International Journal of Research
Available at https://edupediapublications.org/journals
p-ISSN: 2348-6848
e-ISSN: 2348-795X
Volume 03 Issue 18
December 2016

Efficacy of CHROMagar for Diagnosis of Candida Species

Dr. Shivam Malhotra, Dr. Varsha A Singh, Dr. Ekta Joshi, Dr. khushboo , Dr. Alia, Dr. Disha

Abstract

Catheter associated urinary tract infections are nosocomial (10-15%) and almost all are caused by Candida spp. Infections caused by non-Candida albicans species are also emerging.In order to facilitate rapid identification, such as Chromogenic media have been developed. These special media yield microbial colonies with varying pigmentation. CHROMagar employs this methodology to allow differentiation of several Candida yeasts by colour and morphology. The study has been carried out with the aim to find the rate of nosocomial candiduria in catheterised patients and compare CHROMagar with sugar assimilation test for species identification of Candida. The present study was carried on 500 urine samples of catheterized patients irrespective of age and sex from MMIMSR, mullana. Urine aspiration was done with 5ml sterile syringe after disinfecting the catheter area to be punctured First sample was collected at the time of admission and then, after 72 hrs of admission . The samples were cultured on Sabouraud's dextrose agar and identification done by colony morphology and Gram staining. Species confirmation done by Morphology on CHROMagar and Sugar assimilation test. The rate of isolation of culture positive patients (33.8%) amongst total number of catheterized patients with p value <0.001 which is significant. The predominance of bacteria as causative organism of UTI in catheterized patients over fungi. The positivity rate of bacterial culture was 59.1% whereas 40.8% for fungal culture. The study showed a p value of < 0.001 which is highly significant.Out of 500 samples 60(12%)showed the growth of Candida species. Candida albicans(66.6%) was predominant pathogen . Within 48 hrs all three species showed growth on CHROM agar while sugar assimilation took more than 72 hours. Morphology of 38(95%) candida albicans were light green,C. tropicalis 11(91.6%) blue purple while C. galabarata 7(87.5) showed purple colour. The sensitivity of Chromagar as for Candida species was 93.3%, significant p value of 0.032

Introduction –

Candiduria is an enigmatic condition, neither a sign nor a symptom and even clearly not a disease. It is the fifth most common cause of nosocomial urinary tract infection in India and ranked eighth among bloodstream pathogens .It is increasing mostly due to the increasing use of indwelling catheters& becoming an important subgroup of nosocomial urinary tract infections (10-15%) caused by almost all Candida spp. catheters are a crucial attribute to virulence as they allow the yeast to attach to body sites and commence proliferation. Candida on its first interaction with the host cause subsequent colonization of surrounding tissue and dissemination throughout the body. Candida albicans was the species that received major clinical attention However , in parallel with the overall increase of fungal infections, it has been observed that infections caused by non-Candida albicans species are also emerging these days. In order to facilitate rapid identification

especially from mixed yeast infections a new Chromogenic media, CHROMagar have been developed which allow differentiation of several Candida yeasts by colour and morphology. The present study was aimed to find out the rate of nosocomial candiduria and to compare the sensitivity, specificity of CHROMagar with conventional sugar assimilation test for rapid identification of Candida species

Material and method-

The present study was carried on 500 urine samples of catheterized patients irrespective of age and sex from MMIMSR, mullana. Urine aspiration was done with 5ml sterile syringe after disinfecting the catheter area to be punctured First sample was collected at the time of admission and then, after 72 hrs of admission . The samples were cultured on Sabouraud's dextrose agar confirmed candida by colony morphology and Gram staining. Species confirmation done by Morphology CHROM agar containing Peptone (10 gm),Glucose (20 gm)Agar (15 gm),Chloramphenicol (0.5 gm)& Chromomeric mix (2 gm). Sugar assimilation test was used as control for confirmation of species.

Result-

The rate of isolation of culture positive patients (33.8%(Table 1= 1) amongst total number of 500 catheterized patients with p value <0.001 which is significant. The positivity rate of bacterial culture was 59.1% whereas 40.8% for fungal culture.(table 2=2) The study showed a p value of < 0.001 which is highly significant.Candida albicans(66.6%) emerged as the predominant fungal pathogen as compared to nonalbicans (33.3%)(Table 3=8) in catheterized patients.Highest rate was shown by Candida. tropicalis (60%) followed by Candida glabrata (40%) .(table 4=9) The findings are significant with p value <0.067. Morphological characters on chrome agar was ,38(95%) candida albicans were light green,C. tropicalis 11(91.6%) blue purple while C. galabarata 7(87.5) showed purple colour.(table 5=12). The sensitivity of Chromagar as for *Candida species* was 93.3%, significant p value of 0.032.

