

# VAGINAL CANDIDIASIS IN A SEXUALLY TRANSMITTED DISEASE CLINIC

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## SYNOPSIS

Vaginal candidiasis is a common condition seen in Sexually Transmitted Disease Clinics. We present here the prevalence of various predisposing factors which we encountered in patients with vaginal candidiasis. Anaemia, not previously reported as a predisposing factor, was present in 30% of our patients. Ten per cent of our patients had positive VDRL and another 10% had history of other sexually transmitted diseases. Pruritus vulvae is the commonest presentation but vulvitis is seen in half only.

## INTRODUCTION

Infection by the *Candida* genus is almost worldwide and *Candida albicans* has been described as the commonest infectious agent isolated from the female patients attending clinics for the diagnosis of Sexually Transmitted Diseases (STD). This underlines the importance of this condition to physicians concerned with the management of such patients. At the Middle Road Hospital, 87 and 114 female patients with vaginal candidiasis were seen in 1981 and 1982 respectively. However, this figure is probably under-represented as most cases of monilial vaginitis are seen by the private practitioners and gynaecologists. In most clinical reports the prevalence of candidiasis in the various predisposing conditions were mentioned. However, there is a scarcity of studies on the prevalence of various predisposing conditions in patients with vaginal candidiasis. In this study the prevalence of various known predisposing factors in patients with vaginal candidiasis and the presenting symptoms and signs are studied.

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They found the chances of a patient having vaginal candidiasis were significantly less among those using a sequential regimen than those using a combination regimen.

Only about 5% and 11% of our patients with vaginal candidiasis were diabetic or had a family history of diabetes respectively. This is a lower than expected figure. Similarly, the lower than expected incidence of diabetes in patients with vaginal candidiasis is reported by others (10). This is not to say however, that diabetes mellitus is not a potent predisposing factor, since a high percentage of diabetic patients will have obstinate candidiasis. The reason is related to the increased concentration of glucose in the tissues, blood and urine.

The use of antibiotics is clearly related to the prevalence and severity of candidal infections (3). Several theories have been advanced to explain this (15, 16). Some workers believe that the organisms multiply more rapidly because of reduction in bacterial competition or that the antibiotics alter the host immunological mechanisms. In our study, 12% of our patients had a history of recent oral antibiotics ingestion for various reasons confirming the role of oral antibiotics as a predisposing factor. Loh and Baker (17) reported an increase of 100 to 1000 times in the intestinal population of *Candida* in patients who were taking chlor-tetracycline and oxytetracycline. Such heavily colonized sites most surely serve as sources of infection and reinfection, thus favouring perpetuation of the vaginal disease in susceptible patients.

Systemic steroid has been known to be a predisposing factor to candidiasis (18). However, in our study none of the patients were found to be on any systemic steroids.

Diet has been incriminated as a predisposing factor in vaginal candidiasis. There is some evidence that heavier candidal colonization of the intestinal tract is seen in people who consume large amounts of fruits or sugar (10). However, there has never been mentioned the association of anaemia with vaginal candidiasis. In our study we found that a high percentage (30.4%) of patients had anaemia with haemoglobin of less than 11 gram/dl. Their haemoglobin varied from 6.6 to 10.8 gram/dl. This may be an important predisposing factor to vaginal candidiasis. We have not investigated the type of anaemia associated here. The mechanism remains to be elucidated. This could be due to the reduced tissue oxygenation due to anaemia leading to increased tissue acidity and hence a lowered pH in the vaginal mucosa which in turn favours the growth of the candida.

Waisman (19) pointed out that the candidal infection of the male sexual partner was frequently undiagnosed and Rohatiner (20) observed that 6 out of the 28 male consorts of female patients with genital candidiasis were infected with candida organism. Spitzbart (21) noted that 18.5% of female patients with candidiasis were initially treatment failures. Only when the husband was also treated did the symptoms subside. There are similar reports by others (2, 23). In our study we found that 16% of the sexual partners of our patients were symptomatic with symptoms varying from genital irritation to erythema. They were however not studied for candidiasis. These consorts form an important reservoir of reinfection in the patients

and may be responsible for recurrent infections and recalcitrant candidal infections in females. In addition we found that 10.7% of patients had recent Trichomoniasis and another 10.7% had positive VDRL. Two patients had concurrent *N* gonorrhoeae cultured. This has important implication as most cases of vaginal candidiasis may not have been screened for other STD. One must always bear in mind that vaginal candidiasis can be a sexually transmitted disease and that other STD has to be excluded as well when encountered with such patients. Our figures may be biased towards a group of patients attending a STD Clinic and the incidence of associated STD may not be as high in patients attending the non STD Clinics but this factor has to be kept in mind.

