

Cytotoxicity effect of curcumin nanoparticles on Candida albicans fluconazol resistant strains and evaluation of CDR2 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, CDR2 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 CDR2, 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 CDR2 downregulation in combination with lower dose of fluconazol (1/2 MIC).

Keywords : fluconazol, CDR2, Candida albicans , curcumin nanoparticles, MIC.

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