

عنوان مقاله:

Vitamin D₃: A Promising Antifungal and Antibiofilm Agent Against Candida Species

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خلاصه مقاله:

Background and Purpose: Candida species are opportunistic fungal pathogens that cause mild to life threatening infections in both immunocompetent and immunocompromised populations. The increasing prevalence of drug-resistant Candida species has posed a significant challenge to the management of infections in clinical settings. Therefore, this study aimed to investigate the direct antifungal and antibiofilm effect of vitamin D₃ against Candida species. **Materials and Methods:** The antifungal activity of vitamin D₃ was evaluated by broth microdilution method based on the Clinical and Laboratory Standard Institute. Prevention of biofilm formation by Candida albicans was measured using the XTT assay following exposure to different concentrations of vitamin D₃. Moreover, expression of Agglutinin-like sequence gene 1 (ALS1), hyphal wall protein gene (HWP1), secreted aspartyl proteinase 6 gene (SAP6), and morphogenesis pathway regulatory gene (EFG1) were analyzed by real-time polymerase chain reaction using the comparative Ct method ($\Delta\Delta$ Ct) after exposure to vitamin D₃. **Results:** Vitamin D₃ showed antifungal activity against Candida species ranging from 1-128 μ g/mL. Furthermore, vitamin D₃ inhibited biofilm formation in a dose-dependent manner, with IC₅₀ of 7.5 μ g/mL. Treatment with vitamin D₃ resulted in significant upregulation of the EFG1, ALS1, and SAP6 genes under hypha-inducing conditions to overcome environmental challenges. **Conclusion:** Results of the current study demonstrated that vitamin D₃ has a significant inhibitory effect on Candida growth and biofilm formation. Considering its demonstrated antifungal and antibiofilm properties, vitamin D₃ holds promise as a potential agent for .medical applications

کلمات کلیدی:

Antifungal agent, Biofilm, Candidiasis, candida albicans, Vitamin D₃

