The prevalence and clinical diagnosis of vaginal candidosis in non-pregnant patients with vaginal discharge and pruritus vulvae

H. J. WRIGHT, FRCS, FRCGP
Head of Division of General Practice, Department of Community Medicine and General Practice, University of Leeds

A. PALMER, MRCOG
Consultant Gynaecologist, Hull Royal Infirmary

SUMMARY. Two hundred and thirteen non-pregnant female patients complaining of vaginal discharge or pruritus vulvae were recruited to the study by 45 general practitioners in the Yorkshire region. Of these patients, 102 (48 per cent) were found to have demonstrable vaginal mycosis on an initial swab and a further 10 to be swab positive after one week of placebo treatment. The total prevalence in this population of women consulting their practitioner was thus 52.6 per cent.

Analysis of symptomatology and of physical findings showed that a clinical diagnosis of vaginal mycosis cannot be made with acceptable reliability.

The occurrence of spontaneous swab conversion is noted, and its possible origins are discussed.

Introduction

VAGINAL discharge and pruritus vulvae are symptoms which patients often present to their general practitioner. Clinical assessment is often difficult; and treatment is often unrewarding. Moreover, because of the discomfort which such symptoms engender, the doctor is often under pressure to provide effective initial treatment before he has access to laboratory results.

Numerous hospital-based studies over the past decade have suggested that these symptoms are commonly associated with vaginal candidosis, and indeed that the prevalence of the latter has increased. Few symptom-based studies, however, have been undertaken from general practice.

Throughout this report the term 'candidosis' will be used as synonymous with 'mycosis', and in preference to 'candidiasis'. 'Prevalence' means prevalence amongst patients reporting vaginal discharge or pruritus vulvae to their practitioner.

Aims

The aims of the study were:

1. To measure the frequency of association of these reported symptoms with the demonstrable presence of yeast organisms.
2. To assess the reliability of clinical diagnosis.

Reliability of laboratory method

With these aims in mind, the reliability of laboratory techniques must first be established. Before the definitive study, therefore, this was examined in two ways:

1. Sensitivity and specificity of culture techniques. A series of yeast-inoculated and non-inoculated swabs was prepared by one of us (A.P.), and placed in standard containers. After being allowed to lie for varying lengths of time at various temperatures the swabs were plated, and the remainder of the swab dropped into broth. Both plate and broth were incubated for 24 hours at 37°C; the plate was then examined by an independent observer. If at this time the plate was yeast-negative, a further plate was prepared from the broth, incubated, and examined.

In no instance did an inoculated swab, treated in this way within three weeks of preparation, fail to produce a

positive plate; or a non-inoculated swab a negative one. However, two out of seven yeast-inoculated swabs which were left lying for more than three weeks produced false negative results.

2. Comparative reliability of direct plating, and of plating preceded by broth culture. In a few instances, however, plating of the incubated broth produced a positive result whereas the direct plating of the inoculated swab had produced a negative result.

In the study, therefore, it was arranged that all swabs submitted by the practitioners should initially be cultured in broth for six hours before plating. The plate and the remaining broth were then both incubated for 24 hours; if the plate was read as negative, further specimens of broth were plated for subsequent reading.

Since all the swabs sent by practitioners were received within three days (and the majority within 24 hours) of being taken from the patient, this preliminary work appeared to justify the assumption that both the sensitivity and specificity of the laboratory methods were satisfactory.

Method

Forty-five general practitioners in the Yorkshire region participated in the study. Recruitment of patients was confined to non-pregnant women, aged 16 or over, whose primary complaint was of vaginal discharge or pruritus vulvae; it was decided that at least 100 patients with demonstrable vaginal candidosis should be recruited.

At the first consultation the practitioner was asked to complete a standardized record of history and examination findings; to take a first high vaginal swab; to provide the patient with a seven-day supply of pharmacologically inactive pessaries, with instructions on their use; and to arrange reattendance in one week's time. Before the second consultation, the result of this first swab was forwarded to the practitioner.

At the second consultation, for those patients whose swab was yeast-*negative,* the practitioner was asked to complete a further updated record of history and physical findings; to take a second high vaginal swab; to arrange for follow-up review in three months' time; and to initiate any care he felt desirable.

For those patients whose first swab had proved *positive,* he was asked to complete a further similar record and take a second high vaginal swab; to prescribe a two-week programme of treatment defined by the research office; and to arrange for a third consultation, one week after the completion of treatment.

The second swab was then cultured. Where a negative first swab was followed by a positive second swab, the doctor was contacted at once and asked to begin the defined course of treatment for two weeks.

At the third consultation (one week after the completion of treatment), the practitioner was asked to complete a further updated record, and take a third high vaginal swab. If this third swab proved positive, the doctor was asked to prescribe another defined (but different) course of treatment and arrange for a further swab at its completion.

Follow-up

All the practitioners were asked to review their patients three months after the first negative swab had been achieved, to complete a standardized record form, and to take a final swab.

Table 1. Frequency of spontaneous conversion.

