Galactomannan Enzymatic Immunoassay Cross-Reactivity Caused by Prototheca Species


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We report a reactive Aspergillus galactomannan enzymatic immunoassay against the serum of a patient with invasive Prototheca zopfii infection. Analysis of the supernatants of suspensions of P. zopfii and other Prototheca isolates revealed positive results as well. These data suggest cross-reactivity with the serum Aspergillus galactomannan assay in invasive protothecosis.

Prototheca species are classified as achlorophyllic algae and are opportunistic pathogens (7). Prototheca infections are generally divided into three groups: olecranon bursitis, localized cutaneous infections, and disseminated disease. The latter is more commonly reported in severely immunocompromised individuals, whereas localized infections can present in patients with normal host immunity (9). Therapeutic recommendations for protothecal infections are limited because susceptibility profiles are variable and do not correlate with successful treatment (8). Generally, treatment consists of medical and/or surgical therapy. Based on data from several case reports and in vitro studies, amphotericin B is presumably the most effective therapy (8, 9). Correct identification of Prototheca species is of therapeutic and prognostic value but may be difficult due to their yeast-like colony appearance on routine media (14). Here, we report on another possible misleading aspect of invasive protothecosis.

We describe the case of a 63-year-old man diagnosed with follicular B-cell non-Hodgkin’s lymphoma (stage IV) in 1999. Following two relapses (2007 and 2010), autologous (2008) and allogeneic (2010) stem cell transplantation were performed. Subsequently, he developed chronic graft versus host disease (GVHD) in the summer of 2011, which was treated with cyclosporine and methylprednisone. Because the patient was unable to ingest sufficient food and did not tolerate posaconazole antifungal prophylaxis, as recommended by the European Organization for Research and Treatment of Cancer/Mycosis Study Group (EORTC/MSG) definitions (3) were seen. However, in GVHD patients, elevated galactomannan levels due to translocation of dietary galactomannan through the intestinal mucosa into the blood have been described (1, 6, 11). Other possible known causes of false-positive galactomannan results were excluded (12, 16, 19). Because coinfection with P. zopfii and Aspergillus spp. was rather unlikely, cross-reactivity in the Platelia Aspergillus assay caused by Prototheca was suspected.

To investigate the occurrence of reactivity in the serum galac-
The serum galactomannan enzymatic immunoassay is widely used for the performance of the galactomannan assay. Comparative studies have illustrated the presence of glucose and mannose in both species but the absence of galactose in P. zopfii (10). It is unclear how cross-reactivity originated. The molecule responsible for cross-reactivity might be a structural component of the cell wall or a secreted glycoprotein.

The impact of this newly detected cross-reactivity is expected to be limited, as invasive protothecosis has a low prevalence (9). However, differentiation between Aspergillus and Prototheca is important for the choice of antifungal therapy; echinocandins can be used to treat invasive aspergillosis, whereas no data are available for their activity against Prototheca spp. (15). This report confirms once more that positive galactomannan levels should be interpreted with caution.

Both clinical Prototheca strains have been deposited in the BCCM/IHEM collection (P. wickerhamii, IHEM 25446; and P. zopfii, IHEM 25445).

Nucleotide sequence accession number. The 18S rRNA sequence for P. zopfii has been deposited in GenBank under accession no. JQ679396.

ACKNOWLEDGMENT

A possible conflict of interest is that we receive annual funding from Pfizer for the performance of the galactomannan assay.

REFERENCES


