

Orally disintegrating tablets (ODTs): An innovative approach to tablet formulations

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Introduction

Orally disintegrating tablets (ODTs) are solid dosage forms that disintegrate without the addition of extra water, usually less than a minute in the mouth into a paste that can be easily swallowed. ODTs have improved over the past years, in an attempt to produce a safe and efficient substitute to the conventional oral dosage forms. They are new types of dosage forms which mediate the advantages of both solid and liquid types of drug formulations such as ease of use and being stable. Thanks to these properties, the orally disintegrating tablets are considered a good alternative in both pediatric and geriatric therapy. Orally disintegrating mini-tablets (ODMTs), which combine the advantageous properties of ODTs and mini-tablets for pediatric therapy, are defined as new drug delivery systems. Therefore, ODMTs can also be defined as advanced and compact forms of ODTs for pediatric patients. In this paper, advantages, ideal properties and desired characteristics of ODTs formulations processes and future research trends in ODT technology will be told.

Advantages of ODTs

ODTs are especially convenient for patients, who have difficulties in swallowing conventional solid dosage form. ODTs include the following:

- Pediatric and geriatric populations who have complication in swallowing of tablets and capsules.
- ODTs are suitable dosage forms for during the journey, patients with permanent nausea.
- Antipsychotic drug molecules can be more easily applied to schizophrenic patients by ODTs than

traditional pharmaceutical forms (Comoglu and Ozyilmaz, 2019).

- The risk of choking or suffocation during oral administration of conventional formulations due to physical obstruction is avoided, thus providing improved safety (Indurwade and Biyani, 2000).
- Good mouth feel property of ODT helps to change the perception of medication (Parkash et al., 2011).
- Increased bioavailability and faster onset of action: Oromucosal absorption leads to pre-gastric absorption, especially for formulations where the active ingredient dissolves rapidly.

Ideal properties of ODTs

An ideal ODT should maintain the following properties.

- Should be ionizable in oral cavity.
- Be dispersible and diffusible in mouth.
- The active material should be less than 50 mg in each tablet.
- Half-life of the active material should be short and suitable for frequently dosing.
- Should not have bad taste and smell.
- Should be dispersible in oral cavity without any need of water.
- Be robust to external conditions such as humidity and temperature.
- Conventional packaging processes can be applicable.
- Be able to manufacturing with using low cost equipment (Comoglu and Ozyilmaz, 2019).

Desired characteristics of ODTs

Because administration of ODTs is different from administration of conventional tablets, ODTs should maintain several unique properties (Sresta et al., 2017),

Fast Disintegration - ODTs should disintegrate in the mouth without additional water. The disintegrated tablet should become a soft paste or liquid suspension, which can provide good mouth feel and smooth swallowing.

Drug Properties - For the ideal ODT technology, the drug properties should not significantly affect the tablet property.

Taste of Active Ingredients - Taste masking is an essential requirement for ODTs for commercial success.

Tablet Strength and Porosity - Because ODTs are designed to have a quick dissolution time, excipients should have high wettability, and the tablet structure should also have a highly porous structure.

Moisture Sensitivity - ODTs should have low sensitivity to humidity. This problem can be especially challenging because many highly water-soluble excipients are used in formulation to enhance fast dissolving properties. A good package design should be created to protect ODTs.

Formulation processes of ODT

Manufacturing techniques of ODTs can be examined as non-patented and patented technologies such as Zydis[®], Flashtab[®], Durasolv[®].

Future research trends in ODTs

Although the ODT area has passed its infancy, as shown by a large number of commercial products on the market, there are still many aspects to improve in the ODT formulations. Despite advances in the ODT technologies, formulation of hydrophobic drugs is still a challenge, especially when the amount of drug is high. The future of ODTs also lies in the development of effective taste-masking properties. In general, the ODT formulations require large amounts of excipients, and having large doses of drug will only make the final formulation too big to handle. An ODT formulation that would require fewer excipients than the drug itself would be a breakthrough. While the problems to be solved are not easy, the history suggests that it is just a matter of time before they are solved (Fu et al., 2004).

Conclusion

ODTs have improved patient compliance, convenience, bioavailability and rapid onset of action. In future, ODTs may be the most acceptable and prescribed dosage form due to its rapid action. Their characteristic advantages such as administration without water, anywhere, anytime lead to their increased patient compliance in today's scenario of life. Considering many benefits of ODTs, a number of formulations are prepared in ODT form by most of the pharmaceutical companies.

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