

Cytotoxicity effect of curcumin nanoparticles on fluconazol resistant strains of Candida albicans and evaluation of CDR1 gene expression

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Introduction: Candida albicans is known as one of the important human fungal pathogens. Restrictions in treatment of fungal diseases such as side-effects of drugs and drug resistance have led researchers to new drugs, especially herbal medicines. curcumin as an herbal drug has anti-inflammatory and anti-cancer properties that nowadays researchers survey its antimicrobial function. Aim of the study was to investigate the anti-fungal potential of curcumin, against clinical isolates of Candida albicans in combination with fluconazol. **Materials and methods:** herein, we isolated 23 clinical strains of Candida albicans patients in Guilan province. After determination of antibiogram by disc diffusion and MIC methods, 20 fluconazol resistant isolates were treated by fluconazole only and in the combination with curcumin nanoparticles. Antimicrobial activity of nano-curcumin was assessed by MFC method. After RNA extraction and cDNA synthesis, CDR1 expression investigated in treated and untreated cells by curcumin nanoparticles and fluconazole. **Results:** 86.9% of isolates were resistant to fluconazole and the highest resistance for fluconazole was determined in 2048 µg/ml. Also Q-RT-PCR analysis revealed that curcumin nanoparticles in combine with fluconazole led to downregulation of CDR1, subsequently increase of fluconazole efficiency in resistance isolates. **Discussion:** our results suggested that curcumin nanoparticles could be inhibits fungal growth through different mechanism such as CDR1 downregulation in combination with lower dose of fluconazol (1/2 MIC).

Keywords : fluconazol, CDR1, Candida albicans, curcumin nanoparticles, MIC.

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