PREFACE

Since Dr. Tsuneji Nagai of Hoshi University, Japan used the concept of bioadhesion in the early 1980’s for the delivery of insulin across the nasal mucosa in beagle dogs; several researchers tried a large number of drugs for administration through Nasal mucoadhesive dosage forms. The potential of these dosage forms have been found to be tremendous because of their ability to improve the bioavailability of many such drugs by bypassing the hepatic first pass metabolism. Because of the growing number of newer molecules in the form of peptides and proteins, the research in this field has gained the centre stage for the non-invasive drug delivery as an alternative to parenteral route.

Carvedilol (C_{24}H_{26}N_{2}O_{4}), the β-adrenergic blocking agent with α1-blocking activity is indicated in the treatment of mild to moderate congestive heart failure (CHF) and is used for treating high blood pressure. Carvedilol can reduce the risk of a second heart attack by 40% and increase survival among patients with congestive heart failure. For high blood pressure and congestive heart failure, the dose may range from 3.25mg twice daily to a maximum of 25mg twice daily. Poor oral bioavailability (25-35%), low molecular weight (406.5 g/mol), low dose (3.25 mg), lipophilic log PC value (3.967) with the elimination half-life of 7 to 10 hours makes it suitable for nasal delivery.
In the earlier approaches for the delivery of Carvedilol, conventional matrix gels, films, patches, discs, microspheres, bilayered systems, ointments and hydrogel systems based on the principle of bioadhesion were developed. Many pre-clinical and clinical studies on various formulations through nasal route have demonstrated that efficacy can be achieved systemically. However, these suffer from some serious drawbacks such as slow onset of action, histological damage to nasal mucosa, or lack of retentivity at the applied site. However, limited studies exist on novel devices that are superior to those of conventional nasal adhesive systems for the delivery of therapeutic agents through nasal mucosa.

The principal aim of present work was to develop retentive sustained release nasal Carvedilol gels that avoid hepatic first pass metabolism using mucoadhesive agents from natural edible sources. The study mainly focuses on the preparation of the gels with the best possible combinations of polymers and evaluation of in vitro, ex vivo and in vivo parameters. Previous work concentrated on synthetic mucoadhesive materials that may not be biocompatible and completely biodegradable. Since the mucoadhesive agents have been extracted from edible sources they are inherently biocompatible and biodegradable in nature. These substances may be superior substitutes of synthetic polymers.

The thesis entitled “Formulation and Evaluation of Nasal Mucoadhesive Gels” has been divided into eight chapters. Chapter1
gives brief introduction to all the materials and formulation aspects, Chapter 2 describes the Literature survey. Chapter 3 describes the theoretical analysis. Chapter 4 describes the experimental investigations. Chapter 5 envisages the results and Chapter 6 describes its discussion. Chapter 7 briefly gives summary and conclusion and recommendations for future scope of work. Chapter 8 gives list of references and index of contents.