

Study of Secnidazole-Serratiopeptidase Alginate/HPMC Gels For Periodontal Delivery

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Abstract: The main goal of this study was to develop a controlled release periodontal formulation of Secnidazole Serratiopeptidase that can be used in the treatment of periodontitis by direct intrapocket administration, thus ensuring a high effective concentration of antimicrobial agent at the site of infection. This minimizes the occurrence of systemic side effects and bacterial resistance. Serratiopeptidase, a proteolytic enzyme with anti-inflammatory activity, is widely used in dental treatment. The topical use of enzymes is also associated with a significant increase in the concentration of antibiotic at the wound and decrease in the rate of infection. Therefore, localized delivery of the enzyme along with antibiotic may provide better relief than antibiotic alone. The pH sensitive and mucoadhesive formulations consist of non-toxic polymer, Sodium alginate (1%), HPMC E50Lv (1-8%w/w). To modulate the gel strength and the bioadhesive force of gel HPMC E50Lv was used as viscosity enhancer. Viscosity studies indicated pseudo plastic (shear thinning) behavior of gel. Increase in polymer concentration showed increase in the viscosity thereby affecting the drug release. Dissolution studies demonstrate diffusion release of drug and enzyme from the gel thus alginate/HPMC gels can be used as an in-situ gelling vehicle to enhance periodontal drug delivery.

Keywords: Periodontal Drug Delivery, Secnidazole, Serratiopeptidase, Alginate, HPMC.

INTRODUCTION

Recent report on burden of diseases in India and a multicentric oral health survey [1] have revealed the prevalence of dental caries to be around 40-45% , and periodontal diseases in more than 90% of the Indian population, malocclusion in 30% of children, endemic fluorosis in 17 out of 32 states affecting 66 million and oral cancer in 12.6/100,000 population.

Periodontal diseases is a general term which encompasses several pathological conditions affecting the tooth supporting structures. Periodontal diseases include conditions such as chronic periodontitis,

aggressive periodontitis, systemic disease associated periodontitis and necrotizing periodontitis[2]

These conditions are characterized by a destruction of the periodontal ligament, a resorption of the alveolar bone and the migration of the junctional epithelium along the tooth surface. The clinical signs of periodontitis are changes in the morphology of gingival tissues, bleeding upon probing as well as periodontal pocket formation. This pocket provides an ideal environment for the growth and proliferation of anaerobic pathogenic bacteria [3]

The microorganisms colonizing the subgingival area represent the principal etiological factor in the development of the inflammation and