Invasive fungal infections (IFI) caused by Aspergillus species are the most common fungal infections in neutropenic settings such as seen in recipients of allogeneic or autologous haematopoietic stem cell transplantation (HSCT), or haematopoietic neoplasies, and are the second most common IFI in solid organ transplant recipients (SOT) and solid tumor patients (1-3). Invasive aspergillosis (IA) has been increasingly reported in immunocompromised hosts, and has become the leading infectious cause of death in immunocompromised hosts. The 1,3β-D-glucan (BDG) molecule is a cell wall component present in most fungi other than Aspergillus spp (eg, Candida spp, Fusarium spp, Acremonium spp, and Pneumocystis jirovecii); the exceptions are Cryptococcus spp and some species from Mucorales. Serum or plasma GM and BDG measurements have been extensively studied, gaining widespread acceptance as sensitive methods for diagnosis and prospective surveillance in groups at high risk for IA (4,7). The Fungitell® assay, manufactured byAssociates Cape Cod Inc. (USA), is a chromogenic kinetic test that has been approved by the United States Food and Drug Administration in 2003 and also carries the European CE label for the presumptive diagnosis of IFI. However, the major limitations of BG testing for routine use are false positive reactions from interfering substances (8-9).

Objectives and Methods

This study was undertaken to examine the performance of the Fungitell β-glucan (BDG) assay, in serum and bronchoalveolar lavage (BAL), for the diagnosis of invasive aspergillosis (IA) in immunocompromised hosts. Methods: We performed a prospective study from December 2008 to March 2013, patients undergoing HSCT, hematologic malignancy, solid organ transplantation (SOT), rheumatologic disease, solid tumor or pulmonary disease from 2008 to March 2013, patients undergoing HSCT, bronchoalveolar lavage (BAL), for the diagnosis of invasive fungal infections: validation, cutoff development, and comparison with galactomannan. The results were compared with galactomannan, (G), immunocompromised patients. Serum samples from 165 subjects, 55 cases with proven or probable IA (n = 39) and 109 controls with the same underlying conditions but without IA and with other diseases such as tuberculosis, herpes, sepsis, sepsis syndrome, lymphoma, toxoplasmosis, cytomegalovirus, another invasive fungal infection and lung cancer. The BAL from 56 subjects, 30 cases with proven (n = 22) or probable (n = 22) IA, and 26 controls were the same group of serum sample. The sensitivity, specificity, negative predictive values, positive predictive values, along with their associated 95% confidence intervals (CIs), were calculated for BAL GM and BD testing and serum (at different optical density [OD] cut off values.

The BG assay performance for diagnosis of IA, was limited by low specificity in serum and BAL. The usefulness of BG test in routine screening, where the IA is majority of invasive fungal infections, remains limited in regard to its inadequate specificity, high costs and its use should be restricted to settings where other fungi are also prevalent.

For serum analysis, the area under ROC curve (AUC) was 0.62, the best cut-off point was 140 pg/mL, with the sensitivity, specificity of 49.1% and 75.2% respectively. For the BAL analysis, the area under ROC curve (AUC) was 0.62, the best cut-off point was the same of serum, 140 pg/mL, with the sensitivity, specificity of 46.7% and 76.9% respectively Table 1 and 2.

References

Copyright © 2015 Author Martin Vieira Baltra. pmartim@hc.fmrp.usp.br. Financial support. FAPESP 15/05212-1. LIN 64; HFMUSP; Faculdade de Medicina.