Comparison of Bruker BioTyper and bioMérieux Vitek-MS for Rapid MALDI-TOF Identification of Candida spp.

B. M. Willey, P. Lo, J. Fuller, S. M. Poutanen

Mount Sinai Hospital/Univ. Health Network, ON; Univ. of Toronto, ON; Provincial Laboratory, Edmonton, AB; Canada

ABSTRACT

Objectives: Reporting sterile site yeast ID at the time of isolation will improve patient safety and reduce costs by avoiding use of inappropriate anti-fungal therapy. This study assessed MALDI-TOF ID accuracy using retrospective, previously characterized, clinically significant strains from the Alberta Provincial Laboratory.

Methods: IDs of 169 Candida were confirmed by Vitek II YSI01 and API20C on receipt in Toronto. To evaluate the Bruker BioTyper (BRBT) and bioMérieux Vitek-MS (VTMS), yeasts were grown on 5% sheep blood (BA) and Sabouraud (SA) agar for blinded, parallel testing (SA after 16h at 37°C; BA after 22h and 36h at 37°C). As instructed, colonies were applied to reusable BRBT target via wooden toothpick, and to VTMS slide via plastic 1ul loop. Formic acid extractions were completed directly on the target/slide for both systems. If a “No reliable ID” was obtained, the test was repeated.

Results: All yeast were identified correctly by BRBT and VTMS from SA and BA (67 C. albicans, 49 C. glabrata, 11 C. krusei, 16 C. dublensis, 2 C. lusitaniae, 11 C. parapsilosis, and 12 C. tropicalis). 16h growth was generally good on SA: only 2 (1.2%) and 5 (2.9%) required re-testing on BRBT and VTMS, respectively. On BA at 22h/36h, C. glabrata growth was often poor: 34% (21/62) were re-tested by BRBT vs. 4% (3/67) by VTMS. This difference appeared due to the application method (toothpick vs. loop) rather than to an ID deficiency, since reliable ID was achieved if loops were used on yeasts with poor growth for BRBT.

Conclusions: Both the BRBT and VTMS were equally able to accurately ID all Candida using MALDI-TOF. For BRBT, ID was more easily achieved from SA than BA given the propensity for C. glabrata to grow poorly on BA. However, use of a plastic loop improved the ability of BRBT to ID C. glabrata from poor growth.

INTRODUCTION

Yeasts often take 3 days or more to identify in the clinical laboratory using conventional testing, and as a consequence, patients are most often treated empirically. When the correct species identity is not predicted, inappropriate therapy may have been used for a prolonged period before the organism identity becomes available.

Rapid identification should improve patient care as it will prevent initiation of inappropriate therapy in cases of infection with intrinsically resistant species and will allow for earlier tailoring of therapy in cases with susceptible species. Appropriate patient care is cost-effective as it reduces morbidity and mortality rates and decreases hospital stay.

Rapid identification will also significantly reduce laboratory expenditures since less supplies/labour are required.

OBJECTIVES

To assess MALDI-TOF MS for rapid identification of clinical Candida spp. by performing a head-to-head comparison of the Bruker MALDI BioTyper and the bioMérieux VITEK-MS systems.