

Chapter 7

Laboratory Diagnosis of Ocular Fungal Infections

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7.1. CONVENTIONAL MICROBIOLOGIC TECHNIQUES

The prompt diagnosis of mycoses requires a high index of suspicion and an appreciation of specific risk factors that may predispose a patient to ocular fungal infections. Determination of the identity of the specific etiological agent of mycotic disease is very important for the therapeutic considerations. For example using azoles or, amphotericin B is inadequate for many fungal infections. Classical diagnosis of fungal infections depends on direct microscopic examination or staining of tissue sections and the isolation of the fungus in culture. Tests for the detection of antibodies and antigens, metabolites and fungus specific nucleic acids and other methods such as confocal microscopy have great appeal. Radiographic imaging of the orbit and paranasal sinuses is invaluable for both the initial evaluation and for monitoring disease progression and response to treatment of sinoorbital disease ^{1,2}.

7.1.1. Direct Microscopy (KOH, Gram, Giemsa, Calcofluor Stains)

Direct microscopic examination of specimens is generally considered to be among the most rapid and cost-effective means of diagnosing ocular fungal infections. Most of organisms that can be specifically identified by direct microscopy, because they possess a distinctive morphology. Potassium hydroxide (KOH) preparations have sensitivities ranging between 89% and 99% for the detection of fungi. Giemsa, combined with calcofluor white also has high

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mass spectra of fungal cells after a certain period of exposure to different concentrations of antifungal agents. Despite shortening the identification time, proteomic susceptibility tests cannot be directly applied to primary clinical samples and that culture is still needed to obtain enough fungal cells ⁵⁵.

Tear proteins are produced from the main and accessory lacrimal glands, as well as ocular surface epithelial cells. There are some studies about the tear proteins might be used as a clinical source to investigate fungal keratitis. Tear could be used as biomarkers to diagnose or monitor patients with fungal keratitis ⁵⁶.

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