1. Introduction

1.1. Oral drug delivery

1.1.1. Oral rout of administration

Oral drug delivery has been known for decades as the most widely utilized route of administration among all the routs that have been employed for the systemic delivery of drug via various pharmaceutical products of different dosage forms. Oral rout has by far received the most attention with respect to research on physiological and drug constraints as well as design and testing of products, also oral rout is perhaps the most preferred to the patient and the clinician alike (Shojaei, 1998). However, oral drug delivery is defined as the method of swallowing a pharmaceutical compound with the intention of releasing it into the GIT of humans and animals (Ghosh & Pfister, 2005; Chugh et al., 2012).

1.1.2. Pharmacokinetics of oral drugs

For any given drug and dose, the plasma concentration of the drug will rise and fall according to the rates of three processes: absorption, distribution, and elimination.

Absorption of a drug refers to the passage of drug molecules from the site of administration into the circulation, with the rate dependent on the physical characteristics of the drug and its formulation (Evans et al., 1992). Drug delivery by oral route may result in only partial absorption and, thus, lower bioavailability, the oral route requires that a drug dissolves in the gastrointestinal fluid and then penetrates the epithelial cells of the intestinal mucosa. Most drugs are absorbed by