Evaluation of CHROMagar candida for rapid identification and Etest for antifungal susceptibility testing in a district general hospital laboratory

The incidence and clinical importance of fungal infections in immunocompromised patients is increasing, and the isolation of multiple yeast species from clinical specimens is not uncommon. Candida albicans remains the most frequently isolated yeast species; but others, inherently or potentially resistant to the most frequently isolated yeast species; but microdilution methods for antifungal susceptibility testing in a clinical laboratory routine.1

Over a period of 10 weeks, 31 yeast isolates were recovered on SDA, from 22 patients in intensive care, HIV, and Oncology/District general hospital laboratory. The incidence and clinical importance of fungal infections in immunocompromised patients is increasing, and the isolation of multiple yeast species from clinical specimens is not uncommon. Candida albicans remains the most frequently isolated yeast species; but others, inherently or potentially resistant to the most frequently isolated yeast species; but microdilution methods for antifungal susceptibility testing in a clinical laboratory routine.1

Unlike sabouraud dextrose agar (SDA) (LabM, Bury, UK), CHROMagar candida (Mast Diagnostics, Bootle, UK), a chromogenic, differential culture medium, can detect mixed populations and facilitate rapid, accurate identification of C albicans.1

The procedure for antifungal susceptibility testing by the broth based NCCLS reference method M27-A is time consuming.1 The Etest (AB BIODISK, Solna, Sweden), a simple alternative agar based quantitative diffusion method, can be readily incorporated into a clinical laboratory routine.1

Twenty five isolates, yielding green colonies, were identified as C albicans (germ tube positive). Six isolates, yielding non-green colonies and germ tube negative, were identified as C glabrata (four), C parapsilosis (one), and C norvegensis (one; unidentified by API 20C AUX, but confirmed by Centraalbureau voor Schimmelcultures, Delft). Amphotericin B, fluconazole, and itraconazole MICs were determined by our laboratory (laboratory 1) using API 20C AUX (Bio Mérieux, Basingstoke, UK).

Table 1 MIC ranges for yeast isolates as determined by Etest and spectrophotometric broth microdilution methods

<table>
<thead>
<tr>
<th>Antifungals</th>
<th>Methods</th>
<th>MIC range (mg/litre)</th>
<th>(MIC_{50}) (mg/litre)</th>
<th>(MIC_{90}) (mg/litre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphoterincin B</td>
<td>Etest RPMI/casitone (lab 1)</td>
<td>0.125 to 1/0.06 to 0.25</td>
<td>0.25</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>Etest RPMI/casitone (lab 2)</td>
<td>0.125 to 1/0.06 to 0.25</td>
<td>0.25</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>Broth microdilution (lab 3)</td>
<td>0.06 to 0.125</td>
<td>0.25</td>
<td>0.5</td>
</tr>
<tr>
<td>Fluconazole</td>
<td>Etest RPMI/casitone (lab 1)</td>
<td>0.125 to 0.5</td>
<td>0.25</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>Etest RPMI/casitone (lab 2)</td>
<td>0.25 to 0.5</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Broth microdilution (lab 3)</td>
<td>0.125 to 0.25</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Itraconazole</td>
<td>Etest RPMI/casitone (lab 1)</td>
<td>0.06 to 0.25</td>
<td>0.25 to 0.5</td>
<td>0.25/0.5</td>
</tr>
<tr>
<td></td>
<td>Etest RPMI/casitone (lab 2)</td>
<td>0.06 to 0.25</td>
<td>0.25 to 0.5</td>
<td>0.25/0.5</td>
</tr>
<tr>
<td></td>
<td>Broth microdilution (lab 3)</td>
<td>0.008 to 0.125</td>
<td>0.008</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1 Fluconazole (FL): change of morphology at endpoint. MIC, 48 mg/litre; itraconazole (IT): sharp end point. MIC, 0.5 mg/litre.

Itraconazole Etest RPMI/casitone (lab 1) 0.03 to 32/0.125 to 1/0.25 > 32/0.25 > 32/32
| | Etest RPMI/casitone (lab 2) | 0.03 to 32/0.125 to 1/0.25 > 32/0.25 > 32/32 |
| | Broth microdilution (lab 3) | 0.008 to 0.125 | 0.008 |

Etest MICs, determined after 48 hours on RPMI and casitone agar, was 100% and 97% (amphotericin B), 97% and 90% (fluconazole), and 90% and 87% (itraconazole), respectively. The correlation between the Etest MICs using RPMI and casitone agar at 48 hours and the spectrophotometric method was 94% and 77% (amphotericin B), 100% and 65% (fluconazole), and 32% and 13% (itraconazole), respectively. Etest MICs on RPMI were more reproducible and correlated better with the spectrophotometric method than those on casitone agar (table 1). Etest MICs for itraconazole were greater than those obtained by the spectrophotometric method. Trailling endpoints (fig 1) did not hinder the interpretation of the fluconazole Etests, and isolates exhibiting itraconazole resistance by the Etest were not all confirmed by the spectrophotometric method. The itraconazole discrepancy between Etests and broth spectrophotometry is high, and further work is needed to obtain a better correlation. The correct selection of MIC end points is crucial, and might have had an impact on the results.

The rapid identification and accurate susceptibility testing of yeast would help to modify treatment and influence clinical outcome. We conclude that CHROMagar candida and Etest are worth considering in a district general hospital setting.

