

Development and Evaluation of Gastro Retentive Tablet for Anticonvulsant Drugs

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Abstract: Background: The present study aimed to formulate and evaluate floating gastroretentive tablets containing Gabapentin and Nortriptyline to achieve prolonged gastric residence and sustained drug release. **Methods:** Floating tablets were prepared by the direct compression method using hydrophilic polymers such as HPMC K4M and Carbopol 934P along with sodium bicarbonate and citric acid as gas-generating agents. Preformulation parameters including bulk density, tapped density, compressibility index, Hausner's ratio, and angle of repose were evaluated to determine flow properties of the powder blend. The compressed tablets were characterized for weight variation, hardness, friability, buoyancy lag time, total floating time, swelling index, and in-vitro drug release. **Results:** Preformulation studies demonstrated satisfactory flow properties with compressibility index values ranging from 16.00–18.33% and Hausner's ratio between 1.19–1.22. The prepared tablets showed acceptable hardness (4.8–6.1 kg/cm²) and low friability (<1%), indicating good mechanical strength. Floating lag time ranged from 44–82 seconds, while total floating duration extended up to 14.2 hours, confirming effective buoyancy. Swelling studies revealed progressive polymer hydration with swelling indices reaching up to 134.7% after 6 hours. Dissolution studies demonstrated sustained drug release for 12 hours, with the optimized formulation achieving nearly complete drug release. **Conclusion:** The developed floating gastroretentive tablets demonstrated satisfactory physicochemical properties, prolonged buoyancy, and controlled drug release behavior. The optimized formulation exhibited promising potential for enhancing gastric retention and improving therapeutic efficacy of the drugs.

Keywords: Floating tablets; Gastroretentive drug delivery system; Gabapentin; Nortriptyline; Swelling index; In-vitro buoyancy; Sustained drug release; Direct compression.

