



IJPPR

INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals

ISSN 2349-7203



Human Journals

Review Article

March 2020 Vol.:17, Issue:4

© All rights are reserved by Samadhan Mali et al.

Effervescent Floating Drug Delivery System: A Review



Samadhan Mali*, S.Talele, A.Jadhav

*Sandip Institute of pharmaceutical science, Nashik;
Maharashtra*

Submission: 22 February 2020

Accepted: 29 February 2020

Published: 30 March 2020



HUMAN JOURNALS

www.ijppr.humanjournals.com

Keywords: Effervescent Floating Tablet, Roller Compaction, FDSS

ABSTRACT

Oral sustained release gastro-retentive dosage forms offer many advantages for drugs with the absorption from upper parts of the gastrointestinal tract. Gastric emptying is a complex process and it is highly variable. The floating drug delivery systems are useful methods to avoid this variability which increases the retention time of the drug delivery systems for more than 12 hours. These systems are useful for many of the problem occurred during development of pharmaceutical dosage form. The objective of the review is to understand the current approaches of this drug delivery system.

INTRODUCTION

Floating systems or dynamically controlled systems are low density systems that have sufficiently buoyancy to flow over the gastric contents and remain buoyant in the stomach without affecting the gastric emptying rate for a prolonged period of time. This result is an increased gastric retention time and a better control of the fluctuations in plasma drug concentration. Oral controlled release dosage forms have been developed over the past three decades. Drug absorption from the gastrointestinal tract is a complex procedure and is subject to many variables. Gastroretentive systems can remain in the gastric region for several hours and hence significantly prolong the gastric residence time of drugs. The drug is released slowly as desired rate from the system and after released of drug the residual system is emptied from the stomach. e.g. Chitosan and effervescent components such as sodium bicarbonate and citric or tartaric acid or matrices containing chambers of liquid that gasify at body temperature.

CLASSIFICATION:

1. Effervescent floating tablet:

These are the matrix type preparations in which swellable polymers are used when they come in contact with gastric juice in the stomach, Carbon dioxide is liberated and is trapped in the swollen hydrocolloids. This provides buoyancy to the dosage form.

A) Gas generating system: in these type the CO_2 containing agents are coupled with matrix tablet.

B) Volatile liquid: These systems can be made to float in the stomach because of floatation chamber, which may be a vacuum or filled with air or a harmless gas, while drug reservoir is encapsulated inside a microporous compartment.

2. Non-effervescent floating tablet:

Based on mechanism that it adher to mucous layer of GI tract. The most commonly used excipients in noneffervescent FDDS are gel forming or highly swellable cellulose type hydrocolloids, polysaccharides and matrix forming material such as polycarbonate, polyacrylate, polymethacrylate, polystyrene as well as bio-adhesive polymer such as chitosan and carbopol.

MECHANISM:

Mechanism of Floating Effervescent Tablets:

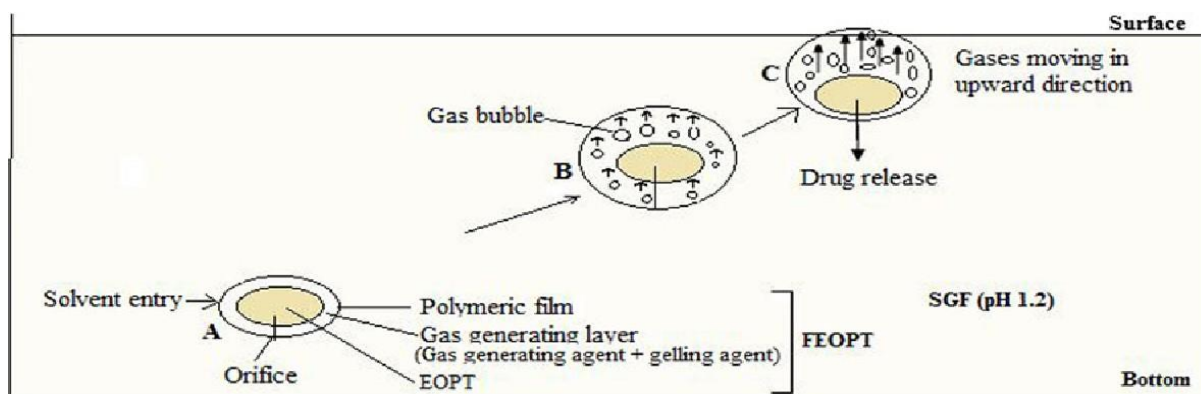


Fig. 7. Schematic representation of mechanism of floatation and drug release: A floating elementary osmotic pump tablet

After administration of effervescent floating dosage form coming in contact with the gastric fluid the dosage form get swells up and the slowly release of the drug without disintegration of the tablet takes place. When the tablet comes in the contact of gastric fluid, it produces effervescence by releasing CO₂ gas. When the fluid penetrates into the tablet, tablet starts to float.

