Stamford Journal of Pharmaceutical Sciences

Orodispersible Tablets: A Short Review

Tasbira Jesmeen, Riaz Uddin*

Department of Pharmacy, Stamford University Bangladesh, 51, Siddeswari Road, Dhaka-1217, Bangladesh.

Short Review Article

INTRODUCTION

Oral route of drug administration is the most common and preferred method of delivery (Dhirendra *et al.,* 2009) as it is the simplest and easiest way of administering drugs (Vasconcelos *et al.,* 2007). The rout offers ease of drug administration in a convenient manner and patients are more familiar with this rout. So, patient compliance and thus drug treatment is typically more effective with orally given medications when compared with other routes of administration, for example, parenteral (Dhirendra *et al.,* 2009). There are strong evidences that oral administration produces equally good clinical results, has fewer complications, is less costly and causes less patient inconvenience (MacGregor and Graziani, 1997).

For any drug to exhibit its prompt pharmacologic action, its serum concentration has to reach optimum level within a short period of time (Uddin *et al.,* 2010). Tablets and hard gelatin capsules constitute major portion of drug delivery systems that are currently available. However, many patients groups, such as the elderly, children and patients who are mentally retarded, non-cooperative, nauseated or on reduced liquid intake/diets have difficulties swallowing these dosage forms. Those who are travelling or have little access to water are similarly affected (Mallet, 1996; Porter, 2001). To fulfill these medical needs, pharmaceutical technologists have developed a novel oral dosage form known as Orodispersible tablets (ODTs).

***Corresponding Author**
Riaz Uddin
Lecturer, Department of Pharmacy
Stamford University Bangladesh
51, Siddeswari Road
Dhaka-1217, Bangladesh
E-mail: kp_ruddin@yahoo.com
Contact No.: +880 1749995653

ODTs: RAPID DISINTEGRATING ORAL DOSAGE FORM

Orodispersible tablets are those tablets dispersing upon contact with the moist mucosal surfaces of the oral cavity and quickly release their components without mastication or water before swallowing (Ibrahim and El-Setouhy, 2010; European Pharmacopoeia, 2002; Pierre *et al.,* 1998). ODTs disintegrate rapidly in saliva, usually in a matter of second, without the need of taking water. Thus drug dissolution and absorption as well as onset of clinical effect can be obtained significantly quicker than that of conventional dosage forms (Bradoo *et al.,* 2001; Seager, 1998).

WHY DRUGS ARE FORMULATED AS ODTs

ODTs offer some great advantageous features over other conventional dosage forms, especially for patients of specific age groups and with disease conditions. Almost all patients encounter difficulties in taking tablets. But Difficulties with and resistance to tablet taking are common and particularly prevalent in geriatric, pediatric, and psychiatric patients (Gohel *et al.,* 2004). Thus ODTs help a proper peroral administration in pediatric and geriatric population where swallowing is a matter of trouble (Dey and Maiti, 2010).

Dysphagia is a pathologic difficulty with swallowing. This condition is common in older indi-

Table 1. Examples of some patented orodispersible tablets available in the market.

Patented Technology	Technology Based on	Technology developed by Company	Example (Brand name)
Zydis	Lyophilization	R.P.Scherer, Inc. Germany	Olanzapine (Zyprexa Zydis)
Quicksolv		Janssen Pharmaceutical Inc., USA	Cisapride monohydrate (Propulsid Quicksolv)
Lyoc		Farmalyoc France	Phloroglucinol Hydrate (Spasfon Lyoc)
Flashtab	Direct compression	Ethypharm France	Ibuprofen (Nurofen FlashTab)
Orasolv		Cima Labs, Inc. USA	Paracetamol (Tempra Quicklets)
Durasolv		Cima Labs, Inc. USA	Zolmitriptan (Zolmig ZMT)
Wowtab		Yamanouchi Pharma Tech. Inc. USA	Famotidine (Gaster D)
Ziplets		Eurand International Italy	Ibuprofen (Cibalgina DueFast)
Advatab	Microcaps and diffuscap CR Technology	Eurand International Italy	Cetrizine hydrochloride AdvaTab cetrizine
Flashdose	Cotton Candy Process	Fuisz Technology, Ltd. USA	Tramadol HCl (Relivia Flash dose)
Oraquick	Micromask taste masking	KV Pharm.Co., Inc. USA	Hyoscyamine Sulfate ODT

