Eswab™ for the Collection of Fungal Surveillance Culture from Immunocompromised Patients


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ABSTRACT

Introduction:
Fungal infections are an important cause of morbidity and mortality in immunocompromised patients especially when they are undergoing chemotherapy treatment for cancer or are immune suppressed because of bone-marrow recipients or solid organ transplantation. Candida and Aspergillus species are the most common fungal pathogens responsible for invasive fungal infection (IFI). Unfortunately, the diagnosis of IFIs remains difficult and it is often confirmed late. The value of fungal surveillance cultures (SCs) as predictors of IFIs is well known and consists of swabs such as throat, nasal and rectal. Eswab is a Liquid Based Microbiology device used in our institution for all clinical specimens for the diagnosis of infectious diseases including fungal. The objective of this study was to demonstrate the performance of Eswab for the collection of clinical specimens for the detection of fungal and yeast in SCs.

Methods:
The study was carried out on 23148 samples received by the microbiology laboratory of the Tor Vergata Polyclinic December from May 2009 to December 2015. All samples were collected in Eswab from immunocompromised patients (hematology, oncohematology, Mediterranean Institute of hematology and stem cell transplantation). The SCs for the detection of yeasts and filamentous fungi were performed on nasal swabs, throat swabs and rectal swabs. In particular 12,499 nasal swabs (54%), 8796 throat swabs (38%) and 1852 rectal swabs (8%) were processed. Eswab specimens were loaded on the WASP plated on Sabouraud Gentamicin Chloramphenicol 2agar, incubated at 37°C for the first 24 hours, then maintained at 28°C. plates were observed daily and after 15 days they were reported as negative. If positive, the identifications were performed by using Vitek 2 System cards (VST, bioMérieux) for yeasts and by microscopic exam (using lactophenol cotton blue stain) as well as MALDI-TOF System (Bruker Daltonics) for filamentous fungi (Fi). In some occasion Fi required identification by gene sequencing, which was carried out by performing amplification and nucleotide sequencing of 18S rRNA partial gene

REFERENCES

RESULTS

Yeast and molds can be easily detected (in an elapsed time ranging from 24-48 and 48-5 days for yeast and fungi, respectively) from all clinical specimens submitted in Eswab, demonstrating that it is a good system for preserving the viability of yeasts and fungi. The very low percentage of positive surveillance cultures ought to impose a mediation on the real microbiological value of such practice.

CONCLUSIONS

On the basis of our findings, in patients under chemotherapy treatment for cancer or are immune suppressed because of bone-marrow recipients or solid organ transplantation the Eswab device demonstrated a good performance in terms of sensitivity. However, the diagnosis of IFIs remains difficult and it is often confirmed late. The value of fungal surveillance cultures (SCs) as predictors of IFIs is well known and consists of swabs such as throat, nasal and rectal. Eswab is a Liquid Based Microbiology device used in our institution for all clinical specimens for the diagnosis of infectious diseases including fungal. The objective of this study was to demonstrate the performance of Eswab for the collection of clinical specimens for the detection of fungal and yeast in SCs.

CLINICAL CASES

Top left: A patient who has an invasive fungal infection due to Scopulariopsis brevipes Top right: a patient with fungal infection due to Rhodoturula mucilaginosa. A most common specie (55.9%) followed by Candida tropicalis (15.8%), Candida glabrata (9.7%) and Candida parapsilosis (6.1%). Penicillin was isolated in 2.2% of specimens, 3.2% of the isolates were Aspergillus (especially A. fumigatus) while less than 1% (0.8%) was represented by other filamentous fungi. Two clinical cases were highly significant: i) a total case of invasive fungal sinusitis in a bone-marrow transplant recipient in which the fungus was detected 14 days after the admission of the patient; ii) three clinical cases of Glaucoma isolated from central venous catheter and peripheral blood cultures in which the surveillance cultures (particularly the rectal swabs) remained consistently negative even during the invasive infection.

Conclusion:
Fungal and fungal FI were easily detected (in an elapsed time ranging from 24-48 and 48-5 days for yeast and fungi, respectively) from all clinical specimens submitted in Eswab, demonstrating that it is a good system for preserving the viability of yeasts and fungi. The very low percentage of positive surveillance cultures ought to impose a mediation on the real microbiological value of such practice.