A high percentage (32.1%) of our patients gave a history of past vaginal candidiasis over the past one year and this factor calls for thorough investigation to elucidate predisposing factors. There have been several studies to incriminate rectal infections as the cause of the source of reinfections. De Souza and van Uden (8) found that in 55 women whose vaginal cultures were positive for candida species, 75% harboured the organism in the faeces while only 25% of normal females had positive faecal culture. Rohatiner (20) noted that 48% of patients with vaginal candidiasis had positive rectal cultures. These observations indicate the importance of the rectum as a potential source of infection. We have not made any rectal culture study in our patients.

We also noticed in our study that the majority of the cases (91%) had vaginal secretions that were acidic and this may have further supports for the fact that acidic pH favours candida growth and this point may have to be considered when instituting therapy.

Signs and symptoms in vaginal candidiasis have diagnostic significance and history and examination are therefore important in patients suspected to have the infection. In our study, pruritus vulvae is the commonest presentation. This is the cardinal symptom of candidiasis in female. It varies in degree from patient but it can be slight to intolerable preventing the patient from resting or working. The intensity of pruritus and the degree of vulvar erythema have been described to be closely related (10). The incidence of pruritus has been reported to approximate 90% of the cases (10). This symptom is present in 70% of our patients. However only about half the number showed evidence of vulvitis as compared to that of Gardner and Kaufman (10) who found that pruritus is seldom reported by patients who have no visible vulval changes. Vaginal discharge is the next commonest symptom in our patients although leukorrhoea is not considered a classical symptom of candidiasis in some reports and found by some to be rarely the presenting complaints (10).

The next commonest symptoms encountered in our patients were that of dyspareunia and dysuria. This has been reported (10, 23). Gardner and Kaufman (10) noted that burning sensation is a common complaint, more marked after micturition and may be related to the urine coming in contact with the inflamed vulvae. The term vulvular dysuria has been coined by them. Patients and clinicians may interpret this symp-

## MATERIALS AND METHODS

Non prostitute females who visited the Middle Road Hospital Outpatient Clinic with genito-urinary complaints between the period 1.7.80 and 31.12.80 were interviewed and particulars about their age, methods of contraception, pregnancy, past history of vaginal candidiasis (last 1 year), and history of drug ingestion, in particular antibiotics, over the last 3 months, were taken. A history of STD over the last 1 year was also recorded. In addition they were asked about history of diabetes mellitus and their family history of diabetes mellitus. Their genito-urinary symptoms were recorded and examinations of the genital organs were made.

Vaginal smears for Gram-stain for yeast cells and mycelium and a culture on Sabouraud media was made for each patient. Candidiasis was diagnosed when Gram positive pseudomycelial threads and yeast-like form were demonstrated on a stained slide and when typical colonies were grown on Sabouraud media. Simultaneous cultures for *Trichomonas* in Whittington media and *N gonorrhoeae* in Modified Thayer Martin media were made. Only patients with culture confirmed vaginal candidiasis were included in the study. A total of 56 patients were selected in this way.

## RESULTS

Table 1 shows the age and race distribution of the patients seen. The majority of cases belong to the early reproductive age group of between 20 to 39 years old and Chinese patients constituted the majority. The Malays and Indians had similar number of patients.

Table 2 shows the predisposing factors known to be associated with vaginal candidiasis. A high proportion of the patients had haemoglobin of less than 11 gram/dl. Twenty-one percent was pregnant, the period of gestation being 3 months to 6 months. Twelve percent gave a history of recent antibiotics ingestion and 5% had diabetes mellitus and 10% had positive family history of diabetes mellitus.

Table 3 shows that 32% had history of previous vaginal candidiasis and 10% had recent associated *Trichomonas* infections and the same number had a positive serology for syphilis (VDRL). Sixteen percent of their sexual partners were symptomatic. An acidic vaginal secretion was recorded in the majority of cases (91%).

Table 4 shows that the main symptoms were pruritus vulvae and vaginal discharge. Most patients had a moderate to copious whitish discharge. Vulvitis was a common sign.

## DISCUSSION

*Candida albicans* is the commonest infectious agent isolated from the non prostitutes female patients attending the STD Clinic at the Middle Road Hospital. This agent was reported to be the commonest agent isolated in female patients attending STD Clinic in other parts of the world (1, 2).

The *Candida* genus can be sexually transmitted and this was reported as long ago as 1920 by Sigman and was corroborated by Odland and Hoffstaedt in 1929 (4).

