

Clinical and microbiological implications of time-to-positivity of blood cultures in patients with Gram-negative bacilli bacteremia.

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Abstract

Time-to-positivity (TTP) is defined as the length of time from the beginning of culture incubation to the detection of bacterial growth by an automated system. The objective of this study was to assess the clinical and microbiological implications of TTP among patients with Gram-negative bacilli (GNB) bacteremia. This was a prospective, single-center, observational study. Patients aged 18 years or older with one or more blood cultures growing GNB were included and followed until hospital discharge or death. Patients were excluded if they were without symptoms of infection, if they had polymicrobial culture, or if the culture was positive with an obligate anaerobe. A multivariate logistic regression analysis was performed to determine the predictors of in-hospital mortality, including TTP (primary endpoint), demographics, disease severity, comorbidities, pathogen type, source of infection, time to symptom resolution, hospital/intensive care unit (ICU) length of stay, adequacy of empiric antibiotics, and presence of an extended-spectrum beta-lactamase (ESBL)-producing bacteria. One hundred consecutive patients with GNB bacteremia were enrolled. TTP was an independent predictor of mortality; for every hour that TTP was shorter, the risk of mortality increased by 10% [odds ratio (OR) 1.10, 95% confidence interval (CI) 1.00-1.21, $p = 0.049$]. Other predictors of mortality included severity of illness, ESBL-producing GNB, and ICU admission within 24 h before culture. Mortality was highest among patients with inadequate empiric therapy (56% vs. 14%, $p < 0.001$) and TTP <11 h (23.1% vs. 8.3%, $p = 0.18$). Lactose-fermenting GNB had a shorter mean TTP than non-lactose fermenters (11.4 vs. 17.9 h, $p = 0.001$). Among patients with bacteremia due to GNB, TTP values are inversely associated with mortality risk.

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