Summary

Candida species are the leading cause of invasive fungal infections in humans, producing infections that range from non–life-threatening mucocutaneous disorders to invasive disease that can involve any organ. In recent years novel antifungal agents have been released, significantly increasing options for the treatment of most serious fungal infections. The most recent approved antifungal drugs include those in the echinocandin class (caspofungin, micafungin, and anidulafungin), as well as the newer generation triazoles voriconazole and posaconazole.

In this respect we have conducted studies in defining the efficacy of caspofungin in treating systemic infections with two *Candida* species. First the *in vivo* efficacy against *C. albicans* was investigated. In a study with three *C. albicans* isolates single dose of six mg/kg, two times three mg/kg, six doses of one mg/kg efficacy have been examined in the two sub-studies including lethality and tissue burden in neutropenic murine models. In lethality experiments, all treatment regimens improved survival ($p<0.0014$ for all three isolates); differences among the treated groups were not statistically significant. The kidney fungal burdens for the two of isolates were counted in every day for the six-day study period continuously. The six mg/kg dose on the first three days made a significant change in decreasing the colony numbers ($p<0.05$-0.001), but in a longer period from forth to sixth day of study there was no difference among the treated groups ($p<0.05$).

The second study investigated the efficacy of caspofungin against *C. tropicalis* using an intraperitoneal infection model using a *C. tropicalis* isolate showing paradoxical growth *in vitro*. In this study a variety of caspofungin doses (0.12, 0.25, 1, 2, 3, 5, and 15 mg/kg) were used in one and daily doses for five-day of studies. The single doses of caspofungin were effective only at 5 and 15 mg/kg concentrations (100% survival). Five-day caspofungin treatment led to 100 % survival at 1 mg/kg and higher doses. Caspofungin treatment significantly decreased the number of viable yeasts in the peritoneal lavage samples as well as in the infected abscesses at 1 mg/kg as well as higher doses in comparison to the untreated control group ($p<0.001$ in all cases), and even to the group treated with 0.12 mg/kg of caspofungin ($p<0.05$ in all cases).

These results strongly suggest that antifungal therapy should be started at earliest time possible. More studies are required to examine the beneficial and therapeutic role of infrequently larger echinocandins doses for using in the clinical routine and determining a better dosing regimen using the echinocandins specific charateristics.