INTERNATIONAL JOURNAL OF PHARMACOGNOSY AND CHEMISTRY
Content available at www.saap.org.in Online ISSN: 2582-7723

Open Access Review Article

A COMPREHENSIVE REVIEW ON ORODISPERSIBLE TABLTES

N. SHARON*, A. CHANDANA B. GAYATHRI, CHANDU BABU RAO

Priyadarshini Institute of Pharmaceutical Education and Research, 5TH Mile, Pulladigunta, Guntur-522017, Andhra Pradesh, India.

ARTICLE HISTORY

Received on: 26-02-2026
Revised on: 11-03-2026
Accepted on: 27-03-2026

***Keywords*:** Oro-dispersible tablets, superdisintegrants, bioavailability enhancement, pediatric and geriatric patients, sublimation technique, spray drying technique.

***CORRESPONDING AUTHOR**
N. Sharon

ABSTRACT

In the pharmaceutical industry oral route is considered as the safest and convenient route. Oro-dispersible tablets (ODTs) are solid dosage forms containing drugs that disintegrate in the oral cavity within less than 1 minute leaving an easy to swallow residue. This dosage form contains super disintegrants which imparts quick disintegration with presence of saliva and can be swallowed easily. ODTs are the very good choice for the paediatric and geriatric patients. To improve the bioavailability of many drugs, Oro dispersible drug delivery systems are used extensively. In recent past, several manufacturing technologies such as sublimation technique, spray drying technique etc. are employed to overcome the limitations of conventional tablet dosage forms. The mouth dissolving tablets must undergo a variety of evaluations after they are created in order to ensure their long-term stability and improved therapeutic effectiveness.

1. INTRODUCTION

The oral route is the most common and preferred route for drug administration for both solid and liquid dosage forms. Among these, solid dosage forms are widely used due to ease of administration, accurate dosing, self-medication, pain avoidance, and improved patient compliance [1].

Tablets and capsules are the most popular solid dosage forms. However, many patients experience difficulty in swallowing conventional tablets and hard gelatin capsules. This condition is known as **dysphagia**.

To overcome this limitation, **orodispersible tablets (ODTs)** were developed [2].

ODTs are uncoated tablets that rapidly disperse or disintegrate in the mouth without the need for water. They are also known as:

- Mouth-dissolving tablets
- Fast-dissolving tablets
- Rapid-dissolving tablets
- Quick-dissolving tablets
- Melt-in-mouth tablets

According to the U.S. FDA, ODTs are solid dosage forms containing active pharmaceutical ingredients that disintegrate rapidly in the mouth within seconds when placed on the tongue. Upon contact with saliva, they release the drug, improving onset of action and, in some cases, bioavailability due to pre-gastric absorption [3].

2. HISTORY OF ODTS [4]

The development of ODTs was led by companies such as **Cima Labs (USA)** and **Takeda Pharmaceutical Company (Japan)**.

The first ODT approved by the U.S. FDA was **Claritin (loratadine)** in December 1996, followed by:

- **Klonopin (clonazepam)** in 1997
- **Maxalt (rizatriptan)** in 1998

ODTs were introduced to improve patient compliance and provide rapid therapeutic action, especially for drugs undergoing extensive first-pass metabolism.

Recent Evolution

Modern advancements include:

- 3D printing for personalized dosage forms
- Use of novel superdisintegrants
- Improved taste-masking technologies

- Enhanced formulation techniques for better stability and performance

3. IDEAL PROPERTIES OF ODTS

- Pleasant mouth feel and effective taste masking
- Cost-effective manufacturing
- Compatibility with conventional packaging methods
- Rapid drug absorption, especially via pre-gastric routes
- High patient acceptability [5-6].

4. SALIENT FEATURES

- Suitable for pediatric, geriatric, psychiatric, bedridden, and dysphagic patients
- Rapid onset of action due to quick disintegration and dissolution
- Improved patient compliance
- Better taste masking enhances acceptability, especially in children

5. SUPERDISINTEGRANTS

Superdisintegrants are essential excipients that enhance tablet breakup.

A. Natural Superdisintegrants

- Starch
- Guar gum
- Plant-based gums

They are inexpensive, biocompatible, non-toxic, and eco-friendly.

