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IL 17A AND IL 22 IN PATIENTS WITH CANDIDEMIA, CANDIDA COLONIZED ICU PATIENTS AND HEALTHY CONTROLS

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Objectives
IL 17A is considered an important component in host defense against fungal infections. Whereas live Candida albicans cells in vitro dampens host defense by downregulating IL 17A production heat killed Candida albicans induces IL 17A. IL 22 protects mucosal-sites from growth of Candida albicans by inducing anticandicidal proteins. The interplay between Candida and interleukins have been studied in murine as well as in ex vivo human studies but data of IL 17A and IL 22 from patients with invasive fungal infections, candidemia, or Candida colonized patients are lacking. We therefore determined IL 17A and IL 22 in healthy adults (group 1, n=35), intubated and mechanically ventilated ICU patients with and without Candida colonization but without pneumonia (group 2, n=20), intubated and mechanically ventilated ICU patients with and without Candida colonization but with pneumonia (group 3, n=35), and in candidemic patients (group 4, n=27).

Methods
Cytokines were simultaneously determined according to the instructions of the manufacturer (Bio-Plex Pro™ Human Th17 Cytokine Plex Assay**,** Biorad, Hercules, CA 94547). Standard curves for each analyte were generated by using the reference analyte concentration supplied by the manufacturers. Each sample was performed in triplicates on different 96-well. Cytokine concentrations were calculated using a five-parameter standard curve derived from three measurements of reference cytokine concentrations supplied by the manufacturer. Candida cultures from lower respiratory tract (enbobronchial secretions in healthy individuals, bronchoalveolar lavages in group 2 and 3), oral swabs (group 1-3) and from blood (group 2-4) were performed by routine microbiological methods.

Results
Candida cultures from lower respiratory tract and oral swabs were positive in 1/35 and 10/35 in group 1, 4/20 and 11/20 in group 2, 16/35 and 27/35 in group 3 patients, respectively. Blood cultures were negative in all patients from group 2 and 3. Candidemic patients had higher IL 17A levels (0.9 to 13.69 pg/ml, mean 2.33) compared to all other groups ($p<0.05$ for all comparisons). Intubated and mechanically ventilated ICU pneumonia patients (group 3) had higher IL 17A levels (0.9 to 5.04, mean 1.2pg/ml) compared to healthy individuals ($p=0.02$). There were 5/35 patients with elevated IL 17A levels in this ICU group. There was no difference of IL 22 in all 4 groups.

Conclusions
IL17A and not IL22 is elevated in patients with candidemia and in intubated mechanically ventilated ICU pneumonia patients with Candida colonization compared to healthy controls.