of the drug are stabilized against agglomeration by surface adsorption process on selected stabilizers, which are then incorporated into ODTs. This technique is, especially advantageous for poorly, water soluble drugs. and this technology include fast disintegration of nanoparticles leading to increased absorption and hence the higher bioavailability and reduction in dose, cost effective manufacturing process, conventional packaging, and wide range of doses (up to 200 mg of drug per unit).(17)

Important Patented Technologies Of Orodispersible Tablets

1. Zydis Technology

Zydis® technique is owned by Scherer, a subsidiary of Cardinal Health. Zydis formulation is a unique freeze dried tablet in which drug is physically entrapped in the matrix of fast dissolving carrier material. When zydis formulation are put into the mouth, the freeze-dried structure disintegrates instantaneously and does not require water to aid swallowing. The zydis matrix is composed of many material designed to achieve a number of objectives. Matrix is made up of gelatin, dextran or alginates to impart strength during handling these form a glossy and amorphous structure, mannitol or sorbitol is added to impart crystallinity, elegance, and hardness, various gums may be added to prevent sedimentation of dispersed drug particles These form a glossy amorphous structure, which imparts strength. To obtain elegance, crystallinity and hardness, saccharides such as mannitol or sorbitol are

incorporated. Water is used for manufacturing process to ensure production of porous units to achieve rapid disintegration while various gums are used to prevent sedimentation of dispersed drug particles in the manufacturing process. The Zydis product is made to dissolve on the tongue in 2-3 seconds. Collapse protectants such as glycine prevent the shrinkage of zydis units during freeze -drying process or long-term storage. Zydis products are packed in blister packs to protect from moisture in the environment.(18)

2. Durasolv Technology

Durasolv is the patented technology of CIMA labs. In this technology tablets made of drug, filler and a lubricant. Tablets are prepared by using conventional tableting equipment and have good rigidity. These can be packaged into conventional packaging system like blisters, strips. Durasolv Technology is an appropriate technology for product requiring low amounts of active ingredients i.e. potent drugs.(19)

3. Lyoc

Lyoc technology is owned by Cephalon Corporation. Lyoc technology is compatible with CIMA taste-masking techniques, customized release, high dosing and fixed-dose combination products Lyoc technology lyophilizes, or "freeze-dries" an aqueous solution, suspension, or emulsion of an API and excipients. Lyoc's high degree of porosity yields shorter disintegration times than compressed tablets. This was the first freeze drying- based technology introduced for ODTs. Oil in water emulsion is prepared and placed directly into blister cavities and followed by freeze-drying. The Non-homogeneity during freeze-drying is avoided by incorporating inert filler to increase the viscosity finally the sedimentation. The Lyoc technology produces a stable product without use of additives, preservatives or gelatins. This Lyoc technology process is environmentally friendly and cost-effective because it doesn't require organic solvents.

4. Orasolv Technology

OraSolv was CIMA's first orodispersible dosage form. In this process active ingredients is taste masked, It contains effervescent disintegrating agent. The disintegration of tablet in the mouth is cause by the action of an effervescent agent, activated by saliva. In this process effervescent agent is in general about 20-25% of the total weight of the tablet. Tablets are formulate by direct compression technique at low compression force in order to minimize oral dissolution time. Conventional blenders and tablet machine is used to produce the ODTs. This tablets produced are soft and friable and packaged in specially designed pick and place system.

5. Wow Tab Technology

The WOWTAB signifies the tablet is to be given without water. In this technology utilizes sugar and sugar-like excipients. The two different types of saccharides are combined for adequate hardness and fast dissolution rate. The two different saccharides are those with high moldability like maltose, mannitol, sorbitol, and oligosaccharides. (good binding property) and low moldability like lactose, glucose, mannitol, xylitol (rapid dissolution). Tablet produced from this technology will have sufficient hardness to maintain the physical characteristics of the dosage form during production until it comes in contact with moisture such as saliva in mouth. Due to the significant hardness the WOWTAB formulation is more stable to the environment than the Zydis and Orasolv. Erythritol was the best sugar for formulation, showing rapid disintegration which is unaffected by tablet hardness.(20)