We would like to thank Å Karlsson (laboratory 2) and F Odds (laboratory 3) for their valuable comments and for performing the susceptibility testing.

amendment. The time consuming nature of in predetermined situations to aid manual antibiotic sensitivities on laboratory reports. Rule bases can be built into the system in use in UK medical microbiology laboratories. The use of the Reflection computer formulation in the medical microbiology laboratory is the input of the medical microbiologist in laboratory supervision and being recorded.

Figure 1 The Reflection toolbar program has the facility to record both text and function keystrokes and allow these to be played back. The “string to transmit” box shows the letters and function keys being recorded.

Diagnostic Pathology of Parasitic Infections with Clinical Correlations. Gutierrez Y. (£125.00.) Oxford University Press, 2000. ISBN 0 19 512143 0

The determination of parasites in tissue sections is generally regarded as one of the most difficult aspects of the diagnosis of parasitic infections. Very few good books about this topic are available, which makes Diagnostic Pathology of Parasitic Infections by Yazid Gutierrez most welcome.

This impressive book of 769 pages includes, according to the author, all parasites described until now in human tissues. The book is intended as a diagnostic tool for anatomical pathologists confronted with unknown parasites in tissue sections. Because of this orientation, aspects dealing with diagnosis in the clinical laboratory are only briefly mentioned. Morphological features of most of the protozoa, nematodes, trematodes, cestodes, and arthropods are discussed extensively in the text and illustrated with high quality (black and white) photographs and diagrams. In addition, several diagnostic stages are illustrated within 16 colour plates in the middle section of the book.

What makes the book of special interest is the link between the pathology observed in the tissues and the (extensive) description of clinical symptomatology of the infection. In this way a unique insight into the different host–parasite interactions is given.

In general, the chapters are well written. However, in this 2000 edition, the literature cited in some sections is a little outdated (most of the more recent references are from 1996 to 1997, with only a few in 1998). Nonetheless, when a good book about the diagnosis of parasitic stages in tissue samples and extensive clinical information of parasitic the infection is wanted, this book can be recommended.

T VAN GOOL

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WHO classification in Table 25.7. An insilium is present, and the ILCSG classifications are essentially the same, very easy to distinguish with immunohistochemistry in paratrabecular lymphoma in the past, but now paratrabecular infiltrates represent localisation of lymphoma has a preferential paratrabecular subtypes of non-Hodgkin's lymphomas are possible: in general, the background information (especially on pathophysiology) for different types of haemolytic disorders should be given, at least to alert the pathologist to the possibility of detecting a non-Hodgkin's lymphoma. However, it is of limited value to obtain adequate (background) information.

P. KLUIJN

Calendar of events

Full details of events to be included should be sent to Maggie Butler, Technical Editor JCP, The Cedars, 56 Queen Street, Castle Hedington, ESSEX CO9 3HA, UK; email: maggiebutler@pilotree.prestel.co.uk

BSCC Northern Spring Tutorial: Gynaecological Cytology
8 March 2001, Manchester, UK
Further details: BSCC Office, PO Box 352, Uxbridge UB10 9TX, UK. (Tel +44 01895 274 020; fax +44 01895 274 080; email leslie.couch@psilink.co.uk)

Urological Surgical Pathology for the Practising Pathologist
24–26 March 2001, Sanibel Harbour Resort and Spa, Fort Myers, Florida, USA
Further details: Department of Continuing Education, Harvard Medical school, 25 Shattuck Street, Boston, MA 02115, USA.
(Tel +1 617 432 1525; fax +1 617 432 1562; email hms-cme@hms.harvard.edu)

Haematology Morphology
26–27 March 2001, St Mary's Hospital, London, UK

Further details: The Academic Secretary, Department of Haematology, St Mary's Hospital Campus of ICSM, Norfolk Place, London W2 1PG, UK. (Fax +44 020 7262 5418)

Histopathology of the Bone Marrow
28 March 2001, St Mary's Hospital, London, UK
Further details: The Academic Secretary, Department of Haematology, St Mary's Hospital Campus of ICSM, Norfolk Place, London W2 1PG, UK. (Fax +44 020 7262 5418)

Haematological Morphology and Leukaemia Classification for Cytogeneticists
Further details: The Academic Secretary, Department of Haematology, St Mary's Hospital Campus of ICSM, Norfolk Place, London W2 1PG, UK. (Fax +44 020 7262 5418)

6th European Forum on Quality Improvement in Health Care
29–31 March 2001, Bologna, Italy
Further details: BMA/BMJ Conference Unit, BMA House, Tavistock Square, London WC1H 9JR, UK. (Tel +44 020 7383 6409; fax +44 020 7383 6869; email Quality@bma.org.uk; website www.quality.bmj.org)

BSCC London Spring Tutorial: Lung and Pleural Cavity Fluid Cytology
27 April 2001, Guy's Hospital, London, UK
Further details: BSCC Office, PO Box 352, Uxbridge UB10 9TX, UK. (Tel +44 01895 274 020; fax +44 01895 274 080; email leslie.couch@psilink.co.uk)

International Consultation on the Diagnosis of Noninvasive Urothelial Neoplasms
11–12 May 2001, University of Ancona School of Medicine, Torrette, Ancona, Italy
Further details: R Montironi, Ancona Italy (email r.montironi@popsci.unian.it), DG Bostwick, Richmond, VA, USA (email bostwick@bostwicklaboratories.com), P-F Bassi, Padua, Italy (email bassipf@ux1.unipd.it), M Droller, New York, USA (email mdroller@smplink.mssm.edu), or D Waters, Seattle, WA, USA (email waters@vet.vet.purdue.edu)
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