

MOLECULAR DIAGNOSTIC LAB FOR INFECTIOUS DISEASES

Research article content:

1. Occurrence of *Candida albicans* and *Candida non-albicans* in critical care unit patients and their antifungal susceptibility pattern in a tertiary care hospital, Mysore, Karnataka

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Background: *Candida* species being a part of normal commensal flora, is capable of causing severe infections in human in both immunocompromised and immunocompetent patients. The prevalence of *C. albicans* and Non-*albicans Candida* (NAC) in critically ill patients and their treatment management along with emergence of antifungal resistance is a major challenge to the primary care providers.

Methods: This study was conducted for a period of 18 months. The clinical samples were collected from ICU patients and were cultured onto Sabouraud Dextrose Agar for isolation. Species identification and their antifungal susceptibility testing were carried out by the automated system, VITEK2 Compact.

Results: Non-*albicans Candida* (79.48%) were predominantly isolated than *Candida albicans* (20.51%). Among the NAC spp, *C. tropicalis* (68.98%) were significantly isolated followed by *C. parapsilosis* (6.50%); *C. glabrata* (5.42%); *C. guillermondii* (4.55%); *C. famata* (2.81%); *C. krusei* (2.16%); *C. haemulonii* (1.73%); *C. ciferrii* (1.08%), *C.*

lusitaniae (1.08%), *C. rugosa* (1.08%), *C. utilis* (1.08%); *C. lipolytica* (0.86%). Rate of occurrence of *Candida* spp. in blood sample is 2.08%, 9.97% in urine samples, 2.64% in Sputum samples, 1.91% in Endotracheal aspirates. Occurrence of *Candida* spp. were high in Surgical ICU (14.48%) followed by ICU (11.89%), Medical Care Unit (7.06%), Respiratory ICU (5.51%), Neonatal ICU (3.96%). *C. tropicalis* showed drug resistance to Flucytosine (6.28%), Fluconazole (18.55%), and Amphotericin-B (8%). *C. albicans* showed a higher drug resistance to Micafungin and Voriconazole than NAC spp.

Conclusion: Substantial increase of Non-*albicans* *Candida* in critical care units and their antifungal resistance can be managed by prompt detection, rational usage of antifungal drugs.

2. Comparison of Conventional and Molecular Methods in the Detection of *Mycobacterium tuberculosis* in Clinically Suspected Samples of Tuberculosis

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ABSTRACT

Impeded diagnosis in Tuberculosis may be a major cause of morbidity and mortality among particular group of patients, hence better methods are needed for the accurate detection of tuberculosis (TB) among both smear positive and smear negative cases. This study was aimed to compare

conventional and molecular methods in detecting *Mycobacterium tuberculosis* among the clinically suspected cases of TB. A total of 100 clinically diagnosed TB patients were incorporated in this study. All the patients were either admitted or attending JSS Hospital, Mysore during the study period i.e., from January 2018- December 2018. Sputum, Gastric aspirate, Pleural fluid, Ascitic fluid, Pus discharge, CSF and Tissue samples were gathered for smear microscopy, culture (Lowenstein – Jensen medium) and PCR testing. The sensitivity of smear and PCR were compared to that of culture considering as gold standard. 50 of 100 patients were positive on smear microscopy. 51 specimens yielded the growth of *Mycobacterium tuberculosis* on Lowenstein-Jensen's medium and PCR detected the presence of MTB specific gene in 77 specimens. In clinical diagnosis of tuberculosis, molecular methods are probably a useful adjunct certainly in smear negative paucibacillary cases. Early diagnosis of TB is cornerstone for proper treatment and control of this deadly disease. Polymerase chain reaction testing is the most rapid and sensitive method for the diagnosis of tuberculosis while culture is specific but it takes 4 to 8 weeks to provide results and smear testing is the cheapest but least sensitive test.

3. Seroprevalence of *Mycoplasma pneumoniae* and Clinical Profile of Affected Patients in a Tertiary Care Hospital

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ABSTRACT

Introduction: Mycoplasma pneumoniae is the most common causative agent of community acquired pneumonia. Rapid and reliable method for the diagnosis of Mycoplasma pneumoniae infection is important for the appropriate treatment.

Aim: To determine the rapid diagnosis of Mycoplasma pneumoniae pneumonia in a clinically suspected Community Acquired Pneumonia (CAP) cases.

Materials and Methods: A cross-sectional study was carried out in the Department of Microbiology, JSS Hospital, Mysuru, Karnataka, India, for a period of two years from January 2016- January 2018. All the suspected cases of CAP from inpatients and outpatients attending JSS Hospital were enrolled in the study. The samples were subjected to Enzyme Linked Immunosorbent Assay (ELISA) and Indirect Immunofluorescence Assay (IFA) for the detection of IgM antibodies against Mycoplasma pneumoniae.

