β-D-Glucan Assay for Diagnosis of Invasive Candidiasis in ICU Patients: A Pilot Study from India
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Background
• The β-D-Glucan assay (BDG) has been very recently introduced in India.
• It is recommended for the early diagnosis of invasive candidiasis (IC).
• There are a number of factors (e.g., β-lactam antibiotics, immunoglobulin and albumin infusions, bacteremia) which may falsely elevate BDG levels.

Methods
• This was a retrospective, observational study done in the 24 bedded multi-disciplinary ICU of a tertiary care hospital in South India.
• Case records of adult (> 18 years) non-neutropenic patients having features of sepsis or septic shock with ≥ 1 risk factor for IC were analysed.
• For all patients, blood for BDG assay was drawn and empiric antifungals were started on the day of suspicion of IC.
• Neutropenic or immunocompromised patients, those already on antifungals and those who were diagnosed with invasive fungal infections other than IC were excluded from the study.
• The FDA approved Fungitell assay was used to measure serum BDG levels (pg/mL).

Results
• Patients were divided into 3 groups.
  • Group 1 (n=16): patients in whom diagnosis of IC was confirmed (blood culture or another sterile site grew candida).
  • Group 2 (n = 30): patients in whom an alternative etiology of severe sepsis or septic shock was found or did not improve after administration of anti-fungals.
  • Group 3 (n = 31): patients in whom neither the diagnosis of IC was confirmed nor an alternative explanation for sepsis was found, but improved clinically on antifungal therapy.
• Mean BDG levels was significantly higher in Group 1 (448.75 ± 88.30) as compared to Group 2 (144.46 ± 82.49) and Group 3 (292.90 ± 137.0).
• The presence of conditions which cause false elevation of BDG like β-lactam antibiotics, IV albumin and bacteremia were significantly higher in Group 2.
• Although the mean Candida Score (CS) was >2.5 in all three groups there was no significant difference in inter-group analysis.

Conclusion
• A BDG assay cut-off of 80 pg/mL leads to a high number of false positive results in ICU patients, where false positive factors are unavoidable.
• The results of this study suggest a higher cut-off of at least 144 pg/mL will be more specific for IC, although this may need further validation with larger trials.