

Candida associated Acute Diarrhoea in Elderly

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Abstract

Background: Candida is a frequent isolation from stools in elderly patients with acute diarrhea in hospital settings. Diarrheogenic potential of candida is subject of study.

Method: Elderly patients of 60 years and above presenting at University Hospital, BHU with acute diarrhea of likely infectious origin were studied for enteropathogens along with their clinical profile and compared with elderly controls without diarrhea.

Results: 15 elderly patients with acute diarrhea (12.5%) had candida isolated from stools as compared to 3.5% in elderly controls without diarrhea and it was statistically significant ($p < 0.05$). History of use of broad spectrum antibiotics was present in 13%, 20% had associated diabetes mellitus and 13% had associated malignancy. There was paucity of abdominal or constitutional symptoms and absence of leucocytes or RBCs in stool.

Conclusion: Candida is a likely diarrheogen in elderly with acute diarrhoea with or without predisposing factors.

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Introduction

The rate of recovery and density of candida species from the GI tract of healthy individuals varies with the site sampled and with the age of subjects.¹

Candida is known to be pathogenic in GI tract of patients with depressed immunity. Gastrointestinal candidiasis has been recognized more commonly in recent years due to malnourishment, widespread use of antibiotics, chemotherapeutic agents, and prolonged survival of immunocompromized hosts. In these patients, candidiasis is usually invasive and causes candidemia.² Noninvasive intestinal overgrowth as a cause of diarrhea has been controversial though it has been reported in immunologically normal individuals.²⁻⁵ Candida has been implicated as a diarrhoeogen in elderly receiving antibiotics or with severe illnesses.^{6,7} Diarrhoea associated with candidal overgrowth in Indian elderly and its clinical correlates have been explored in this study.

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Material and Methods

Elderly patients of age 60 years and above with acute diarrhoea presenting at University Hospital, BHU, Varanasi or developing diarrhoea during hospital stay were studied for infectious enteropathogens. Acute diarrhoea was defined as more than 3 liquefied stools per day of less than 1 week duration. All patients with causes other than acute infection like drugs, food allergy, laxative abuse and history of immunosuppressive therapy were excluded. 120 such elderly patients with acute infectious diarrhea were selected for the study. 57 apparently healthy elderly (age 60 years or above) without any diarrhoea, 25 adults (age 15-59 years) and 25 children (age 0-14 years) with acute infectious diarrhoea were studied as controls.

Detailed clinical examination on a pretested proforma was carried out in all patients and controls regarding clinical features of diarrhoea. All the patients with diarrhoea and candidal overgrowth were treated with fluconazole.

Stool samples were collected from elderly, adults and children with acute infectious diarrhoea as well as

from healthy elderly control without diarrhoea in sterile vials. They were properly labelled and sent to laboratory within 2 hours of collection and processed immediately or kept in refrigerator at 4°C and processed on the same day. Stool samples were observed macroscopically for consistency, presence of mucus, blood or parasites.

A drop of stool specimen was mixed thoroughly with one drop of methylene blue on a microscopic slide. After placing cover slip, the slide was examined for presence of pus cells, erythrocytes and epithelial cells. Stool samples were examined for parasitic and bacterial enteropathogens as per standard techniques used.⁸

Stool samples were inoculated in duplicate into Sabouraud's dextrose agar with chloramphenicol 0.05gm/L and were incubated upto 7 days at 25-28°C. The cultures were examined after 48 to 72 hours for the medium sized, cream coloured, smooth and pasty colonies, indicative of candidal growth.^{9,10}

In this study, presence of mycelial or yeast form on microscopy together with heavy to confluent yeast like growth on culture, not associated with any known diarrhogens was considered positive for candida albicans. Further confirmation was done by study of morphology, microscopically for blastospores, chlamydo spores, pseudohyphae or hyphae.¹¹

Hb, TLC, DLC, and ESR were done using standard techniques. Other biochemical tests like B Sugar, B Urea, S Creatinine, S Sodium, S Potassium, S Albumin, S globulin and liver function tests were done using standard techniques.

Results

The male: female ratio of 120 elderly patients was 1.6:1 (73 males, 47 females). The mean age of male elderly patients was 67.2±5.1 years (60-86 yrs) and mean age for female elderly patients was 69.1±5.8 years (60-84 yrs). The mean age of elderly healthy controls without diarrhoea was 64.4±4.9 years (60-78 yrs) with M: F ratio 2.6:1. The mean age of 25 adult patients was 36.3±10.5 yrs (15-59yrs) with M: F ratio 1.5:1. The mean age of children patients was 8.0±3.7yrs (1-14 yrs).

Stool samples were positive for enteropathogen in 58 elderly patients (48%), 11 adult patients (44%) and 10 children patients (40%) as well as in 7 elderly

controls (12.3%). In elderly patients parasitic pathogens were commonest (18%), followed by bacterial (15%) and fungal (12%) pathogens.