6. Oraquick Technology

The Oraquick Technology is patented taste for masking technology, for taste masking process does not utilize solvents of any kind, so leads to faster and more efficient production. This technique is not suitable for heat sensitive drugs because during processing low-heat is produced so. KV Pharmaceuticals also claims that the matrix that surrounds and protects the drug powder in microencapsulated particle is more flexible. Oraquick technique gives tablets with good taste masking and quick dissolution.(21)

7. Flashtab Technology

flashtab technology is patented by prographarm laboratories. In this technology tablets produces by compression of granular excipients. Flashtab technology uses the same excipients as do conventional compressed tablets. Excipients used in this technology is disintegrating agents, such as carboxymethylcellulose and swelling agents, such as carboxymethylcellulose, starch, modified starch, carboxymethylated starch, microcrystalline cellulose, and possibly directly compressible sugars. The excipients mixture is prepared by either dry or wet granulation methods. The tablets produced by this technology are known to have satisfactory physical resistance and disintegrate in the mouth within 1 minute.(22)

8. Pharmaburst Technology

SPI Pharma, New Castle, have the patent of this technology. Pharmaburst Technology is a "Quick

Dissolve" delivery system It utilizes the co-processed excipients which involves a dry blend of a drug, flavors, and lubricant then followed by compression into tablets which dissolves within 30- 40 s. Tablets obtained have sufficient strength so they can be packed in blister packs and bottles.(23)

Evaluation Of Orodispersible Tablets

1. Size And Shape

The size and shape of the tablet can be dimensionally described, monitored and controlled.

2. Hardness / Crushing Strength

Hardness of tablet is defined as the force applied across the diameter of the tablet in the order to break the tablet. The resistance of the tablet to chipping, breakage under the condition of storage transformation and handling before usage depends on its hardness. Hardness of the tablet of each formulation was determined using Monsanto Hardness tester. The hardness of ODTs is generally kept lower than conventional tablets because increased hardness delays the disintegration of the tablet. The force is measured in kg and the hardness of about 3-5 kg/cm2 is considered to be satisfactory for uncoated tablet.(24)

3. Thickness

Tablet thickness can be measured using a simple procedure. 5 tablets were taken and their thickness was measured using Varnier calipers and average values were calculated. It is expressed in mm.

4. Friability

Friability of dosage form evaluated for loss of weight of tablet in the container due to removal of fine particles from the surface. this test is carried out to access the ability of the tablet to withstand abrasion in packaging, handling and transport. Friability of the tablets were determined using Roche Friabilator and is expressed in percentage (%). [31]. The weight of ten tablets were initially weighed (W initial) and placed into the friabilator. The friabilator was operated at 25 rpm for 4 minutes or run up to 100 revolutions and then the tablets were weight again (W final). The loss in tablet weight due to abrasion or fracture was the measure. Percent friability (f) was calculated by using the following formula.

$$F = \frac{W\ initial) - W\ (final)}{W\ (initial)} \times 100$$

% friability of less than 1 % is considered acceptable.

5. Wetting Time

In wetting time evaluation, a piece of tissue paper (12 cm × 10.75 cm) folded twice was placed in a small Petridish (ID = 9 cm) containing 6 ml pH 6.8 phosphate buffer, a tablet was placed on the paper and the time taken for complete wetting was note. Three tablets from each formulation were randomly selected and the average wetting time was noted. Schematic diagram of determination of wetting time is shown in Figure no. (2).