*Candida* genus are actual or potential pathogens in the genital tract and many studies of their distribution in various population groups have been made. These studies usually give conflicting reports (5). Usually they are commensals, becoming pathogenic when favourable environmental conditions develop in the host. Although reports differ widely, it is probable that less than 50% of patients who harbour *Candida* in the vagina have clinical disease (10). *Candida albicans* is the type that most often causes infection. We present here the prevalence of the various predisposing factors seen in patients with vaginal candidiasis, their common presentations and compare them with those found in other studies.

The majority of our cases belonged to the reproductive age group between 20 to 39 years of age. Majority of the cases are Chinese. However, when one takes into consideration the racial population distribution of Singapore which consists of 75% Chinese, 15% Malay, 7% Indians and 3% others, it appeared that the Indians and to a lesser extent the Chinese are more predisposed to have vaginal candidiasis compared to the Malays. It is known that the Malays in Singapore tend to utilise the Hospital less frequently and therefore giving a unrepresented distribution.

Conditions which favour the transition of *Candida* saprophyte to a pathogen and relevant to vaginal candidiasis include pregnancy, diabetes, and possibly also the oral contraceptive and oral antibiotics. Numerous cases in our study were associated with these factors.

Pregnancy is an undisputed factor in its pathogenicity (3, 6, 7). The incidence and severity of the infection increases with the duration of gestation (7, 8). In our study, 21% of our patients with vaginal candidiasis were pregnant.

The high hormone levels in pregnancy lead to a pronounced increase in the glycogen content of the vagina which constitutes a favourable environment for the growth of candidal organisms. In addition, during pregnancy there is a reduction of T-cell activity (which help to protect the fetus from rejection) and there are changes in the carbohydrate metabolism which may favour the growth of *Candida* (9, 11). After delivery the precipitous drop of estrogen and progesterone levels is followed by radical changes in vaginal metabolism, chemistry and cytology and in most patients by the rapid disappearance of the clinical signs of candidiasis. Negative cultures are usually obtained within a few days, since the new vaginal environment is extremely unfavourable if not hostile to the growth of the species of *Candida*. While many believe that *Candida* frequently behaves as a commensal in these conditions, Beare et al (12) and Carroll et al (7) feel that the isolation of *Candida* species from the vagina of pregnant women indicates a need for specific antifungal therapy.

About 11% of our cases were on the contraceptive pills. Several studies have shown that cyclic hormones for contraception is a predisposing factor to vaginal candidiasis (2, 3, 13). In one study of 121 non pregnant patients with candidiasis, 51% were taking oral contraceptives (10). This figure is higher than that found in our study. Jackson and Spain (14) felt that the type of oral contraceptive being used was significant.

tom as being due to cystitis.

Vaginal discharge was present in all our patients on examination but the classical plaque lesions described to be commonly seen during pregnancy (24) was not seen in any of our patients. Such plaque lesions are reported in only 20% of non pregnant patients (2, 25). A moderate amount of whitish discharge was most commonly encountered in our patients. Cervicitis was present in 21% of our cases.

**CONCLUSION**

It can be concluded in our study that vaginal candidiasis is one of the commonest vaginal infection amongst the non prostitute females attending the STD clinic. One should always remember that vaginal candidiasis can be sexually transmitted and other associated STD have to be excluded. It is important to treat affected partners and correct predisposing factors including possibly anaemia to prevent recurrence.

**TABLE 1  
AGE AND RACE DISTRIBUTION IN 56 PATIENTS  
WITH VAGINAL CANDIDIASIS**

Age	Chinese	Malays	Indians
< 20 yrs	6	0	0
20 - 29	25	4	4
30 - 39	10	1	1
40 - 49	3	1	0
> 49	1	0	0
Total	45 (80.3%)	6 (10.7%)	5 (9.0%)

**TABLE 2  
PREDISPOSING FACTORS IN 56 PATIENTS  
WITH VAGINAL CANDIDIASIS**

Predisposing Factors	No.
History of Antibiotics	7 (12.5%)
Pregnancy	12 (21.4%)
Diabetes Mellitus	3 (5.3%)
F/H Diabetes Mellitus	6 (10.7%)
Anaemia (<11 gm/dl)	17 (30.4%)
Oral Contraceptives	6 (10.7%)

**TABLE 3  
ASSOCIATED FINDINGS IN 56 PATIENTS  
WITH VAGINAL CANDIDIASIS**

Findings	Number
P/H Moniliasis	18 (32.1%)
P/H T. Vaginalis	6 (10.7%)
Positive VDRL	6 (10.7%)
Spouse Symptomatic	9 (16.1%)
Secretion pH	Acidic 51(91.1%)
	Alkaline 5 (8.9%)

