Preparation and Evaluation of Novel Metronidazole Floating and Sustained release Matrix Tablet

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Abstract:
Metronidazole is a nitroimidazolin antibiotic that in combination with other drugs is used for treatment of Helicobacter pylori. Making a floating system of this drug may increase the residence time of the device in the stomach causing more encountering of drug with mentioned bacteria, then the drug may be more effective against it. Designing such a device can result reduced dose, hence brings better compliance in patients. In this study we aimed to develop a floatable and sustained release device of metronidazole. Various formulation were designed using multi-factorial design. HPMC, psyllium and carbapol in different concentrations were used as floating agents. As a gas forming agent, sodium bicarbonate was utilized in the formulations. In other formulations of this study, calcium silicate was used as a porous agent, prepared tablets were investigated from the view points of hardness, friability and floating properties (time for starting and duration of floating). Floating and release profiles were studied using USP apparatus II in HCl 0.1 N medium. Calcium carbonate based formulations that contain HPMC as filler showed prolonged lag time in comparison with the calcium carbonate based tablets. Selected formulations were able to float immediately after contacting with gastric fluids and remained floated for at least 8 hours. Sustained release profile of the drug was obtained, made it possible to consume twice daily for more compliance. Prepared tablets also guaranteed more localized drug concentration because of more residence time of the drug in GI that could be more useful for H. pylori eradication.

Keyword: Metronidazole, Helicobacter pylori, Retardation properties, Sustained release