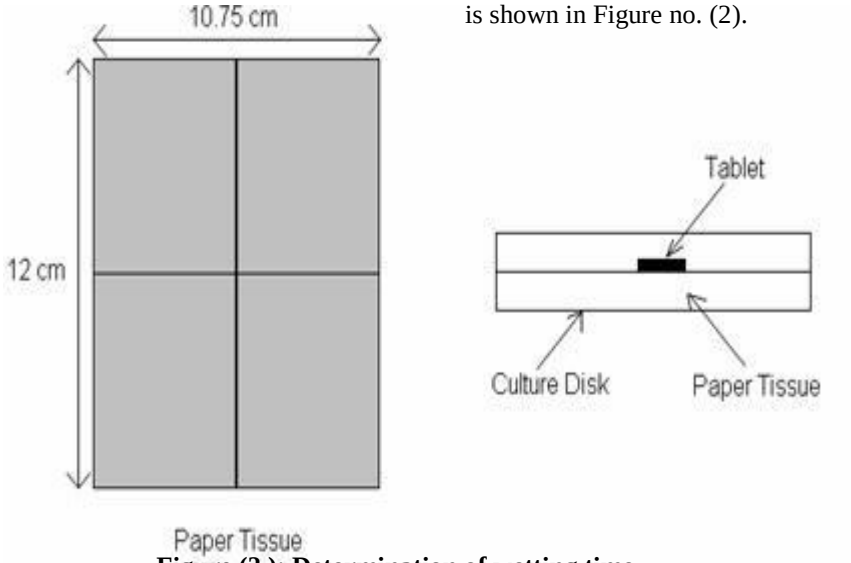

Figure (2): Determination of wetting time

6. Disintegration Time

In vitro evaluation of oral dosage form disintegration time is very important. This test was carried out on 6 tablets using the apparatus specified in I.P-1996 distilled water at 37°C ±2°C was used as a disintegration media and the time in second taken for complete disintegration of the tablet with no palatable mass remaining in the apparatus was measured in seconds.(27)

7. Mouth Feel

To know mouth feel of ODTs, to evaluate mouth feel the selected human volunteers were given placebo tablets and the taste sensation felt was evaluated.(28)

8. Weight Variation

This test performed for solid dosage form. Weight variation followed I.P. procedure for uniformity of weight, twenty tablets were taken and their weight was determined individually and collectively on a weighing balance. The average weight of one tablet was determined from the collective weight. The weight variation test would be a satisfactory method of determining the drug content uniformity. 20 tablets were selected randomly to check for weight variation.(28) Weight variation specification as per I.P. is shown in Table no. (1)

Table no . (1): Average e weight of tablet and % accepted deviation

Average weight of tablet	% Accepted deviation
80 mg or less	10
More than 80 mg but less than 250 mg	7.5
250 mg or more	5

9. Tablet Porosity

The mercury penetration porosimeter can be used for measure the tablet porosity. The tablet porosity (ε) can be calculated by using following equation,

$\varepsilon = 1\text{-}m / (\rho t V)$

Where ρ t is the true density, and m and V are the weight and volume of the tablet, respectively.(29)

10. Content Uniformity

The test for uniformity of content is based on the assay of the individual content of drug substance(s) in a number of individual dosage units to determine whether the individual content is within the limit. The test for content uniformity is required for tablets containing <25 mg or <25% of one tablet. The content of active ingredient is determined in each of 10 dosage units taken at random using method described in assay. The preparation complies with the test if individual content is 85-115% of average content (30)

11. Dissolution Test

It is an important test as the drug-release profile can be obtained by performing this test. Both the USP dissolution test apparatus can be used. Dissolution of orodispersible tablets is very fast.(31) Therefore USP 2 Paddle-type apparatus at 50-100 r/minutes. 0.1N HCl, pH 4.5 and pH 6.8 buffers should be used for dissolution testing. USP Type I basket apparatus have certain application in the case of orodispersible tablets, but tablet fragments or disintegrated tablet masses may become trapped on the inside top of the basket at the spindle. An erroneous-dissolution profile may is obtained, where little or no effective stirring occurs. Thus, Type II is more preferred due to reproducible-dissolution profile(32)

. **Table No (2) : Marketed Product Of Orodispersible Tablets**

Brand name	Active Ingredient	Application	Company
Zofran® ODT	Olandansetron	Antiemetic	Galaxo Smith kline
Feldene Melt®	Piroxicam	NSAIDs	Pfizer
Maxalt® -MLT®	Rizatritpan benzoate	Migrane	Merck
Zyperxa®	Olazepine	Psychotropic	Eli Lilly
Imodium Istant Melts	Loperamide HCL	Antidiarrheal	Jannsen
Klonopin® wafer	Clonazepam	Sedation	Roche

CONCLUSION:

