Short Report

Evaluation of the Antigen Specific to the Mycelial Phase of Candida albicans in the Serodiagnosis of Candidiasis

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Umenai, T. and Chiba, H. Evaluation of the Antigen Specific to the Mycelial Phase of Candida albicans in the Serodiagnosis of Candidiasis. Tohoku J. exp. Med., 1977, 123 (4), 395-396 — We demonstrated 2 different antibodies against Candida albicans in patients' sera, the detection rates were proportional to the severity of candidiasis. One antibody was directed toward antigen shared by Candida in both blastospore and mycelial phases and the other was directed against antigen found only in the mycelial phase of Candida. The presence of the latter may reflect the invasive form of candidiasis.

Immunological tests developed so far for the detection of systemic candidiasis leave still something to be improved. This might be attributed to the antigen used (Venezia and Robertson 1974). Evans et al. (1973) and Syverson et al. (1975) reported the cytoplasmic antigen specific to mycelial Candida which were recovered from patients with invasive candidiasis (Kozinn and Taschdjian 1962) and suggested that the use of the antigen should lead us to distinguish systemic candidiasis from saprophitic one. The aim of our experiment is to confirm their suggestion.

We cultured C. albicans serotype A for 16 hr in neopepton-starch broth (pH 7.5) at 40°C to obtain mycelium (Chattaway et al. 1968) and also at 25°C to gain blastospores, which were then disrupted in a Braun's homogenizer. The homogenized mixture was centrifuged at 40,000 x g for 1 hr at 4°C. The dialyzed solution was used as antigen after its protein content was adjusted to 10 mg/ml by phosphate buffered saline. Sera from 4 groups were examined for the presence of antibody by the immunodiffusion method in 1% agarose. Group 1 was composed of 50 healthy students who were negative for Candida culture from the throat and urine. Group 2 was composed of 31 patients without clinical sign of candidiasis but with positive culture from the throat. Group 3 was composed of 19 patients with localized candidiasis and Group 4 was composed of 5 patients shown to have suffered from systemic candidiasis by postmortem examination.

Fig. 1 shows precipitating lines observed in the reaction between serum from a patient and antigens. The line formed by blastospore antigen and the serum fused with that formed by mycelial antigen and the serum, which indicated that blastospore and mycelia have an identical antigen. Another line was made up by mycelial antigen and the serum and it was revealed that mycelium has not only the antigen shared by blastospore but the other one which is not found in blastospore. We designated the former B antigen and the latter M antigen.

Table 1 shows the detection rate of both M and B antibodies in sera. B antibody was observed in 4 out of 5 sera of Group 4, 13 out of 19 of Group 3 and 10 out of 31 of Group 2, whereas it was not observed in sera of Group 1. M antibody was not detected in sera of
Fig. 1. Demonstration of *Candida albicans* precipitin of blastospore and mycelial antigens against a patient's serum by double-diffusion (Ouchterlony) in 1% agar. A, patient's serum; B, antigen prepared from blastospore; M, antigen prepared from mycelium.

**TABLE 1. Occurrence of Candida albicans precipitin**

<table>
<thead>
<tr>
<th>Group (Number of subjects)</th>
<th>Against antigen from blastospore phase (B antigen*)</th>
<th>Against antigen from mycelial phase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B antigen*</td>
<td>M antigen†</td>
</tr>
<tr>
<td>Group 1 (50)</td>
<td>0(0)‡</td>
<td>0(0) 0(0)</td>
</tr>
<tr>
<td>Group 2 (31)</td>
<td>10(32.3)</td>
<td>9(29) 0(0)</td>
</tr>
<tr>
<td>Group 3 (19)</td>
<td>13(68.4)</td>
<td>12(63.2) 6(31.6)</td>
</tr>
<tr>
<td>Group 4 (5)</td>
<td>4(80)</td>
<td>4(80)</td>
</tr>
</tbody>
</table>

* Antigen common to both blastospore and mycelium.
† Antigen specific to mycelium.
‡ Percentages are given in the parentheses.

Groups 1 and 2, but it was detected in 6 out of 19 of Group 3 and 4 out of 5 of Group 4. Detection rates of both B and M antibodies were in proportion to the severity of the infection, though the former was demonstrated at higher rates than the latter.

Follow-up study revealed that 3 patients in Group 3, who were M antibody positive, got afflicted with systemic candidiasis later. This result might suggest that the presence of M antibody fortells the occurrence of invasive candidiasis.

**References**