

TO FIND OUT THE COLONIZATION OF CLOSTRIDIUM DIFFICILE IN PATIENTS WITH MORE THAN 48 HOURS OF ADMISSION AND HAVING GASTROINTESTINAL SYMPTOMS

Dr. Sanjay Singh¹, Dr. Vaibhav Mishra², Dr. Sweta Sahai³, Dr. Deepak Kumar Uikey^{4*}

¹Demonstrator, Department of Microbiology, ABVGMV Vidisha, (M.P.)

²Professor, Department of Microbiology, G.R. Medical college, Gwalior (M.P.)

³Associate Professor, Department of Medicine, G.R. Medical college, Gwalior (M.P.)

⁴Assistant Professor, Dept. of Paediatrics, Atal Bihari Vajpayee Government Medical College, Vidisha (M.P.)

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Corresponding author: Dr. Deepak Kumar Uikey

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Abstract

Background & Method: Place of Study in Department of Microbiology, Gajra Raja Medical College, Gwalior Study was conducted on 600 patients admitted in various wards in G.R. Medical College, Gwalior and associated J A Group of Hospital Gwalior (MP).

Result: Among 600 suspected patients studied, maximum number, 287 (47.83%) belong to age group 19-49 years and minimum number 20 (3.33% belong to more than 75 years age group.

Male were more (58.83%) than female (41.16%) in studied suspected patients.

Fever was the most prevalent presenting symptom with 350 (58.33%) suspected patients. This was followed by abdominal pain 200 (33.33%) patients and diarrhoea in 118 (19.67%) suspected patients.

The least culture positivity was found in suspected patient who had admitted for 3-10 days (2.42 %). The maximum number of positive culture were found in patients with hospital stay more than 26 days which mean that duration of hospital stay correlate with positivity of culture.

C. difficile was isolated in 5.71 % of the gastric acid suppressants using patients while its positivity in non gastric acid suppressants user was 2.72 %.

Conclusion: The prevalence of C. difficile in 600 hospitalized patients was found to be 5.17%.in our hospital. It was less as compare to other studied conducted earlier. Cause of less prevalence may be due to various factors like the decreased use of Clindamycin in our hospital. Secondly, antibiotics effective against C. difficile such as Metronidazole have been included as the first line drugs in suspected CDAD cases.

Colonization of C. difficile has been traditionally associated with hospitalization, advance age, underlying illness, gastric acid suppressant use and most prominently to use of antimicrobials. Uses of antibiotics, long stay in hospital and advance age was the most common risk factor in our study.

Keywords: colonization, Clostridium difficile & gastrointestinal.

Introduction:

Clostridium difficile is an anaerobic, gram-positive spore-forming bacillus. This bacterium has the potential to produce a spectrum of clinical illness, ranging from asymptomatic colonization to pseudomembranous colitis with severe diarrhea [1]

Asymptomatic C. difficile colonization is defined as a positive stool culture for C. difficile in the absence of diarrhea.[2]

Symptomatic Clostridium difficile infection (CDI) defined as The presence of diarrheal symptoms and either a stool test result positive for C. difficile toxins or detection of toxigenic C. difficile, or colonoscopic findings demonstrating pseudomembranous colitis .[2]

C. difficile is recognized as one of the most important pathogens in hospital and community healthcare settings, with a steadily rising global incidence of infection and concordant increase in mortality [3,4].

The first stage in asymptomatic C. difficile colonization is the ingestion of C. difficile spores. The spores survive the gastric acid and germinate into vegetative cells in the anaerobic environment of the colon.[5,6]

Material & Method

Place of Study in Department of Microbiology, Gajra Raja Medical College, Gwalior from Duration of Study: May 2015 to April 2016, Prospective, randomized study with Sample size: Study was conducted on 600 patients admitted in various wards in G.R. Medical College, Gwalior and associated J A Group of Hospital Gwalior (MP).

