Comparison of Vitek 2 YS08 with Sensititre YeastOne for Candida susceptibility testing

Sir,
An early and accurate antifungal susceptibility result is important for the treatment of invasive candidiasis. Sensititre YeastOne (Thermo Scientific, USA) has good concordance with the standard Clinical and Laboratory Standards Institute (CLSI) reference method for Candida susceptibility testing, and therefore is a widely utilised commercial method of determining Candida susceptibility. The automated Vitek 2 AST YS08 (bioMérieux, France) has advantages in decreased turnaround time, reduced costs and ease of use; however, there are limited data regarding its performance for resistant isolates.

A total of 68 clinical isolates of Candida species, many known to have antifungal resistance, were tested by Vitek 2 AST YS08 and the Sensititre YeastOne method according to the manufacturer’s instructions. They were comprised of Candida albicans (n=20), Candida glabrata (n=21), Candida tropicalis (n=9), Candida parapsilosis (n=10) and Candida krusei (n=8). Candida species were identified with a log score >2.0 using the MALDI Biotyper (Bruker, USA). Essential agreement was defined as ≤2 minimum inhibitory concentration (MIC) dilution difference and categorical agreement was obtained when the MIC result fell within the same interpretive categories according to CLSI breakpoints for azoles and echinocandins, and according to the epidemiological cutoff values for amphotericin B. Very major errors, major errors and minor errors were defined according to a prior study, with Sensititre YeastOne as the reference method. Very major errors occurred where the reference method categorised the isolate as resistant and Vitek 2 categorised it as susceptible. Major errors occurred where the reference method categorised the isolate as susceptible and Vitek 2 categorised it as resistant. Minor errors occurred where one of the methods categorised the isolate as susceptible or resistant and the other method categorised the isolate as intermediate or susceptible dose dependent.

Table 1 demonstrates that essential agreement and categorical agreement were suboptimal for fluconazole and voriconazole with some very major errors, while there was good agreement for the other antifungals tested, acknowledging the lack of isolates which were non-susceptible to micafungin and amphotericin. Poor agreement for fluconazole was largely found in C. albicans whereas essential agreement occurred in 14/20 isolates and categorical agreement in 17/20 isolates. Poor agreement for voriconazole was predominantly found in C. krusei where essential agreement occurred in 2/8 isolates and categorical agreement occurred in only 2/8 isolates, mostly classified as minor errors. Caspofungin non-susceptibility occurred predominantly in C. glabrata complex and it was in this species complex that poor categorical agreement for caspofungin occurred with essential agreement in 15/15 isolates and categorical agreement in 5/15 isolates, mostly classified as minor errors.

Table 1 Comparison of Vitek 2 AST YS08 to reference method Sensititre YeastOne Candida susceptibility testing

<table>
<thead>
<tr>
<th>Antifungal agents</th>
<th>Isolates (n)</th>
<th>Resistant (n)</th>
<th>I/SDD (%)</th>
<th>EA (%)</th>
<th>CA (%)</th>
<th>Misclassified isolates (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluconazole</td>
<td>39</td>
<td>18</td>
<td>1</td>
<td>77</td>
<td>90</td>
<td>0 2 2</td>
</tr>
<tr>
<td>Voriconazole</td>
<td>47</td>
<td>14</td>
<td>11</td>
<td>79</td>
<td>66</td>
<td>1 2 1 13</td>
</tr>
<tr>
<td>Caspofungin</td>
<td>62</td>
<td>3</td>
<td>7</td>
<td>100</td>
<td>82</td>
<td>0 2 9</td>
</tr>
<tr>
<td>Micafungin</td>
<td>54</td>
<td>1</td>
<td>0</td>
<td>100</td>
<td>100</td>
<td>0 0 0</td>
</tr>
<tr>
<td>Amphotericin</td>
<td>67</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>100</td>
<td>0 0 0</td>
</tr>
<tr>
<td>Flucytosinec</td>
<td>68 NA</td>
<td>NA NA NA</td>
<td>99 NA NA</td>
<td>NA NA</td>
<td>NA NA</td>
<td></td>
</tr>
</tbody>
</table>

CA, categorical agreement; EA, essential agreement; mE, minor errors; ME, major errors; VME, very major errors.

* Vitek 2 AST YS08 does not provide results for Candida glabrata against fluconazole and voriconazole, nor for Candida krusei against fluconazole. Six isolates for caspofungin and one isolate for amphotericin terminated by Vitek AST YS08 so did not allow comparison. Fourteen isolates were not tested for micafungin by YeastOne so did not allow comparison.
* Resistant or intermediate/susceptible dose dependent according to Sensititre YeastOne results with CLSI interpretative criteria.
* There is no CLSI breakpoint or epidemiological cutoff value for flucytosine, therefore no CA was calculated.

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A descriptive account of sequential nailfold capillaroscopy in scleroderma

Sir,

Microvasculopathy is an early and prominent pathological feature of systemic sclerosis (SSc), or scleroderma, and is most easily recognised in the capillaries of the nailfold using the simple technique of nailfold capillaroscopy (NFC).1 Many studies have confirmed that NFC has proven utility in the early diagnosis of SSc and it has been included in the classification criteria for this disease since 1988.1 However, to date there is little information concerning sequential NFC in scleroderma and whether documentation of nailfold capillary morphology and density over time may assist in disease management and prognosis.

In this current study we have compared and contrasted sequential nailfold capillary density and morphological characteristics in both healthy subjects and scleroderma patients for periods of up to 12 months.

There were nine patients in the scleroderma study group, three with diffuse cutaneous scleroderma, five with limited cutaneous scleroderma and one with overlap scleroderma. All patients were recruited from the South Australian Scleroderma Register and all patients fulfilled the diagnosis of scleroderma according to the American College of Rheumatology/European League Against Rheumatism (ACR/EULAR) 2013 classification criteria and stratified as limited cutaneous, diffuse cutaneous or overlap scleroderma according to LeRoy’s criteria.2–4 The demographics, clinical and serological features and medications of the scleroderma study group (at entry to the study) are shown in Table 1.

There were four healthy control subjects, three females and one male with an age span of 28–66 years. None were smokers and none had Raynaud’s phenomenon. NFC was performed on both patients and controls at regular intervals over the year study period.

NFC was performed on the fourth finger nailfold of each hand using a Capiscop (supplied by KK Technology, United Kingdom). Paraffin oil or KY jelly was applied to the nailbed to reduce the skin/air refractive barrier. The Capiscop technique allows visualisation of the nailfold capillaries at magnifications of 100× and 300× and has the capability of digitalisation of the nailfold images or video capillaroscopy. The procedure was done exactly as described in the Capiscop user’s manual enabling the capture of multiple digitalised images.2 Overlapping images were then aligned and electronically spliced to form a composite mosaic of the nailfold and its capillary arcades. The microvasculature was then assessed from the digitalised images. In particular, we assessed either quantitatively or qualitatively the symmetry or otherwise of the capillary arcades, the morphology and dimensions (normal size dilated or grossly dilated (giant) of the capillary loops, nailfold capillary density, the presence and appearances of capillary microbleeds and the appearance of the cuticle (widened, roughened, discoloured)).

Capillary density was measured from the digitalised nailfold images of each nailfold by the direct observation method.