Table 1 depicts the frequency of isolation of candida in elderly patients, elderly controls without diarrhea, adult and children with diarrhea. Out of 15 elderly patients with candida isolation, candida was sole pathogen in 13 cases (86.6%), in 1 patient it was associated with isolation of E.coli and in another patient there was presence of hookworm. Candida albicans was the sole organism in 12 cases (80%), Candida tropicalis in one case (6.6%) and both Candida albicans and Candida tropicalis were isolated in 2 cases (13.3%). The isolation of Candida albicans in elderly patients with diarrhoea as compared to healthy elderly controls without diarrhoea was statistically significant p < 0.05 (z test for significance).

In elderly with diarrhoea, the average loose stools per day were 5 (3-7) and average duration of loose stools was 4.5 days (1-6 days). Stools were yellow semifformed in 8 cases and yellow watery in 7 elderly patients. In all elderly patients (100%) stool showed less than 1 leucocyte per HPF and no RBCs. Only abdominal distension was complained in 3 patients (20%). No abdominal pain, vomiting, fever, altered sensorium or diminished urinary output was recorded. Only mild dehydration was observed in 10 patients (67%); haemoglobin was subnormal (Normal >13gm/dl in males and >12gm/dl in females) in 5 elderly patients (33%). S. albumin was <3.96 gm/dl in 4 elderly patients (20%) and below 2.7gm/dl in 1 elderly patient (6.0%).

Table 1: Isolation of candida from stool of different age groups of patients and healthy control.

Study Group Profile	Candida Isolation	
	Number	(%)
Elderly patients (120)	15	12.5
Elderly healthy controls (57)	2	3.5
Adult patients (25)	1	4.0
Children (25)	2	8.0

In elderly diarrhoea patients with candida isolation diabetes mellitus was present in 3 patients (20%), malignancy was present in 2 patients (13%). In two

such elderly patients (13%), there was history of use of antibiotic (cefadroxyl and amoxicillin respectively) in preceding one month.

All patients with diarrhea and candidial growth were treated with fluconazole and had a recovery within 48-72 hours.

Discussion

Candida is known to be pathogenic in GI tract of patients with depressed immunity (AIDS, cancer chemotherapy), but its role in diarrhoea is not widely accepted. More localized disease caused by Candida species, including oral candidiasis and hospital-acquired or antibiotic-associated diarrhea, also occurs in hospitalized patients.^{12,13} In a study antibiotics given to volunteers caused an increase in fecal yeast candida to $>10^5$ cfu/ml with development of diarrhoea in 50% which resolved after withdrawal of antibiotics.¹⁴

In this study, Candida albicans was the third common isolation (12.5%) from elderly patients with acute diarrhoea, amongst them it was sole pathogen in 87% and its isolation was statistically significant ($P < 0.05$) when compared to elderly healthy controls without diarrhoea. Etiological relationship of candida species with diarrhoea is usually established when yeast cells are present in large number in stool with or without pseudohyphae growth, as was seen in this study. These observations strongly support role of candida as diarrhoeogen.

Danna PL showed that fecal concentration of candida species $>10^5$ CFU/ml occurred in 30% of elderly inpatients with antibiotic associated diarrhoea not due to C difficile. Suppression of such intestinal overgrowth by specific antifungal agent nystatin in five cases resulted in resolution of diarrhoea despite continuation of antibiotic therapy. Moreover, there was bacterial suppression during candida overgrowth which reappeared after treatment of candida infection and resolution of diarrhoea thus supporting candida growth as etiological agent for diarrhoea.⁶

Candida albicans was commonly seen in children with diarrhoea, who have taken antibiotics for a length of time as well as in hospitalized elderly receiving antibiotics.^{7, 15}

History of use of broad spectrum antibiotic was

present in two elderly patients (13%) with acute diarrhoea with candida albicans isolation in our study. Diabetes mellitus (20%) and malignancy (13%) were other common predisposing factors in our study group. In the study by Gupta et al, diabetes mellitus was present in two patients (20%) and malignancy in three elderly patients (30%) with diarrhoea and candida isolation, only the patients of malignancy in his study were on chemotherapy. The paucity of abdominal or constitutional symptoms, mild dehydration and absence of fecal leucocyte or RBCs in stool are well characterised though Gupta et al reported significant volume depletion with prerenal azotemia. All the patients responded to fluconazole therapy within 72 hrs with reduction in volume and frequency of stools.⁷

In eight elderly patients in our study no predisposing factor was known. In only one patient, hypoalbuminaemia with serum albumin below 2.7 gm/dl was present; diarrhea is known to be associated with severe hypoalbuminaemia (<2.5 gm/dl) in intensive care setting.

The role of candida species in otherwise normal adults and children with diarrhoea has been recognized.^{2, 4, 6} Thus, candida is likely to be the cause of acute diarrhoea in these elderly patients with or without predisposing factors.

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