Biological Approaches To The Controlled Delivery Of Drugs

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REVIEW ARTICLE

Gastroretentive Dosage Forms: An Approach to Oral Controlled Drug Delivery Systems

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ABSTRACT

Gastric retentive dosage forms have been developed to provide controlled release therapy for drugs with reduced absorption in the lower gastrointestinal (GI) tract or for local treatment of diseases of the upper GI tract. Gastric retentive dosage forms depends on natural GI physiology such as floating or large tablets that depend on delayed emptying from the fed stomach or the dosage forms that are designed to fight the physiology and avoid emptying in the fasted state through dosage forms of even larger sizes with or without flotation or bioadhesion. Floating systems have been considered as one of the important categories of drug delivery systems with gastric retentive behavior. Floating matrix tablets have been developed to prolong gastric residence time leading to an increase in drug bioavailability. The review article explains the various floating drug delivery systems that are formulated in order to enhance the drug bioavailability. Moreover, the identification of key factors influencing the variability of gastric retention has been discussed.

Key Words: Gastroretentative, Drug delivery system, Floating systems

INTRODUCTION

The oral route is considered as the most promising route of drug delivery. Effective oral drug delivery process depends upon the factors such as gastric emptying process, gastrointestinal transit time of dosage form, drug release from the dosage form and site of absorption of drugs [1-2]. Most of the oral dosage forms possess several physiological limitations such as variable gastrointestinal transit because of variable gastric emptying leading to non-uniform absorption profiles, incomplete drug release and shorter residence time of the dosage form in the stomach. This leads to incomplete absorption of drugs having absorption window especially in the upper part of the small intestine, as once the drug passes down the absorption site, the remaining quantity goes unabsorbed. The gastric emptying of dosage forms in humans is affected by several factors because of which wide inter- and intra-subject variations are observed [3-4]. Since many drugs are well absorbed in the upper part of the gastrointestinal tract, such high variability may lead to non-uniform absorption and makes the bioavailability unpredictable. Hence, a beneficial delivery system to control and prolong the gastric emptying time and can deliver drugs in higher concentrations to the absorption site to show local action in the stomach requires a specialized delivery system. A significant approach for showing local action and for the treatment of gastric disorders can be achieved by floating drug delivery systems (FDDS) [5-6]. A number of FDDS involving various technologies have been developed such as single and multiple unit hydro dynamically balanced systems (HBS), single and multiple unit gas generating systems, hollow microspheres and raft forming systems [7-8]. The present review article summarizes various approaches towards prolonging the gastric emptying time and delivering drugs in higher concentrations to the absorption site in order to show enhanced duration of action of the dosage form. Moreover, many FDDS developed that are found to increase the bioavailability of the dosage forms have been delineated.

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microneedle .. as the number of new drugs of biological origin continues to increase. . delivering electronically controlled doses of medication which result in improved consistency of.Biological approaches to the controlled delivery of drugs. By New York Academy of Sciences. About this book Shop for Books on Google Play. Browse the.Effective drug delivery systems can be developed by overcoming formulation barriers and/or biological barriers. The engineering approach has a limit in solving.Nanoparticles are an attractive approach for the delivery of a variety of Drugs incorporated into PNPs are protected from the biological.