Indian J Med Res 136, October 2012, pp 671-673

Correspondence

Candida parapsilosis: an emerging fungal pathogen

Sir,

Candidemia is the most common invasive mycotic infection across India. It is most commonly seen in immunosuppressed or immunocompromised patients. The important risk factors include the use of immunosuppressive drugs, and/or broad-spectrum antibiotic therapy, abdominal surgery, parenteral nutrition, haemodialysis, haematological disorders, HIV infections, solid tumours, mucosal or cutaneous barrier disruption, extremes of age, prolonged ICU stay and central venous catheter use[1-5]. *Candida albicans* is of the foremost importance as opportunistic pathogen in immunocompromised hosts, which may cause life threatening infections. In the recent years, an increase in opportunistic infections caused by other *Candida* species, *viz. C. tropicalis*, *C. parapsilosis, C. krusei* and *C. glabrata*, has been increasingly reported[2-5]. The epidemiology of systemic *Candida* infections varies in different regions, and frequently from one hospital to another within the same region[2]. Further, *C. glabrata* and *C. krusei* have been noted to have decreased susceptibility or resistance to fluconazole[6,7]. In India, mortality in candidemia varies from 28 to 71.4 per cent[1]. Rapid and accurate species identification is necessary to optimize the choice of antifungal therapy. The aim of this study was to assess the candidemia profile in clinically diagnosed consecutive cases of fungemia at Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Puducherry, by germ tube production, morphology on corn meal agar (CMA) and colour production on Hichrom candida agar[8,9]. Antifungal susceptibility of the isolated *Candida* species was tested by disc diffusion method against amphotericin B (10 U) and fluconazole (25 µg) on Mueller-Hinton Agar supplemented with 2 per cent glucose and methylene blue (5 µg/ml). Zone diameter endpoints were read at 80 per cent growth inhibition and were interpreted as per approved Clinical and Laboratory Standards Institute (CLSI - M44-A) guidelines[10].

Candida species were isolated from 31 patients (50%) from the 62 blood samples received in the mycology section, Department of Microbiology, JIPMER, Puducherry, during October 2009 to March 2010. Of the 31 isolates, 19 (61.3%) were isolated from females and 12 (38.7%) from males; 80.6 per cent (n=25) were isolated from patients admitted in intensive care units (ICU); 61.3 per cent (n=19) isolates were obtained from patients with age ≤10 yr, 12.9 per cent (n=4) from ≥51 yr, 6.5 per cent (n=2) each from 21-30 and 41-50 yr, and 9.7 per cent (n=3) from 31-40 yr.

Species identified by morphology on corn meal agar (CMA) and Hichrom candida agar were the same. Most common isolate was *C. parapsilosis* (64.5%) followed by *C. tropicalis* (19.4%), *C. albicans* (9.7%) and *C. glabrata* (6.5%). Only two species of *C. albicans* were isolated and both were germ tube test positive. Twenty nine isolates (93.5%) were sensitive to amphotericin B and 24 (77.4%) to fluconazole by disc diffusion method.

Candida was isolated more from female subjects as compared with male subjects in our study whereas it was isolated predominantly from male subjects in similar study from Brazil[2] and Kerala[11]. Extremes of age are important risk factor for candidemia[4]. *Candida* was isolated most frequently from children ≤10 yr and those ≥51 yr of age group in our study. Candidemia is growing problem in intensive care unit (ICU) patients, as shown in our study also. The results coroborated with the other studies from India[11,12]. A surveillance programme (SENTRY) of bloodstream infections (BSI) in the United States, Canada, Latin America, and Europe from 1997 through 1999 detected 50 per cent isolates from ICU admitted patients[13].

Most of the laboratories use germ tube test for the rapid and cost-effective presumptive identification of *C. albicans*[14,15]. It has been reported that up to 5 per cent of *C. albicans* isolates are germ tube negative[15]. Reporting time can be further reduced by using the germ tube test directly from the positive blood culture bottle with 87.1 per cent sensitivity and 100 per cent specificity[16]. Germ tube method, although simple, requires a microscope and a skilled microscopist familiar with mycology methods[14]. Species identification is most commonly done by chromogenic agar or corn meal agar morphology method. We used both the methods and observed 100 per cent concordance between the two methods.

The epidemiology of systemic *Candida* infections varies in different regions[2], but the change in the pattern of yeast profile has been observed globally in recent years. *C. albicans* isolation is decreasing and non-albicans *Candida* especially *C. parapsilosis* isolation is increasing[2-5,11-13,17-22]. The most common pathogen is still *C. albicans* in USA, Europe, Spain and Brazil[2,4,13,18,19] while *C. tropicalis* was isolated predominantly from India[3,11,17]. *C. parapsilosis* was the most common isolate in our study similar to another study from New Delhi[17]. It may be because 61.3 per cent of the isolation was from children (≤10 yr) and *C. parapsilosis* is a predominant pathogen amongst children[18,19,21,22]. It is mandatory to monitor the fungal spectrum in a particular geographical area to obtain relevant epidemiological data and the *Candida* susceptibility profile to anti-fungal drugs to assist in the management and treatment of hospitalized patients with *Candida* infection.

