IN VITRO SYNERGISM BETWEEN TUNCAMYCIN AND AMPHOTERICIN B AGAINST PLANKTONIC AND BIOFILM Candida SPP

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Biofilms formed by Candida spp. are resistant towards most of the current antifungal drugs. Several types of drugs used in clinical practice were screened in vitro for their potentiation of the antifungal effect on Candida spp. Combination of antifungal drugs from different classes and mode of action are being studied in order to determine a better strategy in combating antifungal resistance. In this study, we investigated the antifungal activity of tunicamycin (TM) and amphotericin B (AmB) alone and in combination against oral planktonic and biofilm Candida spp. The MIC90 of tunicamycin (TM) and amphotericin B (AmB) alone against C. albicans, C. parapsilosis, C. glabrata and C. tropicalis ranged from 15.6 to 31.25 µg/ml and 7.8 to 31.25 µg/ml respectively. Synergism between TM and AmB was observed in the disc diffusion assay as well as in suspension showing a FICIs index ≤ 0.5. However, there was weak interaction found for the combination of TM and AmB in vitro against Candida spp on matured biofilm cells. Combination of TM + AmB exhibited reduction in biofilm growth at high concentration and no significant were observed compared to the growth control cells (P > 0.05). However, no antagonistic activity was observed in the strains tested. Moreover, observation by bright-field light microscope of combination of TM and AmB treated cells confirmed that growth of cells was virtually completely inhibited only in the presence of high concentration of TM and AmB. Nonetheless, in vivo testing needs to be performed to support these findings. Combination of TM and AmB exhibits synergistic effects against four different planktonic Candida spp. However, combination of these antifungal agents was not effective against biofilms cell. Due to the results of planktonic cells combination does not always match, this suggests the need for drug combination studies in biofilm settings.