ADVANTAGES

Floating dosage forms such as tablets or capsules will remains in the solution for prolonged time even at the alkaline pH of the intestine.

- Have advantage for drugs having local action
- Advantageous in case of diarrhea.
- Enhancement of bioavailability.
- High variability in gastric emptying.

DISADVANTAGE:

- Not suitable for dosage form having stability and solubility difficulty.
- Patients should not be dosed with floating forms just before going to bed.
- They require a sufficiently high level of fluids in the stomach so that the drug dosages form float therein and work efficiently.

- High variability in gastric emptying.

METHODS OF PREPARATIONS: WET GRANULATIONS:

- Mixing of drugs and excipient.
- Preparation of binder solution.
- Mixing of binder solution with drug mixture and form wet mass.
- Drying.

DRY GRANULATION:

In dry granulation process, the powder mixture is compressed without the use of heat and solvent. It is the least desirable of all methods of granulation. The two basic procedures are to form a compact of material by compression and then to mill the compact to obtain a granules. Two methods are used for dry granulation. The more widely used method is slugging, where the powder is recompressed and the resulting tablet or slug are milled to yield the granules. The other method is to recompress the powder with pressure rolls using a machine such as Chilsonator.

ROLLER COMPACTION:

The compaction of powder by means of pressure roll can also be accomplished by a machine called chilsonator. Unlike tablet machine, the chilsonator turns out a compacted mass in a steady continuous flow. The powder is fed down between the rollers from the hopper which contains a spiral auger to feed the powder into the compaction zone. Like slugs, the aggregates are screened or milled for production into granules.

APPLICATION

1. Enhanced Bioavailability
2. Reduced fluctuation of drug concentration.
3. Site-Specific Drug Delivery.
4. Sustained Drug Delivery.
5. Minimized adverse activity at the colon.

CONCLUSION

Drug absorption in the gastrointestinal tract is a highly variable procedure and prolonging gastric retention of the dosage form extends the time for drug absorption. FDDS promises to be a potential approach for gastric retention. Although there are number of difficulties to be worked out to achieve prolonged gastric retention, a large number of companies are focusing toward commercializing this technique.

REFERENCES

1. Patil S.G, Siddaiah, Formulation and evaluation of effervescent tablet: a review, Journal of drug delivery and therapeutics, 2008;8(6):296-303.
2. Bhardwaj. V, Nirmala, Harikumar S.L, Floating drug delivery system: a review, Pharmacophore, 2013, vol 4 (1), 26-38.
3. Arunachalam. A, Karthikeyan. M, Konam. K, Pottabathula. HP, Sethuraman. S, Ashutosh Kumar. S, Manidipa. S, Floating drug delivery: a review, AAPS Pharmascitech. Feb 2005.
4. Gupta.P, Kothiyal.P, Floating drug delivery system: a review, International journal of pharma research and review, August 2015;4(8); page no.37-44
5. Kataria.S, Middha A Bhardwaj S, Floating drug delivery system: a review, International research journal of pharmacy, 2011,2(9); page no.18-24.
6. Tripathi.P, Khar.RP, Vishwavibhuti, floating drug delivery system; a review, International journal of research and development in pharmacy and life science, March-April 2012, page no.1-10.
7. Jain A, Hatila.K, Umashankar, Floating drug delivery system: a review, International Journal of pharmaceutical studies and research, July-sept 2011, page no 01-06.
8. Panda.P, Vishwakarma D.K, Verma.N.K, a brief review on bilayer tablet, International journal of advances in pharmaceutics, 2017;06(03):70-78.

<i>Image Author -1</i>	Author Name – Samadhan Mali <i>Author Affiliation;-Mpharm student</i> <i>Sandip Institute of pharmaceutical science ,Nasik</i>
<i>Image Author -2</i>	Author Name - Dr.Swati Talele <i>Author Affiliation:-Vice principal(Guide)</i> <i>Sandip Institute of pharmaceutical science ,Nasik</i>
<i>Image Author -3</i>	Author Name-Dr.Anil Jadhav <i>Author Affiliation:-Principal</i> <i>Sandip Institute of pharmaceutical science ,Nasik</i>