**TABLE 4  
SYMPTOMS & SIGNS OF 56 PATIENTS  
WITH VAGINAL CANDIDIASIS**

<b>Symptoms</b>			
Vulval Itch			44 (78.6%)
Vaginal Discharge			43 (76.8%)
Dyspareunia			11 (19.6%)
Dysuria			8 (14.3%)
<b>Signs</b>			
Vulvitis			26 (46.4%)
Vaginitis			9 (16.1%)
Cervicitis			12 (21.4%)
Discharge	White	Scanty	7
		Moderate	31
		Copious	5
	Yellow	Scanty	1
		Moderate	9
		Copious	2
	Green	Moderate	1

**REFERENCES**

- Catterall R D: Influence of Gestogenic Contraceptive Pills on Vaginal Candidiasis. *Brit J Vener Dis* 1971; 47: 45-7.
- Oriel J D, Partridge B M, Denny M J & Coleman J C: Genital yeast infections. *Brit Med J* 1972; iv: 761-4.
- Willmott F E: Genital yeast infection in female patient attending a VD Clinic. *Brit J Vener Dis* 1975; 51: 119-22.
- Odland H & Hoffstaedt R E: Eruption of Genitalia due to a fungus. *Arch Derm Syph* 1929; 20: 335-8.
- Harris J R W: In *Recent Advances in Sexually Transmitted Diseases*. Morton R S & Harris J R W Ed.: 1975; p 232. Churchill Livingstone, London.
- Pedersen G T: Yeast flora in Mother and Child. *Dan Med Bull* 1969; 16: 207-20.
- Carrol C J, Hurley R & Stanley V C: Criteria for diagnosis of Candida Vulvovaginitis in pregnant women. *J Obstet Gynec Brit Comm* 1973; 80: 258-63.
- de Sousa H M & van Uden N: The mode of infection and reinfection in yeast vulvovaginitis. *Amer J Obstet Gynec* 1960; 80: 1096-100.
- Finn R, St Hill C A, Govan A J, Ralf I G, Gurnay F J, Denye V: Immunological responses in pregnancy and survival of fetal homograft. *Brit Med J* 1972; 3: 150-2.
- Gardner H L and Kaufman R H: In "Benign Diseases of the Vulva and Vagina". 1969: 1st ed. 149-67. Mosby, St Louis.
- Lind J and Harris V G: Changes in the Oval glucose tolerance test during the peurpereum. *Brit J Obstet Gynec* 1976; 83: 460-3.
- Beare J M, Gentles J C & Mackenzie W R: *Textbook of Dermatology* 1968; 1st ed: Blackwell, Oxford and Edinburgh.
- Walsh H, Hildebrant R J & Prystowsky H: Candidal Vaginitis associated with use of oral progestational agents. *Amer J Obstet Gynec* 1965: 93: 904.
- Jackson J L and Spain W T: A comparative study of combined and sequential Anovulatory therapy on vaginal moniliasis. *Amer J Obstet Gynec* 1968; 40: 1134-5.
- Seelig M S: The role of Antibiotics in pathogenesis of candida infection. *Amer J Med* 1966; 40: 887-917.
- Seelig M S: Mechanism by which antibiotics increases the incidence and severity of candidiasis and alter the immunological defences. *Bact Rev* 1966; 30: 442.
- Loh W P & Baker E E: Fecal flora of man after oral administration of chlortetracycline or oxytetracycline. *Arch Int Med* 1955; 95: 74-82.
- Wenrier H I & Hurley R: *Candida Albican*: 1964; p 74, 135. Churchill, London.
- Waisman M: Genital moniliasis as a conjugal infection. *Arch Derm Syph* 1954: 70: 718-22.
- Rohatiner J J: Relationship of candida albicans to the genital and anorectal tracts. *Brit J Vener Dis* 1966; 42: 197-200.
- Spitzbart H: *Mykosen*: 1968: II: 617.
- Diddle A W, Gardner W H, Williamson P S & O'Connor K A: Oral contraceptive medications and vulvovaginal candidiasis. 1969; *Obstet Gynaec*. 34: 373-7.
- Barr W: *Clinical Gynaecology*. 1971; 1st ed. p 59. Churchill Livingstone, Edinburgh & London.
- Dewhurst C J: *Integrated Obstetrics and Gynaecology for Post Graduate*. 1972; 1st ed. p 580. Blackwell, Oxford & London.
- Nicol C S: Other Sexually Transmitted Diseases II *Brit Med J* 1971; ii: 507-9.