

**LOCAL DELIVERY OF CAFFIENE-LOADED CHITOSAN
NANOPARTICLES CONTAINING ETHYL CELLULOSE FILM FOR
THE ENHANCED TREATMENT OF PERIODONTITIS.**

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Abstract

Periodontal disease is a severe gum infection that damages the soft tissues and destroy the bone and supports your teeth. Periodontal Disease is very common and, is widely severe as the second most common disease worldwide. In the united states has a prevalence of 30-50% of the population, but about have severe form. This severe form is known as periodontitis. Caffeine shows antimicrobial and potent antioxidant activity and used to treat certain bacterial infection. Common side effect of caffeine includes Nausea, vomiting, hypertension, Rapid heartbeat and digestive issue. Nanoparticles loaded film contain chitosan and caffeine, Caffeine has a longer half-life 5-6 hours, Nanoparticles loaded film is much efficient to deliver small amount of Drug over prolonged period there by increasing patient compliance. Chitosan containing nanoparticles prepared by ionic gelation method. The Optimized batch of nanoparticles was evaluated for particle size, Zeta potential, Drug content, In-vitro Drug release study, antimicrobial study, and Transmission electron microscopy. Drug content and Drug release of optimized batch F3 were 86.40% and 89.30% respectively. Transmission electron microscopy (TEM) study shows that the particles size and Particle shape, after preparation of Nanoparticles they have loaded in film. Nanoparticles loaded film was prepared by solvent casting method using ethyl cellulose as polymer. The film was evaluated for thickness, weight uniformity, swelling index, folding

endurance, surface pH, and surface morphology study with Gas chromatography, antibacterial study. Drug content and folding endurance of optimized batch were 81.22% and 312 respectively. Chitosan containing ethyl cellulose loaded film combination is the improved carrier including other preparation of caffeine periodontal film for prolonged the drug action up 7 days.

Keywords: Caffeine and chitosan nanoparticles, nanoparticles loaded film, Plasticizer, Ethyl cellulose, local delivery.