METHODS:

1. Stool Sample Collection

2. Alcohol shock treated sample was inoculated in RCM broth containing 0.01% Sodium Taurocholate.
3. Culture on non-selective as well as selective media
 - Selective agar medium- Cefoxitin Cycloserine Fructose Agar (CCFA)+ 0.1% sodium taurocholate(himedia)
 - Non selective media –Blood agar.
 - Incubate agar media in anaerobic environment by using anaerobic Gaspack system (Hi media) for 4-5 days at 37⁰ C
4. Colony was confirm by Gram's Staining and Biochemical test

Inclusion Criteria:

A. Inclusion criteria for colonization

1. Patients admitted in various wards of the J.A. group of hospital for more than 48 hours.
2. Patients were on an antibiotic either oral or parenteral.
3. Hospitalized patients with any G I complaint i.e. abdominal pain, diarrhoea, loose stool

Exclusion Criteria:

1. Patients who are admitted for less than 48 hours and who have no gastrointestinal symptom.
2. Patients who are not willing to participate in the study
3. Children less than 2 years of age.

Results

Table 1: Age and gender wise distribution of suspected patients

Age Category (years)	Gender		Total n (%)
	Male n (%)	Female n (%)	
2-18	60(16.9)	68(27.53)	128(21.33)
19 – 49	171(48.44)	116(46.96)	287(47.83)
50 – 64	64(18.13)	34(13.76)	98(16.33)
65 – 74	45(12.74)	22(8.90)	67(11.16)
>75	13(3.68)	07(2.83)	20(3.33)
Total	353	247	600

Among 600 suspected patients studied, maximum number, 287 (47.83%) belong to age group 19-49 years and minimum number 20 (3.33% belong to more than 75 years age group.

Male were more (58.83%) than female (41.16%) in studied suspected patients.

Table 2: Clinical Presentation of suspected patients

Symptom	n = 600 (%)
Fever	350 (58.33%)
Diarrhoea	118(19.67%)
Abdominal pain	200 (33.33)

Fever was the most prevalent presenting symptom with 350 (58.33%) suspected patients. This was followed by abdominal pain 200 (33.33%) patients and diarrhoea in 118 (19.67%) suspected patients.

Table 3: Relation between duration of hospital stay and *C. difficile* culture-positive patients

Duration of hospital stay days	Number of suspected Patient n	<i>C. difficile</i> culture-positive patients, n (%)
3-10	289	7 (2.42%)
11-18	193	11 5.699%)
19-26	86	8 (9.30%)
>26	32	5 (15.62%)
Total	600	31 (5.16%)

The least culture positivity was found in suspected patient who had admitted for 3-10 days (2.42 %). The maximum number of positive culture were found in patients with hospital stay more than 26 days which mean that duration of hospital stay correlate with positivity of culture.

Table 4: Comparison of gastric acid suppressant used and *C. difficile* positive patients

Gastric acid suppressant	<i>C. difficile</i> culture-positive	<i>C. difficile</i> culture-Negative
Used (490)	28 (5.71%)	462 (94.28%)
Not used (110)	03 (2.72%)	107 (97.27%)

C. difficile was isolated in 5.71 % of the gastric acid suppressants using patients while its positivity in non gastric acid suppressants user was 2.72 %.

Discussion

CDAD became prevalent in the 1960s and 1970s with the introduction of broad-spectrum antibiotics to clinical practice. Disruption of normal intestinal flora by antibiotics is a well-known risk factor for CDAD.[7]

C. difficile is considered as the most frequent etiological agent of nosocomial diarrhoea occurring in hospitalized patients, spreading easily through the environment, the hands of health care workers and subsequently to other patients, particularly in large hospitals.[8]

C. difficile has emerged as the most common cause of hospital acquired diarrhoea due to broad spectrum antimicrobial use.[9]

CDAD is the most common cause of hospital acquired diarrhea in developed countries, with an incidence of 0.1-2%.[10]

In our study stool sample was collected from 353 male and 247 female suspected patients and *C. difficile* was isolated from 20 male and 11 female. Isolation rate was 5.17 which was nearly similar to Patel P.V. et al, who investigated 176 male and 95 female stool samples and *C. difficile* was isolated from 10 males and 6 females, and isolation rate was 5.9% in duration of 6 months and they found one case of PMC.[11].

Conclusion

The prevalence of *C. difficile* in 600 hospitalized patients was found to be 5.17%.in our hospital. It was less as compare to other studied conducted earlier. Cause of less prevalence may be due to various factors like the decreased use of Clindamycin in our hospital. Secondly, antibiotics effective against *C. difficile* such as Metronidazole have been included as the first line drugs in suspected CDAD cases.

Colonization of *C. difficile* has been traditionally associated with hospitalization, advance age, underlying illness, gastric acid suppressant use and most prominently to use of antimicrobials. Uses of antibiotics, long stay in hospital and advance age was the most common risk factor in our study.

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