Abstract

Semaglutide is a GLP-1 receptor agonist that is commonly used in type 2 diabetes mellitus management. However, its injectable formulation introduces challenges in patient acceptability and compliance. Oral semaglutide formulations have been produced, but currently, they present challenges in terms of limited bioavailability (around 1%). This study aims to formulate and evaluate an oral delivery system for semaglutide using sodium caprate (C10) as a permeation enhancer. Six formulations were developed with varying C10 concentrations. Formulations F4, F5, and F6 failed physicochemical screening due to insufficient hardness and excessive friability, while F1, F2, and F3 met acceptance criteria and proceeded to release testing. The release study was assessed using UV-Vis spectrophotometry at 215 nm. F3, containing the highest C10 concentration, achieved complete apparent drug release at 120 minutes, compared to approximately 73.27% for F2 and a progressive decline in F1. The enhanced release in C10-containing formulations is attributed to C10's amphiphilic nature, reducing interfacial surface tension and improving semaglutide wettability in the medium. These findings support F3 as the most promising formulation. Future work should prioritize validated HPLC quantification, further excipient optimization, and in vivo bioavailability studies to fully establish the therapeutic potential of this approach.

Keywords: Diabetes Mellitus Type-2, Sodium Caprate, Permeation Enhancer