FACTORS WHICH AFFECT THE DEVELOPMENT OF THE FLOATING TABLETS TECHNOLOGY

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Oral delivery of drugs such as tablets is the most preferable route of drug delivery due to the ease of administration. Oral sustained-release technology provides oral delivery for 24 h; however, in substances that cannot be well absorbed throughout the whole gastrointestinal tract, it may be disadvantageous.

Normal gastric residence times usually range between 5 min and 2 h. Gastric emptying is unpredictable in the presence of food and disease conditions, though drugs with a short half-life are eliminated quickly from the stomach. This has led to the development of oral gastro-retentive dosage forms.

Various gastroretentive techniques are used, including floating, swelling, high density, and bioadhesive system, have been explored to increase the gastroretention of dosage forms. Floating systems having low density systems that have sufficient buoyancy to float over the gastric contents and remain in the stomach for a prolonged period.

Hydrophilic polymers hydroxylpropylmethyl cellulose (HPMC) were found to be more beneficial to improving floating properties. Hydrophilic polymer slowly forms thick gel, which retains integrity of the formulation and promotes drug release through thick gel which controls the burst release. This polymer produces gel-forming matrices and, in contact with gastric fluid, possess sufficient structure to form a gel layer and achieve an overall specific gravity lower than that of gastric fluid.

The main purpose of a floating drug delivery system is to increase the gastric residence time of the dosage form by generating gas. Citric acid and sodium bicarbonate were found as effervescent base to generate the carbon dioxide and to enhance the buoyancy of the tablets.

Floating tablets may be prepared by direct compression or by wet granulation. In the second case it is necessary to use an alcohol solution instead of the aqueous binder to prevent interaction between citric acid and sodium bicarbonate.

The in vitro buoyancy of prepared tablets should be determined by floating lag time and total floating time. The time required for the tablets to rise to the surface and float is determined as floating lag time. The duration of time the dosage form constantly remained on the surface is determined as the total floating time.