Predictors of 6-week mortality in patients with positive bronchoalveolar lavage galactomannan

Zoe Weiss, MD; Nour Ismail, MD; Audrey Le, MD; David Kubiak, Pharm D; Dimitrios Farmakiotis, MD, FACP; and Sophia Koo, MD, FIDSA

1Department of Internal Medicine, Warren Alpert Medical School of Brown University, Providence, RI; 2Division of Infectious Diseases, Brigham and Women's Hospital, Harvard Medical School, Boston, MA; 3Division of Infectious Diseases, Warren Alpert Medical School of Brown University, Providence, RI

Background

- BAL GM is a mycologic criterion for diagnosis of probable invasive aspergillosis (IA)\(^1\).
- In a contemporary cohort of consecutive patients with BAL GM measured as part of their workup for potential IA, we previously showed that 42% of positive (≥0.5) BAL GM values were positive; positive predictive value (PPV) was increased by using higher cut-offs and in patient groups with high pre-test probability for IA\(^2\).
- In this study from the same cohort, we analyze the prognostic value of BAL GM and identify predictors of 6-week mortality, the main outcome in most studies of mold-active antifungal drugs.

Methods

- We reviewed clinical and microbiologic data of patients who had ≥1 positive BAL GM (≥0.5), at Brigham and Women's Hospital (BWH) (11/2009-3/2016).
- We applied EORTC/MSG invasive mold infection (IMI) definitions to classify cases as possible, probable or proven IMI, excluding BAL GM result as mycologic criterion\(^2\).
- Categorical variables were compared between groups using the \(\chi^2\) or Fisher exact tests. We used the log-rank test, including comparison for trend, and Cox regression models to identify factors associated with 6-week all-cause mortality.

Results

- We included 134 patients (median age 58, 49% women, 55% with hematologic malignancy (HM), 10% solid organ (SOT) and 34% hematopoietic stem-cell transplant recipients).
- PPV of BAL GM was higher in patients with HM or SOT (P<0.01) (Figure 1) and with higher cutoff values (BAL GM ≥1 vs. 1-0.8 vs. 0.8-0.5: P<0.01).
- Six-week crude mortality was 34% (45/134) overall: 75% for proven (3/4), 44% for probable (27/61), 29% for possible (4/14), and 20% for no IMI (11/55) (P=0.001 by \(\chi^2\) for trend and by log-rank for trend).
- ICU stay, mechanical ventilation, acute kidney injury, corticosteroids, hypertension, antifungal treatment were associated with higher mortality in univariate, but not multivariate analyses. APACHE II score, liver disease, shock were independently associated with higher 6-week mortality.
- BAL GM value was independently associated with 6-week mortality in all patients (adjusted Hazard Ratio 1.25 (continuous variable), 95% CI 1.11-1.4, P<0.001), and in those with possible, probable or proven IMI, but not in patients without IMI (Figure 2).
- Antifungal treatment was associated with higher mortality in patients without (p=0.052), but not in those with possible, probable or proven IMI.

Conclusions

- Higher BAL GM values were an independent predictor of 6-week mortality, having prognostic value in patients with possible, probable or proven IMI, but not in patients who did not meet other criteria for IMI.
- We propose critical reassessment of BAL GM cut-off values in different patient populations.

References