

RISK FACTORS FOR ACUTE AND RECURRENT VAGINAL CANDIDIASIS IN SINGAPORE

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SYNOPSIS

In a study of the risk factors for acute and recurrent vaginal candidiasis in Singapore, it was found that in both groups the majority of the patients were in the 20—39 year age group with a predilection for Chinese. Of the 19 patients with recurrent vaginal candidiasis, 3 (15.8%) had anaemia, 2 (10.5%) had iron deficiency without anaemia while 3 (15.8%) patients had high random blood sugar without clinical diabetes mellitus.

In contrast, of the 28 patients with acute vaginal candidiasis, only one had anaemia and another high random blood sugar. Blood sugar, haemoglobin and serum iron estimations should therefore be done in patients with candidiasis particularly in the recurrent group.

INTRODUCTION

Vaginal candidiasis is a common problem in sexually transmitted diseases clinics (1, 2, 3). In our hospital, which is the main hospital for skin and sexually transmitted diseases in Singapore, vaginal candidiasis accounted for 2.5% of all the sexually transmitted diseases in 1984 (4).

The majority of the patients have relatively minor, easily curable disease. However, there is a small group of patients who are prone to chronicity and/or recurrent attacks. Known predisposing factors include antibiotic therapy, immunosuppression, pregnancy (5), diabetes mellitus, wearing of nylon tights (6), oral contraceptive pills (7), iron deficiency anaemia (8), various endocrinopathies (9), intestinal carriers (10) and deficiencies of T-lymphocyte and/or phagocyte function (11), although in many cases, none of these factors can be identified.

Although the epidemiology of candidiasis has been studied (12), it would be important to identify the possible aetiological factors in recurrent candidiasis as a guide to management.

Chronic or recurrent vaginal candidiasis was arbitrarily defined as either:-

- (a) three clinical exacerbations within the last 6 months; or
- (b) previous disease history of longer than one year.

In both cases, at least one of the attacks was proven by culture to be solely due to *Candida albicans* and to another organism.

Acute vaginal candidiasis was defined as vaginal candidiasis which was recent in onset and which did not have the features of chronic recurrent vaginal candidiasis.

PATIENTS AND METHODS

During the period from July 1984 to December 1984, 28 patients with acute vaginal candidiasis and 19 patients with chronic recurrent vaginal candidiasis confirmed by culture were recruited into the study. All patients had symptoms and/or signs of vaginitis and all were seen in the sexually transmitted disease clinic in Middle Road Hospital. Patients were asked about personal and family history of diabetes and other endocrine anomalies, pregnancy, administration of antibiotics, corticosteroids and immunosuppressives, and history of atopy. A full clinical examination of the patients was done. Patients with chronic paronychia and/or associated sexually transmitted diseases were excluded from the study.

Investigations included smears and cultures for gonococci, *Trichomonas vaginalis* and *Candida albicans*. The smears for *Candida albicans* were stained by Gram's method and examined microscopically for yeast cells. The swabs were cultured at 38°C for 48 hours in Trichosel medium. (From Becton Dickinson & Company, BBL, USA). Trichosel medium has been found to be as good as Sabouraud's medium for the culture of candidal organisms (13). Blood investigations included haemoglobin, iron, total iron-binding capacity, calcium, random sugar, total white cell count and differential count. Anaemia is defined as one with a haemoglobin concentration below 11 gm%. A random blood sugar above 102 mg/dl is considered abnormal.

RESULTS

Table 1 shows the age and ethnic distribution of

acute and chronic vaginal candidiasis. In both groups, the majority of the cases belonged to the early reproductive age group of between 20—39 years old. Chinese constituted 79% of acute candidiasis cases; 89% of chronic candidiasis cases and 83% of all cases (acute and chronic).

The frequency of the predisposing factors is shown in Table 2. 10 out of the 19 patients with chronic recurrent vaginal candidiasis had no apparent predisposing causes, 3 had high blood sugar levels without clinical diabetes mellitus, 3 had anaemia while 2 had low serum iron without anaemia. Of the 28 patients with acute vaginal candidiasis, only one each had anaemia and high random blood sugar respectively. In both groups, there was no patient with hypocalcaemia. Pregnancy, oral contraceptive pills, frank diabetes mellitus do not seem to be important risk factors in this study. We did not attempt to identify patients who were possible intestinal carriers of candidiasis. An identical odds ratio and p value were found for anaemia in chronic candidiasis patients versus acute cases.

