Asymptomatic Vaginal Disease in Pregnancy

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SUMMARY

Asymptomatic *Trichomonas vaginalis*, candidiasis and *Haemophilus vaginalis* were found to affect approximately 20% of women attending an antenatal clinic for the first time. Eight patients (1,4%) had asymptomatic gonorrhoea. Clinical features, such as pruritus and the appearance of a discharge, were frequently misleading, whereas examination of routine Papanicolaou smears enabled the correct diagnosis to be made in most cases. The need for the early recognition and treatment of asymptomatic vaginal disease in pregnancy is commented upon.

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Pregnancy is one of the few physiological conditions during which most women seek medical advice. An excellent opportunity is thus provided to screen a large sector of the normal population for asymptomatic disease.[1] Clinical vaginitis is one condition which may easily be missed and so predispose to neonatal complications, such as oral thrush and ophthalmia neonatorum. A prospective study was therefore undertaken to determine the incidence of asymptomatic vaginal disease in pregnancy, and to compare the clinical presentation of this condition with the various laboratory methods of diagnosis. The investigation was conducted under field conditions, to assess the accuracy of clinical personnel working under normal consulting circumstances.

PATIENTS AND METHODS

Patients attending the Antenatal Clinic at Addington Hospital for the first time were studied. A total of 720 patients were examined, of whom 186 were White and 534 non-White. After the taking of relevant histories, the patients were examined vaginally, and the clinical features noted. Cervical and vaginal secretions were obtained for direct inoculation onto various culture media; for microscopical examination of the fresh specimen, and for preparation as a routine Papanicolaou smear. The clinical examination and taking of specimens were performed by 3 registrars working in the Department of Obstetrics; the microbacteriology by a trained medical technologist (W.J.); while Papanicolaou smears were processed in the routine fashion. The clinical findings were not made known to the microbiologist or to the cytologist.

The media used for culture were: blood agar (for identification and isolation of staphylococci and streptococci); MacConkey's agar (for identification of *Escherichia coli, Proteus* and other non-lactose fermentors); chocolate agar (for identification of *gonococcus* and *Haemophilus vaginalis*); Mueller-Hinton media (for *Neisseria gonorrhoeae* and *Haemophilus vaginalis*); tomato agar (for identification and isolation of lactobacilli and candida); Sabouraud's media (for isolation of *Candida*); and cornmeal agar (for specific identification of *Candida albicans*). Wet preparations were examined microscopically for evidence of *Trichomonas vaginalis*. Pus cells on microscopical examination of the vaginal smear denoted active infection.

Four organisms commonly associated with vaginitis were looked for, namely: *Trichomonas vaginalis, Candida albicans, Haemophilus vaginalis* and *Neisseria gonorrhoeae*. Their incidence was compared with Döderlein's bacillus, a known vaginal commensal organism.

Subjects who presented without symptoms or clinical signs, and in whom pus cells were not observed on microscopy of the vaginal secretion, were classed as normal. There were 258 subjects in this category (71 Whites and 187 non-Whites).

Patients who presented with no symptoms but who had clinical signs of disease were classified as having asymptomatic vaginal disease. Four hundred and fifty-two patients qualified for this category (115 Whites and 337 non-Whites).

RESULTS

Normal Flora

Table I reflects the incidence of the various organisms in the so-called 'normal' group. Whereas Döderlein's bacillus was distributed equally between the 2 racial groups, a marked difference was noted for all the other organisms. *Trichomonas* and *N. gonorrhoeae* are known pathogens and their presence indicates an abnormal state. There is more difficulty when interpreting the significance of *H. vaginalis* and *Candida*, since some species are thought to be part of the normal flora of the vagina. When assessing the degree (albeit empirical) of candidiasis in our study group, it was noted that values of 1+ or less were equally distributed among the two racial groups. When yeast cells were found in greater quantities, i.e. ++ or more, a marked difference in the incidence of involvement was noted (Whites 7%, non-Whites 18,6%). This suggests that values of ++ or more are representative of a pathological state, while lower values are indicative of normal commensals (Table II). The same was noted for *H. vaginalis*.

