Abstract

Introduction: Repaglinide (RPG) is an antidiabetic drug administered before meals to lower fasting glucose levels by stimulating insulin secretion from pancreatic beta cells and has a short half-life of about 60 minutes. Therefore, long-term treatment with this drug requires frequent administration before meals, which leads to patient intolerance. Due to the mentioned limitations, many efforts have been made to develop sustained and controlled release formulations of RPG. The aim of this research is to investigate the drug release pattern in different acidic and alkaline environments in the digestive tract and the rate of repaglinide absorption change after loading it in solid lipid nanoparticles (SLN) coated with chitosan, in intestinal models isolated from animals in The environment is outside the body.

Methodology: After making SLN nanoparticles, the amount of drug release was measured by dialysis bag method in acidic and alkaline medium, and the amount of released repaglinide drug concentration was measured by spectrophotometry (ultraviolet-visible spectroscopy). Also, in vitro release experiments from rat and sheep intestines were performed to check the amount of drug absorption in the animal intestine from chitosan-coated SLN nanoparticles compared to the pure drug solution.

Results and conclusion: The results of the repaglinide release test in acidic and alkaline environment showed that the maximum absorption rate of SLN structures with chitosan coating is higher than the pure drug. SLN containing chitosan is more than the plain oral drug and this difference was statistically significant in the intestine of sheep. These results indicate that the release of repaglinide from chitosan-coated nanoparticles is more controlled than the oral drug, so that the release of the drug in this Nanoparticles remain in the plateau for a longer time and the maximum drug release rate is higher in chitosan-coated nanoparticles.

Keywords: Nanostructured lipid carriers (SLN), Repaglinide, chitosan, diabetes type 2, oral antidiabetic drugs