TABLE 2: PREDISPOSING FACTORS IN PATIENTS WITH ACUTE AND CHRONIC VAGINAL CANDIDIASIS

Predisposing factors	Acute	Chronic
Personal History of diabetes	0	0
Family history of diabetes	0	1
Anaemia (Hb < 11 gm/dl)	1	3
Low iron without anaemia	0	2
High random blood sugar without history of Diabetes	1	3
Hypocalcaemia	0	0
Pregnancy	0	0
Oral contraceptive pills	0	0
No predisposing factors	26	10
Total:	28	19

DISCUSSION

Among acute candidiasis patients, 79% were Chinese. By contrast Chinese patients constituted

TABLE 1: AGE AND RACE DISTRIBUTION IN ACUTE AND CHRONIC VAGINAL CANDIDIASIS

Age	Chinese		Malays		Indians	
	Acute	Chronic	Acute	Chronic	Acute	Chronic
< 20 years	2	3	0	0	0	0
20—29 years	12	4	1	0	1	0
30—39 years	5	5	2	1	2	1
40—49	3	2	0	0	0	0
> 49 years	0	3	0	0	0	0
Total:	22	17	3	1	3	1

89% of chronic candidiasis cases. Although the number of patients was small, Chinese do seem to be more prone than the Malays and the Indians to chronic recurrent vaginal candidiasis as the racial distribution of Singapore consists of 75% Chinese, 15% Malays, 7% Indians and 3% others. The reasons for the Chinese predominance are unknown. The lower frequency in the Malays may be related to the routine washing of the genitalia after micturition. The reason for the low occurrence in Indians is also unknown.

Ten out of 19 patients (52.6%) with chronic recurrent vaginal candidiasis while 26 out of 28 (92.8%) patients with acute vaginal candidiasis had no apparent predisposing factors. This is consistent with findings elsewhere (14).

Diabetes mellitus is a well known predisposing factor for vaginal candidiasis even though the reported incidence among candidiasis patients varies greatly (15, 12). Vaginal candidiasis may sometimes be the first manifestation of diabetes mellitus (15) as is shown by 4 of our patients. Three out of the 19 patients (15.8%) with chronic recurrent vaginal candidiasis had a raised blood sugar level ranging from 249 mg/dl to 290 mg/dl (Normal \leq 120 mg/dl) without any frank symptoms of diabetes mellitus. In contrast, only one out of the 28 patients (3.6%) with acute candidiasis had a raised blood sugar level of 249 mg/dl. Asymptomatic diabetes mellitus seemed to play a greater role in chronic recurrent as opposed to acute vaginal candidiasis. In diabetes, there is increased glycogen stores in the epithelial cells. There is also free glucose in the vaginal secretions. In addition, the polymorphonuclear leucocytes from patients with diabetes have a slightly decreased ability to phagocytose candida blastospores (17).

Iron deficiency anaemia has been associated with chronic mucocutaneous candidiasis but has not been linked to vaginal candidiasis (8). Iron deficiency alone has not been reported to be a predisposing factor for vaginal candidiasis. In our study, 3 out of 19 patients (15.8%) with chronic recurrent vaginal candidiasis had anaemia ranging from 10.3 gm% to 10.8 gm% (Normal \geq 11 gm%). On the other hand, only one out of 28 patients (3.6%) with acute vaginal candidiasis had anaemia of 9.6 gm%. The prevalence of anaemia in dermatological patients attending our Hospital is 4% (18). Patients with chronic recurrent vaginal candidiasis therefore seem to have a higher prevalence of anaemia as compared with the normals and patients with acute vaginal candidiasis. All the 4 patients who had anaemia had normal serum iron and total iron-binding capacity.

Two out of 19 patients (10.5%) with chronic recurrent vaginal candidiasis had iron deficiency alone without anaemia. In one it was 45 ug/dl while the other 60 ug/dl, the normal values being 80 ug/dl to 160 ug/dl. In contrast, none of the 28 patients with acute vaginal candidiasis had iron deficiency alone.

Anaemia and iron deficiency seem to play a greater role in chronic recurrent vaginal candidiasis than in acute vaginal candidiasis. It is postulated that anaemia leads to reduced tissue oxygenation with a consequent increased acidity in the vaginal mucosa that favours the growth of candidal organisms. The way iron deficiency alone predisposes patients to vaginal candidiasis is unknown. The findings in our study show the importance of doing a routine haemoglobin and serum iron level in patients with chronic recurrent vaginal candidiasis.

Ten out of 19 recurrent candidal patients studied had no apparent predisposing cause. This suggests an idiopathic group exists where intrinsic immunological defect may exist. Further work needs to be done in this area.

In conclusion, even though the study population is small, this study does show that there is a difference ($p < 0.15$) in the incidence of anaemia and high random blood sugar levels between the acute and chronic recurrent vaginal candidiasis. There is also a difference ($p < 0.15$) in the incidence of anaemia between patients with chronic vaginal candidiasis and the dermatological patients in general. The study therefore demonstrates an important aspect of the management of chronic recurrent vaginal candidiasis: even though patients do not have any obvious clinical features of diabetes mellitus or anaemia, it is important to do a random blood sugar, a haemoglobin level and a serum iron level.

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