Lamoth L, M. Cruciani, C. Mengoli, E. Castagnola, O. Lortholary, M. Richardson, O. Marchetti (2012), on behalf of the Third European Conference on Infections in Leukemia (ECIL-3). Beta-Glucan Antigenemia for the Diagnosis of Invasive Fungal Infections in Patients with Hematological Malignancies: a Systematic Review and Meta-Analysis of Cohort Studies from the Third European Conference on Infections in Leukemia (ECIL-3). *Clinical Infectious Diseases*, 54 (5): 633-43.

Background. Invasive fungal infections (IFIs) are life-threatening complications in patients with hemato-oncological malignancies, and early diagnosis is crucial for outcome. The compound 1,3-β-D-glucan (BG), a cell wall component of most fungal species, can be detected in blood during IFI. Four commercial BG antigenemia assays are available (Fungitell, Fungitec-G, Wako, and Maruha). This meta-analysis from the Third European Conference on Infections in Leukemia (ECIL-3) assessed the performance of BG assays for the diagnosis of IFI in hemato-oncological patients.

Methods. Studies reporting the performance of BG antigenemia assays for the diagnosis of IFI (European Organization for Research and Treatment of Cancer and Mycoses Study Group criteria) in hemato-oncological patients were identified. The analysis was focused on high-quality cohort studies with exclusion of case-control studies. Meta-analysis was performed by conventional meta-analytical pooling and bivariate analysis.

Results. Six cohort studies were included (1771 adult patients with 414 IFIs of which 215 were proven or probable). Similar performance was observed among the different BG assays. For the cutoff recommended by the manufacturer, the diagnostic performance of the BG assay in proven or probable IFI was better with 2 consecutive positive test results (diagnostic odds ratio for 2 consecutive vs one single positive results, 111.8 [95% confidence interval {CI}, 38.6–324.1] vs 16.3 [95% CI, 6.5–40.8], respectively; heterogeneity index for 2 consecutive vs one single positive results, 0% vs 72.6%, respectively). For 2 consecutive tests, sensitivity and specificity were 49.6% (95% CI, 34.0%–65.3%) and 98.9% (95% CI, 97.4%–99.5%), respectively. Estimated positive and negative predictive values for an IFI prevalence of 10% were 83.5% and 94.6%, respectively.

Conclusions. Different BG assays have similar accuracy for the diagnosis of IFI in hemato-oncological patients. Two consecutive positive antigenemia assays have very high specificity, positive predictive value, and negative predictive value. Because sensitivity is low, the test needs to be combined with clinical, radiological, and microbiological findings.