

TITLE: ANTIFUNGAL EFFICACY OF KETOCONAZOLE-PLA-NANOPARTICLE AGAINST PLANKTONIC AND BIOFILM *CANDIDA* SPP

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Abstract

Candida species are harmless saprophyte yeasts, a normal component of the human biota and considered opportunistic, capable of causing infections of skin, mucous membranes, nails, and internal infections. Polymeric nanoparticles as drug carriers are a suitable system for antimicrobial drug delivery. They can be active at low concentrations against a variety of infectious agents and kill microorganisms by releasing antimicrobial agents or by contact-killing cationic surfaces. In this study, PLA nanoparticles containing ketoconazole were prepared by the nanoprecipitation method with dropping technique. Characterization of nanoparticles was assessed by dynamic light scattering, transmission electron microscopy and quantification of loaded ketoconazole. Antifungal susceptibility tests were carried out against ATCC strains *Candida albicans*, *Candida dubliniensis*, *Candida krusei*, *Candida parapsilosis* and *Candida tropicalis*. Nanoparticles with a diameter of 188.5 nm, encapsulation efficiency of 45% and with sustained release of ketoconazole were obtained. Antifungal effects against all tested fungi strains were better than free ketoconazole, all MIC values were reduced at least 2-fold. Inhibition of yeast biofilms occurred mainly in biofilm formation and at less extent against pre-formed biofilms. Thus ketoconazole-PLA nanoparticles were prepared by a simple technique and with suitable characteristics, which could make them helpful in the treatment of *Candida* infections.

Keywords: *Candida* spp, biofilm, ketoconazole, nanoparticle.

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