viduals, patients with neurodegenerative diseases, such as Parkinson's disease, stroke and cancer of the head and neck and some other physical disorders including hypertension and gastroesophageal reflux disease, which can cause scarring of the esophagus and individuals with depression and/or anxiety (Llorca, 2011). Physical problems with swallowing (dysphagia) can exacerbate compliance problems and undermine treatment efficacy (Ibrahim and El-Setouhy, 2010). ODTs offers removal of the need to swallow a pill or capsule, thereby reducing the effort and physiological stress associated with tablet swallowing. Difficulty in swallowing conventional tablets and capsules has emerged as an additional factor in medication noncompliance and has led to the development of alternative drug delivery strategies such as ODTs (Navarro, 2010).

ODTs require no water (Hirani *et al.*, 2009) and thus it is very convenient for those who are travelling in areas where there is a scarcity of water. Apart from these ODTs also offer easily measured dosing (Llorca, 2011) thus accuracy of dosage can be obtained (Ibrahim and El-Setouhy, 2010). The system gives rapid onset of action, and increase in bioavailability. The increased bioavailability of some orodispersible tablets compared to conventional tablets could be due to the dispersion in saliva and pregastric absorption. This pregastric absorption avoids first pass metabolism and can be a great advantage in drugs that undergo a great deal of hepatic metabolism (Habib *et al.*, 2000; Chang *et al.*, 2000).

RECENT TREND OF MANUFACTURING ODTs

The technologies used for preparation of orodispersible tablets include lyophilization, moulding, direct compression, cotton candy process, spray drying, sublimation and nanonization. These techniques are based on the principles of increasing porosity and/or addition of superdisintegrants and water soluble excipients in the tablets (Malik *et al.*, 2011a). There are

Table 2. Some example of recently prepared orodispersible tablets.

Drug	Method	Reference
Ofloxacin	Taste masked microspheres of ofloxacin were prepared using Eudragit and orodispersible tablets of the formulated microspheres were using natural superdisintegrant.	Malik *et al.*, 2011a
Nimesulide	Orodispersible tablets were prepared using locust bean gum as a natural superdisintegrant.	Malik *et al.*, 2011b
Cetirizine dihydrochloride	Tablets were prepared using cetirizine along with camphor and mannitol in different proportion.	Subramanian *et al.*, 2010
Pheniramine maleate	Effervescent method	Swamy *et al.*, 2009
Diazepam	ODTs were prepared using different types of superdisintegrants at different concentration using wet granulation and direct compression methods.	Abed *et al.*, 2010
Valsartan	Tablets were prepared by freeze-drying technique.	Ibrahim and El-Setouhy, 2010
Ondansetron HCl	Direct compression method.	Goel *et al.*, 2009
Roxithromycin	ODTs were prepared using modified polysaccharides as rapidly disintegrating excipients.	Sharma *et al.*, 2008
Indomethacin	The tablets were made by non-aqueous wet granulation technique with superdisintegrant incorporated both intragranularly and extragranularly.	Singh *et al.*, 2008

some patented technologies for the manufacture of ODTs (Table 1). Table 2 represents examples of some recently prepared orodispersible tablets.

CONCLUSION

ODTs may disintegrate in moist condition and thus there is always a probability of deterioration of the prepared tablets. So packaging of the formulations should be considered with highest care. Moreover drugs those require sustained release are not good candidate to be formulated as ODTs. These disadvantages may limit the preparation of ODTs in some cases.

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