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TABLE I. DISTRIBUTION OF VAGINAL FLORA IN NORMAL PREGNANCY

		Trichomonas vaginalis (%)	Candidiasis (%)	Gonorrhoea (%)	*H. vaginalis* (%)	Döderlein bacilli (%)
Whites	71	5,6	36,5	0	8,3	60
Non-Whites ...	187	13,3	50,0	0,5	16,0	62
Total ...	258	11,2	46,2	0,4	14,0	61

TABLE II. DIFFERENTIATION OF PATHOLOGICAL FROM COMMENSAL VAGINAL CANDIDIASIS ACCORDING TO THE NUMBER OF ORGANISMS PRESENT

	Degree					Control
	Scanty (%)	+ (%)	++ (%)	+++ (%)	++++ (%)	Döderlein bacillus (%)
Whites (71)* ...	15,3	13,8	2,8	2,8	1,4	
	29,1		7,0			60
Non-Whites (187)* ...	22,9	8,5	4,8	11,7	2,1	
	31,4		18,6			62

* Number of patients in brackets.

Patients were therefore considered to have 'vaginal disease' if examination of the secretions revealed the presence of *N. gonorrhoeae; Trichomonas; Candida* ++ or more, and *H. vaginalis* ++ or more.

On this basis, no fewer than 11,2% of all 'normal' subjects (i.e. without symptoms or signs of vaginal disease), had evidence of *Trichomonas vaginalis;* 14% had *H. vaginalis*; and 0,5% gonorrhoea. 'Pathological' candidiasis occurred in 12,8% of the normal group.

Asymptomatic Disease

Patients who had clinical evidence of vaginitis but who did not present to the clinic with symptoms, were regarded as having asymptomatic disease. The incidence is set out in Table III.

TABLE III. INCIDENCE OF ASYMPTOMATIC VAGINAL DISEASE IN PREGNANCY

	Trichomonas (%)	Candidiasis (%)	*H. vaginalis* (%)	Gonorrhoea (%)
Whites (115)*	7,8	6,2	13,9	0
Non-Whites (337)*	20,7	20,9	20,9	1,7
Total (452)*	17,5	17,3	20,0	1,4

* Number of patients in brackets.

Pruritus as a Symptom

The significance of pruritus was examined, since it is one of the characteristic features which differentiates a pathological discharge from leucorrhoea.

A total of 147 patients presented with this symptom (63 Whites, 84 non-Whites). Surprisingly only 38% of the Whites complaining of pruritus had evidence of some form of infection (*Trichomonas, Candida, H. vaginalis,* pus cells or a combination of these). The respective figure of 80% in the non-White group was much closer to our anticipated estimation.

Clinical Accuracy

The accuracy of the clinical diagnosis was assessed by comparing the appearance of the vaginal secretion with the laboratory result. Only 47,5% of all discharges thought to be *Trichomonas vaginalis* were confirmed (12% proved to be *Candida*). The results were better when *Candida* was diagnosed, since 73% were correctly identified. Of 'monilia-like' discharges 5,5% were misdiagnosed and were found to be due to *Trichomonas*. In the 'non-specific group', 50% of subjects were found to have no specific organisms; 29% were shown to have candidiasis, while 21,5% of so-called non-specific discharges were due to *Trichomonas vaginalis*.

Value of the Papanicolaou Smear

To ascertain the value of the Papanicolaou smear in the diagnosis of vaginal disease in pregnancy, the incidence of *Trichomonas vaginalis* diagnosed by this method was compared with the laboratory result. Although there were some instances of disagreement, i.e. laboratory result positive and Papanicolaou smear negative, and vice versa, the over-all correlation between these two diagnostic methods was highly similar. Thus the pick-up rate of *Trichomonas vaginalis* among Whites with the laboratory technique was 8,4% *v.* 9,0% with the Papanicolaou smear (Table IV).

TABLE IV. VALUE OF THE PAPANICOLAOU SMEAR IN THE DIAGNOSIS OF TRICHOMONAS VAGINITIS AND CANDIDIASIS USING LABORATORY CULTURE AS A CONTROL

	Trichomonas		*Candida*	
	Lab. + (%)	Pap. + (%)	Lab. + (%)	Pap. + (%)
Whites (224)*	8,4	9,0	5,4	11,5
Non-Whites (531)*	18,6	20,7	25,0	16,3

* Number of patients in brackets.

The same correlation was not obtained when screening for *Candida.* Almost twice as many positive results were noted among Papanicolaou smears taken from Whites. The greater incidence probably relates to isolated yeast cells being detected on the smear, while positive laboratory diagnosis referred to patients in whom ++ or more were

found. Conversely, culture yielded more positive results in the non-Whites.

