YEASTS AND YEAST LIKE FUNGI AS CAUSATIVE AGENTS IN DIARRHEA

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SUMMARY: Diarrheic stool samples of 195 patients, suffering from diarrhea without any indication of pathogenic bacteria or/and parasites, were studied for presence of yeast and yeast like fungi in a period of one year. Fungi grown on Sabouraud media were typed, classified and species were identified using conventional methods. Distribution of 106 yeasts isolated were as follows; Candida albicans 74 (69.9%), Candida tropicallis 20 (18.9%), Geotricum candidum 3(2.8%), Candida stellatoidea 2 (1.9%), Candida parapsilosis 2 (1.9%), Candida guillermondii 2 (1.9%), Candida krusei 2 (1.9%) and Candida pseudotropicalis 1 (0.9%). In the history of the 30 out of 38 (78.9%) patients who given therapy, there were antibiotic treatment during start of diarrhea. Mean age of the patients were 13.3 years 50 percent of the patients were under 8 years. Our results show that; intestinal candidiasis must be held in mind as a cause of diarrhea due to antibiotic regimen, it's frequency was higher in childhood and Candida albicans is the most agent.

Key Words: Yeast, cause of diarrhea.

INTRODUCTION

Candida species are found at the normal flora of skin, mouth, intestine and mucocutenous junctions (1).

Candida species can infect virtaully all organ systems, leading to an extensive array of clinical manifestations. Fungi diarrhea is associated with broad spectrum antibiotics or alteration of the patients immune status due to corticosteroids, immunosuppressive drugs and cancer chemotherapy (2,3).

Candida albicans is the most common cause of candidiasis, but C. tropicallis, C. parapsilosis, C. guillermondii, C. krusoi and a few other species pathogenic for humans, particularly in the mouth, stool and vagina. From one to multiple small shallow ulcerations due to candida may appear in the esophagus or gstrointestianal tract (4).

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MATERIALS AND METHODS

All the stool samples which are obtained at the microbiological laboratory from November 1987 to November 1988 were inoculated to Sabouraud, EMB, SS, Selenit F and Campylobacter media. Direct microscopic examination was used studying the parasites. In this study; samples in which the causative agents of diarrhea could not be isolated by both direct microscopic examination and routine bacteriological analysis but fungi grown on Sabouraud media were investigated. These yeasts like colonies were inoculated to corn meal agar. After incubation for three days at 37°C, fungi were typed according to the morphological appearance under the microscope. Glucose, maltose, lactose, galactose and sacchrose fermentation and assimilation test were carried out to confirm the typing. Liquid beef extract media and carbohydrate solution to be tested contained in Durham tubes with screw type closures were used. Inoculated tubes were incubated at room temperature for 14 days and controlled every three days. The yellow colour change (acid) was considered as assimilation positive reaction and gas formation as fermentation positive reaction.

38 out of 107 patients located in their recorded addresses were treated with diet, B complex vitamins and enzyme supplements. The patients who did not respond the therapy were treated with nystatin for 20 days. The patients who were resistant to both therapies were continued to be treated with nystatin for further 10 days. The patients were re-examined 3 months later and they had no complaints of diarrhea.

RESULTS

Yeast and yeasts like fungi were isolated in the 106 out of the 196 stool samples which did not have pathogen bacteria and parasites. Fungi isolated patients were consisted of 46 males (43.0%) and 61 females (57.0%). Mean age distribution of patients was 13.3 years. 50 percent of the patients were under 9 years old. Age distribution of the patients was shown at Table 1. 30 out of 38 patients (78.9%) who had treatment were found to have diarrhea due to antibiotic therapy in the history of the patients. Two patients had perianol candidiasis.

Table 1: Age distribution of the patients.

Age groups	0-5	6-10	11-15	16-20	21-30	31-40	41-50	51-60	61-70	Total
Number	42	23	15	8	4	3	7	3	1	106
Percent	39.6	21.7	14.2	7.6	3.8	2.8	6.6	2.8	0.9	100

Distribution of 106 fungi isolated were as follows; Candida albicans 74 (69.9%), Candida tropicalis 20 (18.9%), Giotricum candidum 3 (2.8%), Candida stellatoidea 2 (1.9%), Candida parapsilosis 2(1,9%), Candida guillermondi 2(1.9%), Candida krusei 2(1.9%) and Candida pseudotropicalis 1 (0.9%) (Table 2).

21 out of 38 patients (55.3%) were cured by diet, B complex vitamins and enzyme supplements. 14 out of 17 patients who were resistant to this therapy have been recovered by nystatin given for 20 days. The remaining three patients were also recovered by nystatin given for an additional 10 days (Table 3).

DISCUSSION

Candida species were reported to be responsible agent for diarrhea (5).

Yeast and yeast like organisms can be identified according to their morphological appearance on corn meal agar, carbonhydrate assimilation and fermentation tests. Furthermore, the investigation molecular structure of DNA, potassium nitrate assimilation tests and commercial rapid identifiction systems can be used for the identification (6-10). In this study, the morphological appearance on the corn meal agar, carbohydrate assimilation and fermentation tests were used for identification.

Pincus *et al.* (8) reported a study of which did not have the origin of isolation in 29 candida; 15 out of them were candida albicans, 6 were Candida tropicalis, 3 were Candida guillermondii, 3 were Candida krusei, 1 was Candida parapsilosis, 1 was Candida pseudotropicalis. Scherer and Stevens (10) reported a study of which did not have the origin of isolation in 36 Candida; 17 out of them were Candida albicans, 10 were Candida tropicalis, 7 were Candida parapsilosis, 1 was Candida krusei and 1 was Candida pseudotropicalis.

The most commonly used drugs, frequent nystatin and amphotericin B, have been effective in treatment of intestinal candidiasis (11).

Table 2: Distribution of fungi isolated.

Species	Candida albicans	Candida tropicalis	Geotricum candidum	Candida stellatoidea	Candida parapsilosis	Candida guillermondii	Candida krusei	Candida pseudotropicalis	Total
Number	74	20	3	2	2	2	2	1	106
Percent	69.9	18.9	2.9	1.9	1.9	1.9	1.9	0.9	100

Table 3: Results of the treatments.

Therapy	Diet+B complex vitamines+ Enzyme supplements			Nystation for 20 days			Nystation for additional 10 days		
	Number	Cured	Not Cured	Number	Cured	Not Cured	Number	Cured	Not Cured
Number	38	21	17	17	14	3	3	3	-
Percent	100	55.3	44.7	100	82.3	17.7	100	100	-

Candidiasis can occur due to change of normal intestinal flora which derange from various reasons (4,11). In order to improve the normal intestinal flora, diet therapy, B complex supplements and enzyme supplements were used in this study. 21 out of 38 patients (55.3%) cured with this therapy. Nystatin was used for the patients who did not cured with this therapy.

As a result we conclude that; intestinal candidiasis must be held in mind as a cause of diarrhea due to antibiotic regimen, its frequency was high in childhood and candida albicans is the most agent.

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