ABSTRACT: Rapid developments in the field of molecular biology and gene technology resulted in generation of many macromolecular drugs including peptides, proteins, polysaccharides and nucleic acids possessing superior pharmacological efficacy with site specificity and less toxic effects. However, therapeutic potential of these compounds lies in our ability to design and achieve effective and stable delivery systems. The main hurdle to the use of these hydrophilic macromolecular drugs as potential therapeutic agents is their inadequate and erratic oral absorption because of instability in the acidic environment of the stomach (Sudhakar et al., 2006). The pharmaceutical scientists now have to consider new strategies to effectively deliver these hydrophilic molecules; the oral mucosa (Buccal and Sublingual delivery) provides one potential route for achieving this (Shojaei, 1998).

KEYWORDS: Molecular biology; pre systemic metabolism; buccal delivery; penetration enhancer; bile salts; chitosan

Introduction

The rapid developments in the field of molecular biology and gene technology resulted in generation of many macromolecular drugs including peptides, proteins, polysaccharides and nucleic acids in great number possessing superior pharmacological efficacy with site specificity and less toxic effects. However, therapeutic potential of these compounds lies in our ability to design and achieve effective and stable delivery systems. The main hurdle to the use of these hydrophilic macromolecular drugs as potential therapeutic agents is their inadequate and erratic oral absorption because of instability in the acidic environment of the stomach (Sudhakar et al., 2006). The pharmaceutical scientists now have to consider new strategies to effectively deliver these hydrophilic molecules; the oral mucosa (Buccal and Sublingual delivery) provides one potential route for achieving this (Shojaei, 1998).

The administration of drugs by the buccal route has several main advantages over peroral administration, including the following:

1. The drug is not subjected to the destructive acidic environment of the stomach.
2. Therapeutic serum concentrations of the drug can be achieved more rapidly.
3. The drug enters the general circulation without first passing through the liver.
4. The mucosa lining the oral cavity is easily accessible, which ensures that a dosage form can be applied to the required site and removed easily in the case of an emergency.

Two sites within the buccal cavity have been used for drug administration, Buccal and Sublingual. The buccal delivery allows prolonged localized therapy and enhanced systemic delivery whereas the sublingual route is usually used when a rapid onset of action is required (Kurosaki et al., 2002). However, like the skin, the buccal mucosa