Result of initial swab		Result of second swab		
	Number	Not recorded	Negative	Positive
Negative	111	12	89	10
Positive	102	2	18	82

Results

The prevalence of yeast infections amongst complainants

A total of 213 women with symptomatic vaginal discharge or pruritus vulvae were recruited. From these, a positive initial swab was obtained in 102 patients (48 per cent).

In addition, however, there were a number of patients in whom an initially negative swab was followed (after one week's placebo treatment) by a positive swab, and *vice versa.* The frequency of this spontaneous swab conversion is shown in Table 1.

Thus, of 99 patients found to be initially swab negative, 10 were found to provide a second swab that was positive: while out of 100 patients who were initially swab positive, 18 were found to have become swab negative.

The origins of spontaneous swab conversion. Spontaneous swab conversion was thus common in this study, which raises the question, "Why?".

The preliminary work on the reliability of laboratory techniques indicated clearly that such conversion was unlikely to have arisen from false positive or false negative cultures resulting from laboratory method. One can only hypothesize, therefore, that these conversions represent either a spontaneous appearance/disappearance of the organism within the vagina, or that the organism is patchily distributed in the vagina and the results of swabbing show chance variations in consequence.

Prevalence. As Table 1 shows, the percentage positive rate after two swab tests was 52.6 per cent (102 plus 10

Table 2. Association of symptomatic discharge with candidosis in 213 patients. (Percentages in brackets.)

	Number	Swab negative	Swab positive
Symptomatic discharge			
Present	174	89 *(51)*	85 *(48)*
Absent (i.e. patient complaining of pruritus)	38	21 *(55)*	17 *(45)*
Not recorded	1		
Duration			
< 3 months	116	56 *(48)*	60 *(52)*
3 to 6 months	11	7 *(64)*	4 *(36)*
> 6 months	41	23 *(56)*	18 *(44)*
Not applicable/ not recorded	45		
Discharge			
Intermittent	90	46 *(51)*	44 *(49)*
Continuous	78	40 *(51)*	38 *(49)*
Not applicable/ not recorded	45		
Past history of discharge			
Present	143	72 *(50)*	71 *(50)*
Absent	69	38 *(55)*	31 *(45)*
Not recorded	1		

Table 3. Association of observed discharge with candidosis in 213 patients. (Percentages in brackets.)

	Number	Swab negative	Swab positive
Amount			
Nil	21	13 *(62)*	8 *(38)*
Scanty	84	47 *(56)*	37 *(44)*
Moderate	89	45 *(51)*	44 *(49)*
Profuse	16	4 *(25)*	12 *(75)*
Not reported	3	2	1
$\chi^2 = 6.05$ with 1 d.f.: significant ($p < 0.02$)			
Colour			
White	138	66 *(48)*	72 *(52)*
Yellow	43	24 *(56)*	19 *(44)*
Brown	5	5 *(100)*	0 *(0)*
Red	1	1 *(100)*	0 *(0)*
Not applicable/ not recorded	26	15	11
$\chi^2 = 3.59$ with 1 d.f.: not significant			
Consistency			
Watery	48	30 *(63)*	18 *(37)*
Viscous	116	53 *(46)*	63 *(54)*
Not applicable/ not recorded	49	28	21
$\chi^2 = 3.19$ with 1 d.f.: not significant			

Table 4. Association of pruritus with candidosis in 213 patients. (Percentages in brackets.)

	Number	Swab negative	Swab positive
Pruritus			
Present	174	78 *(45)*	96 *(55)*
Absent	38	33 *(87)*	5 *(13)*
Not recorded	1	0	1
$\chi^2 = 20.4$ with 1 d.f.: highly significant ($p < 0.001$)			
Duration			
< 3 months	143	61 *(43)*	82 *(57)*
3 to 6 months	5	3 *(60)*	2 *(40)*
> 6 months	18	9 *(50)*	9 *(50)*
Not applicable/not recorded	47	38	9
$\chi^2 = 0.06$ with 1 d.f.: not significant			
Past history of pruritus			
Present	130	63 *(48)*	67 *(52)*
Absent	79	45 *(57)*	34 *(43)*
Not recorded	4	3	1
$\chi^2 = 1.1$ with 1 d.f.: not significant			

out of 213 patients): that is, there was a one-in-two chance of candida being isolated when vaginal discharge or pruritus were reported to the practitioner. Candidosis is thus commonly associated with these symptoms in general practice.

In Tables 2 to 5 the findings reported are based on the results of the initial swabs.

The reliability of clinical diagnosis

The association of symptomatic discharge with vaginal candidosis is summarized in Table 2. There were no features of the discharge as reported by the patient which readily distinguished patients with vaginal candidosis from those without.

The doctors' observations on the amount of discharge (as distinct from its colour or consistency), however, showed a statistically significant difference between the association of candidosis with discharge regarded as 'profuse' and its association with discharge regarded as 'moderate' or 'scanty' (Table 3). Interestingly, the doctor observed discharge more frequently than the patient complained of it.