B. Synthetic Superdisintegrants

- Crospovidone
- Sodium starch glycolate
- Croscarmellose sodium
- Chitosan (biopolymer-based)

6. Techniques For Preparation Of Odts

Freeze Drying (Lyophilization) [7-8].

Water is removed by sublimation after freezing. It produces highly porous tablets with rapid dissolution but low mechanical strength and poor stability at high temperature and humidity.

Direct Compression

The simplest and most economical method using directly compressible excipients and superdisintegrants. Requires good flow and compressibility.

Sublimation

Volatile substances such as camphor are used and later sublimated to create porous structures, improving disintegration.

Tablet Molding

Tablets are prepared using soluble ingredients. They have good mouth feel but poor mechanical strength.

Spray Drying

A solution containing drug and excipients is spray-dried to produce porous powder that rapidly dissolves [9-10].

Cotton Candy Process

Uses shear form technology to create floss-like matrix using sugars or polysaccharides, resulting in rapid disintegration.

Phase Transition Process

Involves sugar alcohols (e.g., erythritol, xylitol) that melt and recrystallize to improve porosity and hardness.

Melt Granulation

Uses low-melting binders that act as adhesives during heating, forming granules without solvents.

Effervescent Method

Uses acid-base reaction (e.g., sodium bicarbonate + citric/tartaric acid) to release CO_2, promoting rapid disintegration.

5.1 Excipients Used

- PVP K-30 (binder)
- Sodium bicarbonate (effervescent agent)
- Mannitol (diluent, improves mouth feel)

7. MECHANISM OF SUPERDISINTEGRANTS

- **Capillary action:** Water enters tablet pores and replaces air
- **Gas release:** Effervescence produces CO_2, breaking the tablet
- **Deformation recovery:** Swelling of disintegrants causes breakup of tablet [10-12].

8. EVALUATION OF ODTS

Weight Variation

Ensures uniformity in tablet weight.

Hardness

Measured using Monsanto hardness tester.

Friability

Measured using Roche friabilator; assesses mechanical strength [13].

Content Uniformity

Ensures uniform drug distribution across tablets.

Wetting Time

Measures time required for complete wetting of the tablet.

In-vitro Dissolution

Performed using USP Type II apparatus in simulated salivary fluid (pH 6.8) [14].

9. ADVANTAGES

- High drug loading capacity
- Rapid onset of action
- Improved patient compliance
- Minimal residue in mouth [15-17].

10. DISADVANTAGES

- Fragile and sensitive to handling
- Limited drug loading capacity
- Requires specialized packaging for protection [18].

11. APPLICATIONS

- Treatment of dysphagia patients
- Pediatric and geriatric therapy
- Fast relief medications (cold, flu, allergies)
- Development of patient-friendly formulations [19].

12. LIMITATIONS

- Low mechanical strength
- Not suitable for all drugs (e.g., anticholinergics)
- Limited drug loading capacity

13. FUTURE PROSPECTS

Future developments aim to:

- Reduce manufacturing costs
- Improve mechanical strength
- Enhance taste masking
- Develop advanced packaging systems
- Enable large-scale production using standard equipment [20].

14. CONCLUSION

ODTs have significantly improved patient compliance, especially for pediatric, geriatric, and dysphagic patients. Their ability to disintegrate rapidly in the mouth provides faster therapeutic effects and improved convenience. Continuous advancements in formulation technology are expected to further enhance their effectiveness, stability, and commercial viability.

15. AUTHOR CONTRIBUTIONS

All authors are contributed equally.

16. FINANCIAL SUPPORT

None

17. DECLARATION COMPETING INTEREST

The authors have no conflicts of interest to declare.

