

DESIGN AND DEVELOPMENT OF GASTRO-RETENTIVE FLOATING TABLET CASE USING FDM 3D PRINTING TECHNOLOGY

Parul Vaishnav^{a*}, Kuldeep Vinchurkar^b and Dinesh K. Mishra^c

(Received 26 January 2024) (Accepted 17 June 2024)

ABSTRACT

The aim of this research was to examine a novel Fused Deposition Model (FDM) 3D Printing Method for creating a gastro-retentive floating tablet case containing metronidazole compressed tablet. Metronidazole was employed as a model drug and successfully integrated into floating tablet case composed of polyvinyl alcohol filament. The tablet design was made by AutoCAD software and the slicing of tablet design was carried out. To evaluate the formulation parameters for 3D printed tablet case, various orifice sizes were optimized. These 3D printed tablet cases were assessed for weight variation, friability, hardness, *in vitro* floating test and *in vitro* dissolution studies. All results met acceptable criteria. Notably, the 0.5 mm orifice case floated on 0.1 N HCl media surface for over 345 min, displaying zero - order drug release. Thus, this work demonstrates the potential of 3D Printing technology as an innovative platform for gastroretentive floating tablets to promote a modern era of personalized medicine.