DISSSCSION-

The current study was done on 500 urinary catheterized patients during hospitalization which showed strong association between catheterization and culture positivity in which 33.8%(**Table 1**) of patients were culture positive which is in accordance with Hazelett et al (2006)98 who had reported that 28% of elderly patients received in ICU were diagnosed with UTI during their hospitalization. The documentation of two national surveys in 1996 and 2001 was 36.3% and 42.7% of nosocomial urinary tract infections.The data of present study was comparable with Umesh et al who had reported 33.6% of catheterised patients developed hospital acquired urinary tract infection. The higher incidence of nosocomial urinary tract infection was mainly due to underlying risk factor i.e catheter which becomes a conduit for the entry of organisms inside the bladder. Although, many studies have reported bacterial pathogens as the prime cause for UTIs but fungal pathogens are also emerging these days. The prevalence of fungal infections was more in the immunecompromised patients whereas bacterial infections need no such

prerequisites to occur. Bacteria have specific mechanism to cause disease like its attachment via its adhesion to fimbriae. Thus, the positivity of bacterial cultures was more in comparison to fungal cultures. In the present study, 40.8% were fungal culture positive which was in accordance with Behiry et al[81] who isolated 49% of fungal isolates, while 59.1% were bacterial culture positive which is supported by Daine K. Newman who has reported that approximately 50% of hospitalized patients catheterized develop bacteriuria or fungus in urine.**(Table2)** Infection caused by Candida was attributed to its species amongst which C.albicans was the predominant pathogen. It does not depend upon the immunogenic status of the patient whereas the infections with non albicans species occurs in the patients with impaired immunity i.e. it was more likely to occur in patients suffering from neutropenia or with diabetes mellitus. In this study, rate of C. albicans (66.6%) was higher than non-albicans (36.6%) .Similar results have been reported in the studies done by Orovoca et al[61] and Zakeya Abdulbaqi Bukhary et al[7] where the percentage of C.albicans and non albicans Candida came out to be 72% , 28% and 51%, 16% respectively**(Table 3)** In the present study, most common species of non-albicans isolated were C.tropicalis (60%) followed by C.glabrata (40%). It was due to the virulence factors like adhesion to surfaces and production of various enzymes by Candida tropicalis. This was further supported by the studies done by, Jain et al[53], Weinberger et al[64] and Chaudhary et al in which rate of C.tropicaliscame out to be higher followed by C.glabrata, C.glabrata was more prone to colonise silicone in the presence of urine as it needs nicotinic acid for growth available on the surface of catheter**(Table 4).** Candida albicans had green colour, blue colour by C.tropicalis and purple by C.glabrata. Odds et al[14] also reported green colour for Candida albicans, dark blue for Candida tropicalis and purple for Candida glabrata. This study was in accordance with Baradkar et al[84] in which C. albicans showed colour variability ranging from light green to dark green, C. glabrata from pink to purplish colonies. Vijaya et al[67] reported Candida albicans as blue green. Candida tropicalis as dark blue and Candida glabrata were reported as pink to purple colourd by Patel et al.**(Table 5).**

Conclusion- The present study calls an attention to the fact that there was increased incidence of Nosocomial Candiduria especially in asymptomatic catheterized patients. Candida .albicans was the predominant culprit and Candida.tropicalis outnumbered the non albicans. CHROMagar was highly sensitive, specific and rapid way of identification of Candida species but comes with a backdraw of cost and easy access.

TABLE 1 - Detection of culture positive isolates in catheterized patients.

Total no. of catheterized patients	Total no. culture positive patients	No growth	p value
500	169(33.8%)	331(66.2%)	< 0.001

TABLE 2 – Rate of isolation of bacteria and fungus in culture positive catheterized patients.

Total no. of culture positive patients	Bacterial culture positive	Fungal culture positive	p value
169	100(59.1%)	69(40.8%)	< 0.001

TABLE 3 – Distribution of Candida species in Catheterized patients.

Total no. of Candida isolates	Candida albicans	Candida non – albicans
60	40(66.6%)	20(33.3%)

TABLE 4 - Distribution of Candida non-albicans in catheterised patients.

Total	Candida tropicalis	Candida glabrata	p value
20	12(60%)	8(40%)	<0.067

TABLE 5 - Colony Colour variation of different Candida species on CHROM agar media.

Species	No.	Light green	Dark green	Blue purple	Light pink	Purple
C.albicans	40	38(95 %)	2(5%)	-	-	-
C. tropicalis	12	-	-	11(91.6 %)	1(8.33%)	-
C.glabrata	8	-	-	-	1(12.5%)	7(87.5%)