18. ACKNOWLEDGEMENTS

None

19. REFERENCES

1. Nama S, Chandu BR, Awen BZ, Khagga M. Development and validation of a new RP-HPLC method for the determination of aprepitant in solid dosage forms. *Trop J Pharm Res*. 2011 Aug;10(4). https://www.ajol.info/index.php/tjpr/article/view/69565
2. Gindi S, Methra T, Chandu BR, Boyina R, Dasari V. Antiurolithiatic and in vitro antioxidant activity of leaves of *Ageratum conyzoides* in rat. *World J Pharm Pharm Sci*. 2013;2:636–649. https://www.researchgate.net/profile/Revathi-Boyina/publication/251566463
3. Vijayalakshmi P, Girish C, Mentham R, Rao CB, Nama S. A review on Alzheimer's disease. *Int J Pharma Biosci*. 2014 Apr;4(2):19–27.
4. Gandhi L, Akhtar S. Comparative study on effect of natural and synthetic superdisintegrants in orodispersible tablets. *J Drug Deliv Ther*. 2019 Mar;9(2):507–513. https://doi.org/10.22270/jddt.v9i2.2404
5. Panda SA, Hemalatha NO, Shankar PU, Baratam SR. Formulation and evaluation of orodispersible tablets of diclofenac sodium. *Int J App Pharm*. 2019;11(6):190–197. http://dx.doi.org/10.22159/ijap.2019v11i6.33480
6. Reshma KJ, Senthila S. Superdisintegrants and their role in orodispersible tablets. *Int J Res Rev*. 2020;7:462–471.
7. Valleri M, Mura P, Maestrelli F, Cirri M, Ballerini R. Fast dissolving tablets using solid dispersion technique. *Drug Dev Ind Pharm*. 2004 Jan;30(5):525–534. https://doi.org/10.1081/DDC-120037484
8. Seager H. Drug-delivery products and the Zydis fast-dissolving dosage form. *J Pharm Pharmacol*. 1998 Apr;50(4):375–382. https://doi.org/10.1111/j.2042-7158.1998.tb06876.x
9. Hirani JJ, Rathod DA, Vadalia KR. Orally disintegrating tablets: a review. *Tropical Journal of Pharmaceutical Research*. (Year not provided). http://www.tjpr.org
10. Chandrasekhar R, Hassan Z, AlHusban F, Smith AM, Mohammed AR. Role of excipients in lyophilised fast-disintegrating tablets. *Eur J Pharm Biopharm*. 2009 May;72(1):119–129. https://doi.org/10.1016/j.ejpb.2008.11.011
11. Mishra DN, Bindal M, Singh SK, Kumar SG. Spray dried excipient base for orally disintegrating tablets. *Chem Pharm Bull*. 2006;54(1):99–102. https://doi.org/10.1248/cpb.54.99
12. Gupta A, Mishra AK, Gupta V, Bansal P, Singh R, Singh AK. Fast dissolving tablet formulation technology: an overview. *Int J Pharm Biol Arch*. 2010;1(1):1–10.
13. Sunada H, Bi Y. Preparation and evaluation of rapidly disintegrating tablets. *Powder Technol*. 2002;122(2–3):188–198. https://doi.org/10.1016/S0032-5910(01)00415-6
14. Morita Y, Tsushima Y, Yasui M, et al. Evaluation of disintegration time of rapidly disintegrating tablets using CCD camera. *Chem Pharm Bull*. 2002;50(9):1181–1186. https://doi.org/10.1248/cpb.50.1181

15. Yalkowsky SH, Banerjee S. Aqueous solubility: methods of estimation for organic compounds. 1992. https://lccn.loc.gov/91041408
16. Cirri M, Rangoni C, Maestrelli F, Corti G, Mura P. Fast-dissolving tablets of flurbiprofen-cyclodextrin complexes. *Drug Dev Ind Pharm*. 2005;31(7):697–707. https://doi.org/10.1080/03639040500253694
17. Mehta K, Garala K, Basu B, Bhalodia R, Joshi B, Charyulu RN. Rapid disintegrating tablets: emerging oral drug delivery technology. (Source not fully provided).
18. Yalkowsky SH, Banerjee S. Aqueous solubility: methods of estimation. 1992. https://lccn.loc.gov/91041408
19. Sandeep Yadav SY, Sharma PK, Goyal NK. Comparative study of mucilage from Cassia fistula and gum Karaya. (Journal details incomplete).
20. Kumar N, Pahuja S. Dispersible tablets: an overview. *J Med Pharm Allied Sci*. 2019;8(3):2183–2199.