

# How Useful Are Symptoms in the Diagnosis of Candida Vaginitis?

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Two hundred four female subjects symptomatic and asymptomatic for genitourinary disease were evaluated for *Candida* vaginitis. All were questioned regarding the presence or absence of a variety of symptoms related to the genitourinary system, including vaginal discharge, its color, if present, pruritus, dysuria, and the like. Additionally, all subjects were cultured for *Candida* by use of Sabouraud agar.

Thirty-six subjects demonstrated cultures positive for *Candida*. Of 36 totally asymptomatic subjects, 4 had positive cultures, yielding a prevalence (18 percent) and asymptomatic positive rate (11 percent) consistent with those reported in the literature.

All genitourinary symptoms individually and in combinations proved to be very poor predictors of the presence of *Candida* on culture. The study concludes that the diagnosis of *Candida* vaginitis cannot be made based on symptoms alone. A suggestion describing the office workup of *Candida* vaginitis is presented.

Vulvovaginitis symptoms routinely present the physician with a significant diagnostic challenge. Numerous causative agents create a lengthy differential diagnosis. The prevalence of *Candida* vaginitis has been estimated conservatively by one author as 5 percent,<sup>1</sup> while others cite figures as high as 17 percent.<sup>2</sup> Clinical teaching directs the investigation of this entity toward the consideration of a host of risk factors (obesity, pregnancy, diabetes, and use of oral contraceptives or broad spectrum antibiotics), symptoms (white vaginal discharge, pruritus, local edema), and physical findings (presence of discharge and its color, and the results of a potassium hydroxide [KOH] preparation). Unfortunately, when the KOH test proves negative, the clinical diagnosis of *Candida* vaginitis remains tentative at best. The clinician at this point must elect to initiate therapy, obtain a *Candida* culture and initiate therapy, or obtain a

culture and await its result.

The literature offers many examples of authors who imply that some vaginitis symptoms may be quite suggestive of infection with *Candida*.<sup>1-4</sup> Odds<sup>1</sup> remarks in a section on "clinical features" of vulvovaginal *Candida* infection: "acute pruritus and discharge are the commonest presenting complaint, but neither symptom is invariably associated with the disease." Greenhill<sup>3</sup> in his textbook mentions, "in typical cases of candidiasis, the vulva is considerably reddened and congested. Since in nearly all cases there is considerable itching, the vulva may show excoriations from scratching."

This study considers whether there exists a symptom complex that indeed can function as a reliable predictor of the diagnosis *Candida* vaginitis.

Should such a group of symptoms exist, obvious implications for management of this disease entity emerge. For example, a patient could discuss vaginitis symptoms by telephone, and if they corresponded to the highly predictive complex, appropriate therapy could be administered without

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the cost of an office visit. Failure to respond to therapy would mandate formal evaluation. The study examines whether symptoms of white vaginal discharge and pruritus predict the diagnosis of *Candida* vaginitis. These two symptoms selected are those deemed most accurate from the training and clinical experience of the authors and their associates and from those commonly mentioned in the literature.<sup>1-4</sup>

## Methods

Two hundred four women between the ages of 18 and 81 years were studied between September 1, 1980, and September 20, 1981. All participants were patients of the Family Medical Center, the clinical training site of the residency in family practice, University of Washington School of Medicine. Eligibility for the study required a reason that would necessitate pelvic examination, such as Pap smear, contraception, and a variety of genitourinary symptoms.

A nurse practitioner administered an interview questionnaire to each subject, asking whether various genitourinary symptoms had been present at the time of office visit, such as dysuria, pruritus, dysmenorrhea, urinary frequency, vaginal discharge and, if present, its color, and dyspareunia among others.

Each subject, regardless of symptom status, underwent a pelvic examination by the nurse practitioner. In every case, the nurse practitioner obtained a vaginal swab from the left lateral vaginal wall and the site of apparent clinical lesion, if present. The swab was then applied to a slant of standard Sabouraud agar and delivered to a University of Washington mycology consultant for the determination of whether *Candida albicans* grew out after the 48-hour incubation period.

The most frequently associated symptoms of *Candida* vaginitis, ie, vaginal discharge, its color, and the presence or absence of pruritus and their combinations, were analyzed by conventional data-processing technique. The specific task was to determine which symptoms would yield the greatest sensitivity and specificity toward predicting a positive *Candida* culture. Those of the study's hypothesis and those demonstrating the highest predictive values are presented.