The popularity of ODTs has increased enormously over the last decade. Based on the literature surveyed, it may be concluded that Orodispersible tablets are particularly beneficial to the pediatric, geriatric, bedridden, and psychotic patients affected by dysphagia. ODTs get converted into solution or suspension with the salivary fluid in the oral cavity thereby showing rapid onset of action with improved bioavailability, better patient acceptance and offer better safety as compared to conventional oral dosage forms. Today, Orodispersible tablets are more widely available as over-the-counter products for the treatment of allergies, cold and flu symptoms. In future ODTs may be most acceptable and prescribed tablet dosage form due to its fast action (within minute). Their advantages such as administration without water needed, anywhere, at anytime lead to their enhanced patient compliance in today's scenario of hectic life. All the information's collected above about the ODTs gives a better scientific based understanding. pharmaceutical companies can take advantage of ODTs for product line extensions With continued development of new pharmaceutical excipients, one can expect the emergence of more novel technologies for ODTs in the days to come.

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REFERENCES:

1) Pahwa, R., Piplani, M., Sharma, P.C., Kaushik, D. and Nanda, S., 2010. Orally disintegrating tablets-Friendly to pediatrics and geriatrics. *Archives of applied science research*, *2*(2), pp.35-48.
2) Jain, D. and Amul, M., 2014. A Review-Formulation & Development of Orodispersible Tablet. *International Journal of Pharmaceutical Erudition*, *4*(1), pp.30-31.
3) Bandari, S., Mittapalli, R.K. and Gannu, R., 2014. Orodispersible tablets: An overview. *Asian Journal of Pharmaceutics (AJP): Free full text articles from Asian J Pharm*, *2*(1).
4) Reddy, B.V.M., 2011. *Development and evaluation of aceclofenac fast disintegrating tablets using superdisintegrates and solid dispersion technique* (Doctoral dissertation, RGUHS).
5) Scherer, F.M., 1993. Pricing, profits, and technological progress in the pharmaceutical industry. *Journal of Economic Perspectives*, *7*(3), pp.97-115.
6) Bhusnure, O.G., Shaikh, F.E., Sugave, B.K., Kavale, B.S., Sayyed, R.A. and Hucche, B.S., 2015. FORMULATION STRATEGIES FOR TASTE-MASKING OF CHEWABLE TABLETS. *American Journal of Pharmaceutical Research*, *5*(12).
7) Khan, F.A., Narasimhan, K., Swathi, C.S.V., Mustak, S., Mustafa, G., Ahmad, M.Z. and Akhter, S., 2018. 3D Printing Technology in Customized Drug Delivery System: Current State of the Art, Prospective and the Challenges. *Current pharmaceutical design*.
8) Fu, Y., Yang, S., Jeong, S.H., Kimura, S. and Park, K., 2004. Orally fast disintegrating tablets: developments, technologies, taste-masking and clinical studies. *Critical reviews in therapeutic drug carrier systems*, *21*(6), pp.433-476.
9) Patel, H., Shah, V. and Upadhyay, U., 2011. New pharmaceutical excipients in solid dosage forms-A review. *International Journal of Pharmacy & Life Sciences*, *2*(8).
10) Patel, N.V., Chotai, N.P. and Patel, M.P., 2014. Formulation design of oxcarbazepine fast-release tablets prepared by melt granulation technique. *Asian Journal of Pharmaceutics (AJP): Free full text articles from Asian J Pharm*, *2*(1).
11) Shanmugam, S., 2015. Granulation techniques and technologies: recent progresses. *BioImpacts: BI*, *5*(1), p.55.(11)
12) Thakur, R.R. and Kashi, M., 2011. An unlimited scope for novel formulations as orally disintegrating systems: Present and future prospects. *J Appl Pharm Sci*, *1*(1), pp.13-9.
13) Patil, P.B., More, V.N. and Tour, N.S., 2015. Recent trends in orodispersible tablets–An overview of formulation technology and future prospects. *International Journal of Pharma Sciences and Research*, *6*(7), pp.1056-1066.
14) Nayak, A.K. and Manna, K., 2011. Current developments in orally disintegrating tablet technology. *Journal of Pharmaceutical Education and Research*, *2*(1), p.21.
15) Ali, A.A., Charoo, N.A. and Abdallah, D.B., 2014. Pediatric drug development: formulation considerations. *Drug development and industrial pharmacy*, *40*(10), pp.1283-1299.
16) Shukla, D., Chakraborty, S., Singh, S. and Mishra, B., 2009. Mouth dissolving tablets I: An overview of formulation technology. *Scientia Pharmaceutica*, *77*(2), pp.309-326.
17) Bikiaris, D.N., 2011. Solid dispersions, part I: recent evolutions and future opportunities in manufacturing methods for dissolution rate enhancement of poorly water-soluble