The association of pruritus vulvae with candidosis is summarized in Table 4. While the absence of pruritus is strongly suggestive of the absence of candidosis, the presence, duration, and past history of pruritus are not helpful to diagnosis.

Finally the association of candidosis with observed

abnormality of the labia, vaginal walls, and cervix were investigated. At none of these sites were positive signs found to be reliable indicators of candidosis.

Summary of diagnostic findings

From these findings it is clear that, no matter how skilled the clinician, the clinical diagnosis of candidosis will inevitably be haphazard in its reliability.

This conclusion was confirmed by an additional finding. In the study each practitioner was requested, at the first consultation, to record his clinical diagnosis and this was then compared with the subsequent mycological diagnosis. The results are summarized in Table 5.

When a positive clinical diagnosis of candidosis was made, it was just as likely to be right as to be wrong; when a negative diagnosis was made there was still only a two-to-one chance of it being correct.

Table 5. Correlation of clinical and laboratory diagnosis in 213 patients. (Percentages in brackets.)

	Number	Swab negative	Swab positive
Clinical diagnosis			
'Candida'	144	70 *(49)*	74 *(51)*
'Not candida'	55	37 *(67)*	18 *(33)*
Not reported	14		

Discussion

Prevalence

Over the past 10 to 20 years the isolation rate of vaginal yeasts appears to have increased amongst patients attending hospital clinics. Thus Couchman (1974) reported a 10-fold increase in 'non-specific' vaginitis in the preceding 20 years and found that approximately 30 per cent of these patients had vaginal candidosis. Others (Oriel *et al.*, 1972; Schnell, 1974; Hilton and Warnock, 1975) have reported prevalence rates in similar circumstances varying between 26 per cent and 33 per cent. Jeffcoate (1975) appeared to have no doubt that there had been an appreciable increase in prevalence when he wrote: "In non-pregnant women the commonest cause is the taking of antibiotics . . . indeed the irresponsible use of these is mainly responsible for the widespread manifestation of candidosis." Catterall (1971) was even more categorical in commenting that *"Candida albicans* has now replaced *Trichomonas vaginalis* as the commonest cause of genital symptoms in women".

Several workers (Rohatiner and Grimble, 1970; Oriel *et al.*, 1972; Hilton and Warnock 1975) have suggested that, in non-pregnant patients, the prevalence of candidosis is much greater amongst women attending venereal disease clinics than in other groups of females. However, in the present group of women reporting symptoms to their practitioner the prevalence was 52.6 per cent.

All these reports regarding prevalence underline the obvious, but important, principle that such studies can do no more than define the prevalence of candidosis in the particular setting in which the study is undertaken. Probabilities based on the prevalence observed in hospital clinics cannot validly be extrapolated to general practice. Equally, the prevalence rate found among the symptomatic complainants of the present study cannot be extrapolated to the female population in the community.

Clinical diagnosis

Here we agree with Oriel and colleagues (1972) who comment that "it seems unlikely that a clinical diagnosis of vaginal mycosis can be made with accuracy". Indeed the present study clearly suggests that clinical diagnosis is necessarily haphazard in its reliability.

Laboratory diagnosis

While the potential reliability of transport and culture techniques in identifying yeast-infected vaginal swabs appears from the present work to be established, the reliability of vaginal swabbing is not. Whether the observed 'spontaneous' swab conversions are due to a patchy distribution of the yeast within the vagina (with consequent unreliability in swabbing itself), or are due to spontaneous appearances and disappearances of the organism, the fact that such conversion occurs may be a source of bias in prevalence studies and therapeutic trials alike.

References

Catterall, R. D. (1971). *British Journal of Venereal Diseases,* **47**, 45-47.

Couchman, J. M. (1974). *Postgraduate Medical Journal,* **50**, Suppl. 1, 93-94.

Hilton, A. L. & Warnock, D. W. (1975). *British Journal of Obstetrics and Gynaecology,* **82**, 922-926.

Jeffcoate, Sir N. (1975). *Principles of Gynaecology.* 4th edition. London: Butterworths.

Oriel, J. D., Partridge, B. M., Denny, M. J. & Coleman, J. C. (1972). *British Medical Journal,* **4**, 761-764.

Rohatiner, J. J. & Grimble, A. (1970). *Journal of Obstetrics and Gynaecology of the British Commonwealth,* **77**, 1013-1015.

Schnell, J. D. (1974). *Postgraduate Medical Journal,* **50**, Suppl. 1, 79-81.

Acknowledgements

We acknowledge with gratitude the funding provided for this study by the West Riding Medical Research Trust; and, for the pilot study, by the Research Foundation Board of the Royal College of General Practitioners. Our thanks are also due to Messrs E. R. Squibb and Sons who provided the placebo pessaries; to Mr Alan Geekie and Dr W. Sutcliffe, from the Department of Community Medicine, University of Leeds, for help with the analysis of data; and, not least, to our secretaries, Mrs Pam Hick and Miss Kath Edwards, who undertook all the secretarial work involved. Finally, without the generous co-operation of the practitioners involved the study would not have been possible; we are indeed grateful for their enthusiasm and consistency.