## Results

Thirty-six subjects of the total 204 denied all genitourinary symptoms. Of these 36, 4 proved to

**Table 1. Asymptomatic Carrier Rate and Prevalence of Positive *Candida* Cultures**

	Positive <i>Candida</i> Cultures (%)
Asymptomatic (n=36)	4 (11) (asymptomatic rate)
Total (n=204)	36 (18) (prevalence rate)

have vaginal swab specimens positive for *Candida* on culture. This represents an 11 percent asymptomatic carrier state in the study population. Of the 204 subjects, 36 were culture positive, an 18 percent prevalence (Table 1).

Accuracy of various genitourinary symptom complexes in predicting a positive *Candida* culture proved poor. The initial hypothesis, that a white discharge and pruritus would lead to a conclusive diagnosis, was not supported. Of 28 individuals presenting with both a white vaginal discharge and pruritus, 7 developed positive cultures, yielding 20 percent sensitivity and an 88 percent specificity. The two best symptom predictors, vaginal discharge of any color combined with pruritus, and pruritus as a single symptom, each registered poor positive predictive values (29 percent and 31 percent, respectively) and mediocre sensitivity (42 percent and 50 percent, respectively). Other symptom combinations fared even less well (Table 2). Of all other possible symptom combinations noted in Table 2, none were successful at predicting the presence of *Candida*.

## Discussion

The results did not substantiate the study hypothesis. A patient having a white vaginal discharge and pruritus can be expected to have a positive *Candida* culture only 25 percent of the time. Despite the somewhat more impressive performance of some of the other symptom combinations, none emerge as candidates for assuming the status of "classic symptoms" of *Candida* vaginitis. Thus the telephone diagnosis and treatment of *Candida* vaginitis by symptoms would be inaccurate.

The study, in fact, supports comments by other authors. Odds<sup>1</sup> remarked that "the accurate diagnosis of vaginal thrush requires both clinical and laboratory information," after offering most vaginitis symptoms as possibly linked to *Candida* in-

**Table 2. Genitourinary Symptoms and Their Ability to Predict the Presence of *Candida albicans* in Vaginitis (total subjects, 204; total positive cultures, 36)**

Symptom Complex	Subjects with Positive Cultures	Sensitivity (%)	Specificity (%)	Predictive Value
White vaginal discharge with pruritus (n=28)	7	19	88	25
Pruritus without discharge (n=8)	3	8	97	38
Pruritus, discharge (not white) (n=31)	11	31	88	36
Pruritus, regardless of discharge (n=59)	18	50	76	31
Discharge (any color) with pruritus (n=51)	15	42	79	29
Discharge (not white) regardless of pruritus (n=46)	11	31	79	24
Any discharge, regardless of pruritus (n=98)	20	56	54	20
White discharge, regardless of pruritus (n=53)	10	28	75	19

\*Hypothesized as most effective predictor

fection. O'Brien<sup>5</sup> noted a "60 percent error rate in the clinical versus culture diagnosis" in the group he studied. He found a 14 percent asymptomatic carrier rate compared with 11 percent in this study. His 21 percent prevalence rate represented the high extreme in a literature ranging down to 12 percent.<sup>2,5,6</sup> This study recorded an 18 percent prevalence rate. Jeffcoate<sup>7</sup> in his textbook concluded, "50 percent of the time the diagnosis (of *Candida* vaginitis) is missed without a culture," and Schurz et al<sup>6</sup> flatly stated that "symptoms are not sufficient to diagnose *Candida* infection." Finally, according to Weissberg,<sup>2</sup> "although the differential diagnosis of vaginitis may sometimes be possible on the basis of clinical evaluation and microscopy, these procedures are frequently not pathognomonic; various organisms create symptoms that are not clearly differentiated."

### Conclusion

This study clearly demonstrates that symptoms do not predict the diagnosis of *Candida* vaginitis. Telephone diagnosis of this infection cannot be recommended. In recommending optimum management in this clinical situation, other studies are helpful. The KOH preparation, when negative, does not necessarily indicate the absence of the organism.<sup>8</sup> Furthermore, it was demonstrated that

the inexpensive Microstic *Candida* and Nickerson's medium culture for *Candida* compared favorably in accuracy with the "gold standard" mycology medium, Sabouraud agar.<sup>8</sup> Thus patients with vaginitis symptoms not obviously due to another agent could perhaps best be managed by initially obtaining a KOH preparation evaluation. If that proved to be negative, a *Candida* culture could be implemented (48-hour incubation), and the patient could either await its result or be treated while awaiting the culture result. The effectiveness of treatment in symptomatic women who are KOH negative and culture positive requires further evaluation.

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