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MOLDI-TOF based identification and anti-fungal susceptibilities of *Trichosporon* isolates causing invasive fungal diseases in China, 2010-2014

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Background: To evaluate the performance of two matrix-assisted laser desorption/ionization time-of-flight mass spectrometry systems (MALDI-TOF MS) for identification of clinical important *Trichosporon* isolates and explore the species distribution and susceptibility profiles of *Trichosporon* species causing invasive infections across China.

Material/methods: A total of 79 *Trichosporon* isolates were recovered from the National China Hospital Invasive Fungal Surveillance Net (CHIF-NET) program (2010-2014). Species identification was performed by VITEK MS and Bruker Biotyper MS system. Both direct smear and formic acid extraction method were evaluated and compared to IGS/ITS sequencing. MICs were determined by Sensititre YeastOne against fluconazole, voriconazole, itraconazole, posaconazole, caspofungin, micafungin, anidulafungin, amphotericin B and 5-flucytosine.

Results: Finally, nine *Trichosporon* species were identified: *T. asahii* (62), *T. dermatis* (4), *T. japonicum* (4), *T. inkin* (3), *T. dohaense* (2), *T. asteroides* (1), *T. faecale* (1), *T. jirovecii* (1) and *T.*

montevideense (1) by IGS/ITS sequencing. Blood (41.8%) was the most popular specimen type, followed by catheter (13.9%) and ascitic fluid (12.7%). Four *Trichosporon* species were isolated from bloodstream infections, mainly *T. asahii* (81.8%), followed by *T. japonicum* (9.1%), *T. dermatitis* (6.1%) and *T. dohaense* (3.0%). The VITEK MS and Bruker Biotyper MS correctly identified 82.3% and 91.1% of 79 *Trichosporon* isolates (P=0.101), 98.4% and 100% of *T. asahii*, respectively. For Bruker Biotyper MS, formic acid extraction method was more proficient than direct smear, as to VITEK MS, direct smear was more suitable. 79.7% (63/79) of *Trichosporon* isolates had high amphotericin B MICs ($\geq 2\mu\text{g/ml}$). The three echinocandins had no in vitro activities against all isolates (MIC $\geq 8\mu\text{g/ml}$). About 15.2% (12/79) of *Trichosporon* isolates exhibited decreased susceptibility to fluconazole (MICs $\geq 16\mu\text{g/ml}$). Most of the strains were susceptible to itraconazole, voriconazole and posaconazole (MICs $\leq 1\mu\text{g/ml}$).

Conclusions: *T. asahii* was the predominant species causing invasive trichosporosis and three uncommon species has emerged as pathogens of *Trichosporon* fungemia. The accuracy of Bruker Biotyper MS was more capable than VITEK MS, especially for non-*asahii* species. Triazoles seem to be the most promising agents for antifungal therapy of trichosporosis.