Rakesh Singh* **& S.C. Parija**
Department of Microbiology
Jawaharlal Institute of Postgraduate
Medical Education & Research
Puducherry 605 006, India
**For correspondence*:
drrakesh1976@yahoo.com

References

1. Chakrabarti A, Chatterjee SS, Shivaprakash MR. Overview of opportunistic fungal infections in India. *Nippon Ishinkin Gakkai Zasshi* 2008; *49* : 165-72.
2. Aquino VR, Lunardi LW, Goldani LZ, Barth AL. Prevalence, susceptibility profile for fluconazole and risk factors for candidemia in a tertiary care hospital in southern Brazil. *Braz J Infect Dis* 2005; *9* : 411-8.
3. Saha R, Das S, Kumar A, Kaur IR. Pattern of *Candida* isolates in hospitalized children. *Indian J Pediatr* 2008; *75* : 858-60.
4. Pfaller MA, Diekema DJ. Epidemiology of invasive candidiasis: a persistent public health problem. *Clin Microbiol Rev* 2007; *20* : 133-63.
5. Eggimann P, Garbino J, Pittet D. Epidemiology of *Candida* species infections in critically ill non-immunosuppressed patients. *Lancet Infect Dis* 2003; *3* : 685-702.
6. Rex JH, Pfaller MA, Barry AL, Nelson PW, Webb CD. Antifungal susceptibility testing of isolates from a randomized, multicenter trial of fluconazole versus amphotericin B as treatment of nonneutropenic patients with candidemia. NIAID Mycoses Study Group and the Candidemia Study Group. *Antimicrob Agents Chemother* 1995; *39* : 40-4.
7. Rex JH, Rinaldi MG, Pfaller MA. Resistance of *Candida* species to fluconazole. *Antimicrob Agents Chemother* 1995; *39* : 1-8.
8. Baradkar VP, Mathur M, Kumar S. Hichrom candida agar for identification of *Candida* species. *Indian J Pathol Microbiol* 2010; *53* : 93-5.
9. Koehler AP, Chu KC, Houang ET, Cheng AF. Simple, reliable, and cost-effective yeast identification scheme for the clinical laboratory. *J Clin Microbiol* 1999; *37* : 422-6.
10. National Committee for Clinical Laboratory Standards. *Methods for antifungal disk diffusion susceptibility testing yeast: approved guideline M-44A*. Wayne, Pa, USA: National Committee for Clinical Laboratory Standards; 2004.
11. Shivaprakasha S, Radhakrishnan K, Karim PM. *Candida* spp. other than *Candida albicans*: a major cause of fungaemia in a tertiary care centre. *Indian J Med Microbiol* 2007; *25* : 405-7.
12. Capoor MR, Nair D, Deb M, Verma PK, Srivastava L, Aggarwal P. Emergence of non-albicans *Candida* species and antifungal resistance in a tertiary care hospital. *Jpn J Infect Dis* 2005; *58* : 344-8.
13. Pfaller MA, Diekema DJ, Jones RN, Sader HS, Fluit AC, Hollis RJ, *et al*. SENTRY Participant Group. International surveillance of bloodstream infections due to *Candida* species: frequency of occurrence and *in vitro* susceptibilities to fluconazole, ravuconazole, and voriconazole of isolates collected from 1997 through 1999 in the SENTRY antimicrobial surveillance program. *J Clin Microbiol* 2001; *39* : 3254-9.
14. Heelan JS, Siliezar D, Coon K. Comparison of rapid testing methods for enzyme production with the germ tube method for presumptive identification of *Candida albicans*. *J Clin Microbiol* 1996; *34* : 2847-9.
15. Merlino J, Tambosis E, Veal D. Chromogenic tube test for presumptive identification or confirmation of isolates as *Candida albicans*. *J Clin Microbiol* 1998; *36* : 1157-9.
16. Sheppard DC, Locas MC, Restieri C, Laverdiere M. Utility of the germ tube test for direct identification of *Candida albicans* from positive blood culture bottles. *J Clin Microbiol* 2008; *46* : 3508-9.
17. Xess I, Jain N, Hasan F, Mandal P, Banerjee U. Epidemiology of candidemia in a tertiary care centre of north India: 5-year study. *Infection* 2007; *35* : 256-9.
18. Pemán J, Cantón E, Orero A, Viudes A, Frasquet J, Gobernado M. Epidemiology of candidemia in Spain - Multicenter study. *Rev Iberoam Micol* 2002; *19* : 30-5.

19. Almirante B, Rodríguez D, Park BJ, Cuenca-Estrella M, Planes AM, Almela M, *et al*; Barcelona Candidemia Project Study Group. Epidemiology and predictors of mortality in cases of *Candida* bloodstream infection: results from population-based surveillance, Barcelona, Spain, from 2002 to 2003. *J Clin Microbiol* 2005; *43* : 1829-35.

20. Safdar A, Perlin DS, Armstrong D. Hematogenous infections due to *Candida parapsilosis*: changing trends in fungemic patients at a comprehensive cancer center during the last four decades. *Diagn Microbiol Infect Dis* 2002; *44* : 11-6.

21. Levy I, Rubin LG, Vasishtha S, Tucci V, Sood SK. Emergence of *Candida parapsilosis* as the predominant species causing candidemia in children. *Clin Infect Dis* 1998; *26* : 1086-8.

22. Kossoff EH, Buescher ES, Karlowicz MG. Candidemia in a neonatal intensive care unit: trends during fifteen years and clinical features of 111 cases. *Pediatr Infect Dis J* 1998; *17* : 504-8.