Results: A total of 200 patients were enrolled in this study. Among which 123 (61.5%) were paediatric population and 77 (38.5%) were adults respectively. A total of 60 samples were positive for IgM antimycoplasma antibody. Out of 60 samples 11 samples were positive by ELISA and 60 samples were positive by IFA. Sensitivity and specificity was found to be 100% and 74.1% of the tests. The prevalence of Mycoplasma pneumonia in the present study was found to be 30%. The most common symptom was cough followed by fever.

Conclusion: Mycoplasma pneumoniae pneumonia constituted to about 30% of CAP in our study. Combination of tests must be carried out along with significant suggestive clinical signs in the clinically suspected cases for the CAP

4. Antifungal resistance of candida species isolated from HIV patients in a tertiary care hospital, Mysuru, Karnataka

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Context: Candidiasis still remains as a common opportunistic infection in patients with human immunodeficiency virus (HIV). Drug resistance has become a serious health concern because of indiscriminate usage and dosage.

Aim: To determine the antifungal resistance pattern of *Candida albicans* and non-*albicans Candida* (NAC) from HIV patients. **Subjects and Methods:** The study was carried out in the department of microbiology at a tertiary care hospital. *Candida* isolates obtained from HIV patients were tested for drug susceptibility by Vitek-2 automated system. **Results:** Antifungal susceptibility pattern (n=109) revealed that 15% of the isolates were resistant to at-least one and 85% were sensitive to all the drugs tested. About 10% and 19% of *C. albicans* showed resistance to fluconazole and flucytosine respectively. Among non-*albicans* tested, only *C. tropicalis* (14%) exhibited resistance to flucytosine. **Conclusions:** Knowledge on epidemiology, species prevalence, and drug resistance pattern may guide for effective therapy. This reduces morbidity and also improves the quality of life.

5. DETECTION OF STAPHYLOCOCCAL SUPER ANTIGEN BY PCR IN PATIENTS WITH PSORIASIS AND TO CORRELATE THE SEVERITY OF PSORIASIS WITH ENTEROTOXIN PRODUCTION

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Introduction: Staphylococcus aureus is a transient or persistent part of the resident flora in anterior nares of 20-50% of the population. Staphylococcus aureus is a major cause of multiple types of infections both in and outside of the hospital setting. Psoriasis is a chronic inflammatory skin disorder affecting 1-2% of the general population. The characteristic lesion of psoriasis is a sharply demarcated erythematous papule or plaque containing hyperproliferating keratinocytes as well as infiltrating neutrophils, monocytes, and T lymphocytes. Patients that harbored toxin-positive S.aureus on their skin had a significantly higher Psoriasis Area and Severity Index score than those with toxin negative S. aureus. With this background, this study was undertaken to detect the Staphylococcal superantigen in the patient of psoriasis. Aim &

Objective: Detection of Staphylococcal Super Antigen by PCR in patients with Psoriasis and to correlate the severity of Psoriasis with Enterotoxin production.

Material & Methods: The present study is a Hospital based prospective study. Clinically diagnosed psoriatic case and Staphylococcus aureus isolated from the above mentioned clinical samples were included. 40 clinically diagnosed psoriatic patients were included in the study and 3 swabs from different sites (psoriatic skin lesion, anterior nares and axillary region) were collected from each patient. To correlate the clinical prognosis among the psoriatic patients PASI score was calculated followed by culture & Sensitivity and Polymerase

chain reaction was carried out to detect Sec, Sea and Sei genes. Result: Of 150 samples processed for culture, 96 Staphylococcus aureus were isolated. From Psoriatic patients 39(97.5%) were isolated from diseased skin lesion; 21(52.5%) from axilla; 36(90%) from anterior nares. All 40 psoriatic patients was scored for PASI and maximum range of 5.1-10.0 was seen in 16(40%) followed by 1.1-5.0 in 11(27.5%). Out of 96 Staphylococcus aureus isolates, superantigen gene was detected in 75(50%) isolates. 48(40.0%) were positive for SEC gene, 37(30.83%) were positive for SEA gene, 27 (22.50%) were positive for SEI gene.

Conclusion: Psoriasis was found to be more frequent in the third and fourth decades of the life. S.aureus seem to play an important role in inducting and triggering of psoriatic lesions. S. aureus on the skin of patients with psoriasis is associated with bacterial super antigen that activates the lot of T-cell lymphocytes. Psoriatic lesions inhabited by enterotoxigenic S. aureus which harboured enterotoxin Sec gene more than Sea and Sei gene.