drugs. *Expert opinion on drug delivery*, *8*(11), pp.1501-1519.
18) Badgujar, B. and Mundada, A., 2011. The technologies used for developing orally disintegrating tablets: a review. *Acta pharmaceutica*, *61*(2), pp.117-139.
19) Wagh, M.A., Kothawade, D.P., Salunkhe, K.S., Chavan, N.V. and Daga, V.R., 2010. Techniques used in orally disintegrating drug delivery system. *International journal of drug delivery*, *2*(2).
20) Manyikana, M., Choonara, Y.E., Tomar, L.K., Tyagi, C., Kumar, P., du Toit, L.C. and Pillay, V., 2016. A review of formulation techniques that impact the disintegration and mechanical properties of oradispersible drug delivery technologies. *Pharmaceutical development and technology*, *21*(3), pp.354-366.
21) E Leucuta, S., 2012. Drug delivery systems with modified release for systemic and biophase bioavailability. *Current clinical pharmacology*, *7*(4), pp.282-317.
22) Prajapati, B.G. and Ratnakar, N., 2009. A review on recent patents on fast dissolving drug delivery system. *International Journal of PharmTech Research*, *1*(3), pp.790-798.
23) Saharan, V.A., 2017. Modifications in Conventional Tablet Compaction Technologies for Developing Fast Dissolving/Disintegrating Tablets. *Current Advances in Drug Delivery Through Fast Dissolving/Disintegrating Dosage Forms*, p.41.
24) Ratnaparkhi, M.P., Mohanta, G.P. and Upadhyay, L., 2009. Review on: Fast dissolving tablet. *Journal of pharmacy research*, *2*(1), pp.5-12.
25) Nagar, P., Singh, K., Chauhan, I., Verma, M., Yasir, M., Khan, A., Sharma, R. and Gupta, N., 2011. Orally disintegrating tablets: formulation, preparation techniques and evaluation. *Journal of Applied Pharmaceutical Science*, *1*(04), pp.35-45.
26) Randale, S.A., Dabhi, C.S., Tekade, A.R., Belgamwar, V.S., Gattani, S.G. and Surana, S.J., 2010. Rapidly disintegrating tablets containing taste masked metoclopramide hydrochloride prepared by extrusion–precipitation method. *Chemical and Pharmaceutical Bulletin*, *58*(4), pp.443-448.
27) Ashish, P., Harsoliya, M.S., Pathan, J.K. and Shruti, S., 2011. A review-formulation of mouth dissolving tablet. *International journal of pharmaceutical and clinical science*, *1*(1), pp.1-8.
28) Maniruzzaman, M., Boateng, J.S., Chowdhry, B.Z., Snowden, M.J. and Douroumis, D., 2014. A review on the taste masking of bitter APIs: hot-melt extrusion (HME) evaluation. *Drug development and industrial pharmacy*, *40*(2), pp.145-156.
29) Saroha, K.A.M.A.L., Kumar, G.A.U.T.A.M. and Paul, Y.A.S.H., 2013. Formulation and evaluation of fast dissolving tablets of amoxicillin trihydrate using synthetic superdisintegrants. *Int J Pharm Bio Sci*, *4*(1), pp.254-62.
30) Park, J.B., Kang, C.Y., Kang, W.S., Choi, H.G., Han, H.K. and Lee, B.J., 2013. New investigation of distribution imaging and content uniformity of very low dose drugs using hot-melt extrusion method. *International journal of pharmaceutics*, *458*(2), pp.245-253.
31) Dey, P. and Maiti, S., 2010. Orodispersible tablets: A new trend in drug delivery. *Journal of natural science, biology, and medicine*, *1*(1), p.2.
32) Thakur, R.R. and Kashi, M., 2011. An unlimited scope for novel formulations as orally disintegrating systems: Present and future prospects. *J Appl Pharm Sci*, *1*(1), pp.13-9.