INFECTIOUS DISEASES (BACTERIAL, FUNGAL, VIRAL, PARASITIC, INFESTATIONS)

THE ROLE OF RETINOIDS FOR THE CONTROL OF FUNGAL INFECTIONS

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Introduction: Invasive fungal infections (IFIs) are the major complication in hematologic and neoplastic patients leading to severe morbidity and mortality. IFIs are estimated to be responsible for approximately 1.5 to 2 million deaths every year. Over the last decades, the incidence of IFIs constantly increased, due to the concurrent growth of immunocompromised patients, the broad use of antibiotics and chemotherapies, amplified number of bone marrow and organ transplants and prolonged use of corticosteroids. Candida albicans and Aspergillus fumigatus are the most invasive opportunistic pathogens in immunocompromised patients. All-trans retinoic acids (ATRA) is an active metabolite of vitamin A with anti-inflammatory and immunoregulatory properties. On the basis of our previous studies on topical use of the retinoid derivative tazarotene on nails fungal infections, we documented a strong fungistatic activity of ATRA against A. fumigatus and C. albicans.

Objective: Our aim was to investigate in vitro the antifungal efficacy of ATRA and its potential mechanism of action. by blocking the fungal heat shock protein (HSP)-90.

Materials and methods: We assessed different concentrations of Atra ranging from 0.125 to 1 mM against A. fumigatus and C. albicans.

Results: Atra at 0.5 and 1 mM displayed a remarkable fungistatic activity on both fungi, blocking their germination, by interfering with the fungal HSP90 ATP binding site.

Conclusions. This is the first evidence of a direct fungistatic activity of ATRA. The antifungal effect together with its immunomodulatory properties, make ATRA an excellent candidate

for new combined antifungal strategies for the treatment and/or prevention of systemic mycoses in immunocompromised patients.