Correspondence

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 (Table 1) MIC ranges for yeast isolates as determined by Etest and spectrophotometric broth

tion at 37°

Intensive care, HIV, and Oncology/Infectious diseases are also being reported.

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.

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

Over a period of 10 weeks, 31 yeast isolates were recovered on SDA, from 22 patients in a district general hospital laboratory setting.

The quality control strains used by laboratory 1 were C albicans ATCC 90028 and C glabrata ATCC 90030; laboratories 2 and 3 used C parapsilosis ATCC 22019 and C krusei ATCC 6258 as controls.

The results obtained with these strains 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. Trailing 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 Etest discrepancy between Etests and broth spectrophotometry is high, and further work is needed to obtain a better correlation.

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

We conclude that CHROMagar candida and Etest are worth considering in a district general hospital setting.

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>MIC90 (mg/litre)</th>
<th>MIC90 (mg/litre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphotericin B</td>
<td>Etest RPMI/casitone (lab 1)</td>
<td>0.125 to 0.5125</td>
<td>0.25/0.5125</td>
<td>0.5/0.5125</td>
</tr>
<tr>
<td></td>
<td>Etest RPMI/casitone (lab 2)</td>
<td>0.125 to 0.5125</td>
<td>0.25/0.5125</td>
<td>0.5/0.5125</td>
</tr>
<tr>
<td></td>
<td>Broth microdilution (lab 3)</td>
<td>0.06 to 0.03</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 0.5125</td>
<td>0.25/0.5125</td>
<td>0.5/0.5125</td>
</tr>
<tr>
<td></td>
<td>Etest RPMI/casitone (lab 2)</td>
<td>0.125 to 0.5125</td>
<td>0.25/0.5125</td>
<td>0.5/0.5125</td>
</tr>
<tr>
<td></td>
<td>Broth microdilution (lab 3)</td>
<td>0.125 to 0.5125</td>
<td>0.25</td>
<td>0.5</td>
</tr>
<tr>
<td>Itraconazole</td>
<td>Etest RPMI/casitone (lab 1)</td>
<td>0.03 to 0.5125</td>
<td>0.25/0.5125</td>
<td>0.5/0.5125</td>
</tr>
<tr>
<td></td>
<td>Etest RPMI/casitone (lab 2)</td>
<td>0.03 to 0.5125</td>
<td>0.25/0.5125</td>
<td>0.5/0.5125</td>
</tr>
<tr>
<td></td>
<td>Broth microdilution (lab 3)</td>
<td>0.008 to 0.008</td>
<td>0.008</td>
<td>0.008</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.

The use of the Reflection computer program for facilitating report formulation in the medical microbiology laboratory

There are several different computer systems in use in UK medical microbiology laboratories. Rule bases can be built into the system for the automatic release of comments or antibiotic sensitivities on laboratory reports for the automatic release of comments or antibiotic sensitivities. For example, to enter a comment:

- Icon 1 = to arrive at the comment entry point = five keystrokes.
- Icon 2 = comment “contaminated urine sample, please send a repeat” = 44 keystrokes.
- Icon 3 = to return to the main menu = five keystrokes.

In this example 54 keystrokes have been reduced to three.

Different toolbars can be created for each group of samples—for example, sputum, urine, etc.

Figure 1 shows three toolbars open simultaneously, thus allowing toolbars to be used together. Customised toolbars can be saved on to disc, allowing them to be used on different machines, or for different users to have their own customised disc.

An important feature of a UK microbiology laboratory is the input of the medical microbiologist in laboratory supervision and report authorisation. Report amendment can be time consuming but can make a report amendment. This enables a toolbar to be created with icons on which a frequently used string of keystrokes can be recorded then played back by clicking on the icon. The computer can therefore be used like a tape recorder by recording keystrokes instead of sound. Figure 1 demonstrates the creation of an icon.

The method can be used to assist various functions, such as comment entry or amendment of technical variables for test automation.

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The use of Reflection is a software component, it can incorporate features unavailable to a terminal.

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Biopsy Interpretation of Bone and Bone Marrow is a second, completely revised edition of a similar book published in 1985 by the same authors, but the book also resembles the Atlas of Bone Marrow Pathology published in 1990 by these authors.

In 31 chapters, the authors give a comprehensive overview of the diagnostic features of most disorders of the bone and bone marrow. After four introductory chapters, nine chapters are entirely dedicated to bone diseases. In chapter 14, metastatic bone disease is described, and in the following chapters most bone marrow disorders including the lymphoproliferative disorders are described. Sometimes, an introductory chapter precedes more specific chapters.

The book contains highly valuable information on issues that are not easily found in other text books, especially on bone diseases. It reflects the enormous experience of both authors in this field of diagnostic pathology.

In general, each chapter is clearly written and contains comprehensive tables either listing general features of a specific disorder, clinical characteristics, histological characteristics, or checklists.

The layout is excellent and the illustrations (most representing Giemsa stained slides of plastic embedded biopsies) with the schematic drawings are really superb.

However, there is also some criticism possible: in general, the background information (especially on pathophysiology) for each disorder is limited and the text is often relatively superficial. Just to give one example, in chapter 18, brief information on the different types of haemolytic disorders should be given, at least to alert the pathologist to the possibility of detecting a non-Hodgkin's lymphoma in the biopsy in association with cold agglutinin disease.

In some chapters, the data are incorrect. For instance, in the lymphoma chapters 25 and 27, data on the localisation of specific subtypes of non-Hodgkin's lymphomas are given. According to these data mantle cell lymphoma has a preferential paratrabeclar localisation. This is incorrect, the infiltrates in mantle cell lymphoma being patchy and entirely random. It is likely that the described paratrabeclar infiltrates represent localisation of follicle centre cell lymphomas with very few centroblasts often mixed up with centrocytic lymphoma in the past, but now very easy to distinguish with immunohistochimistry. An amusing error is shown in tables 25.6 and 25.7 because the REAL and ILSG classifications are essentially the same, the author probably referring to the novel WHO classification in table 25.7. An insufficient updating in this area is also illustrated by the absence of more recently described entities such as hepatosplenic γδ T cell lymphoma with a diagnostic intrasinusoidal pattern of neoplastic T cells, best visible in bone marrow biopsies. In these chapters on lymphomas many other (small) errors, also concerning the cytogenetic data, can be found.

One disturbing general feature of the book is the lack of specific references in the text, whereas the references are listed alphabetically after each chapter. This makes it almost impossible to go back to the original literature data. A related weakness is the lack of quotation of sources in cases where detailed numerical data are given. For instance, in chapter 14 metastatic bone disease is described and data on the incidence of metastasis in breast cancer, prostate cancer, etc, are given. These data seem to be derived from the authors’ large collections, but it is unclear how these series were selected (for instance, an incidence of 42% positive bone marrow biopsies in a random series of patients with breast cancer is very high and suggests that this represented a selected series of patients with advanced disease).

In summary, this book is an excellent atlas of bone and bone marrow pathology and as such it is an important adjunct for each (haematology)pathologist. However, it is of limited value to obtain adequate (background) information.

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**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@pilstoree.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 lesley.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
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