DISCUSSION

The presence of vaginal organisms such as *N. gonorrhoeae* and *Trichomonas vaginalis* is indicative of a diseased state. The diagnosis of vaginitis — especially if unassociated with obvious clinical signs — is much more difficult when the organism isolated may be a normal commensal of the vagina. Occasional yeast spores found in a vaginal smear serve as an example. Reference to the literature is conflicting. Hurley[2] refers to *C. albicans* as a 'normal' commensal of the vagina, occurring in some 36% of pregnant females.[2] More recently, in a well-documented prospective study of 303 pregnant women, Carroll *et al.*[3] detected *C. albicans* in 16,5% of patients, only once from a healthy vagina. They concluded that the presence of genital yeasts was indicative of a diseased state and contradicted the long-held belief that *C. albicans* is often a commensal of the healthy vagina.[4] The same conclusions were reached by Oriel *et al.*[5] when studying a group of women attending a venereology clinic.

Of the many species of yeasts found in the vagina, only *C. albicans* and *Torulopsis glabrata* are thought to be of pathogenic significance,[6] although the latter rarely produces symptoms.[7] The yeasts in our study were not differentiated, but since *C. albicans* is found in some 75 - 95% of patients with significant monilial vaginitis, we can safely assume that the predominant yeast in our series was *C. albicans*.[5,6] We arbitrarily divided our study material into patients with ++ or more, and regarded them as having candidiasis of pathogenic significance. Of our patients 12,8% were affected. As the majority of our patients (77,2%) did not yield positive cultures, we agree with Carroll *et al.*[3] that the isolation of *C. albicans* in the vagina of pregnant patients is associated with morbidity and is indicative of disease of the lower genital tract.

Although *H. vaginalis* (*Corynebacterium vaginale*) has been isolated from women who have had no gynaecological complaints,[8] this organism is now known to be pathogenic and is responsible for so-called 'non-specific' vaginitis.[9] *H. vaginalis* may be readily diagnosed by Gram-staining, culture and immunofluorescent techniques. Lewis and O'Brein[10] demonstrated that Papanicolaou smears could also be used for the cytological diagnosis of *H. vaginalis*, and this technique was used in the present study. With this diagnostic medium, 8,3% of 'normal' Whites and 16,0% of 'normal' non-Whites were found to have *H. vaginalis* on assessment of routine Papanicolaou smears.

Patients who may have had clinical evidence of vaginal disease but who did not present to the clinic with symptoms were classified as having had asymptomatic vaginal disease in pregnancy (Table III). Of the 337 non-Whites in this category, no fewer than 1 out of every 5 had evidence of significant vaginal disease. The incidence was lower for Whites. The over-all incidence of candidiasis is similar to that of other series.[6]

N. gonorrhoeae was isolated from the vaginal secretions in 8 of our patients (1,4%), all of whom were asymptomatic. Because of the frequently asymptomatic nature of gonorrhoea[11,13] the genital tract may harbour the gonococcus in 2,2 - 30% of women.[11] Data regarding the incidence of gonorrhoea vary tremendously, depending upon the population studied and the technique used. For example, in a recent screening survey of 13 725 women attending a Planned Parenthood Clinic, 1,2% had confirmed positive cultures, while in a private practice situated in the same city, a pilot study of 320 consecutive patients failed to demonstrate a single case of gonorrhoea.[12] In yet another study involving 231 unselected private patients, 2,6% produced positive gonococcal cultures.[13] The need for improved diagnostic media is also obvious. Thayer-Martin selective medium is much more sensitive than, for instance, Gram-stain. This medium was not available for our study and it is therefore possible that our figure of 1,4% is an underestimate of the true situation. Antenatal tests for syphilis have been accepted medical practice for many years. Although reliable serological screening for gonorrhoea is not yet available, practitioners can and should screen pregnant patients for gonorrhoea.

Apart from an obvious discharge, pruritus or a vulval irritation is the most likely symptom that will bring a patient to a doctor. The significance of this symptom, however, depends in large measure on the fastidiousness of the patient concerned. Although other causes of pruritus, such as the use of vaginal deodorants, were not inquired into, it would appear that the significance of this symptom is often exaggerated. Oriel *et al.*[5] found pruritus in only 50% of their patients with yeast infections.

Another interesting observation was the error in the clinical diagnosis of vaginal discharges, as judged by their appearance. Although the examiners were relatively inexperienced, the 'typical' appearance of vaginal discharges is frequently misleading. The 'thrush plaque' is said to be pathognomonic of candidiasis.[3] This was confirmed in the present study since 73% of monilial discharges were correctly diagnosed — a figure closely approximating the 77,6% quoted by Peeters *et al.*[7] The clinical presentation of trichomonas vaginitis however is much more variable, only 47,5% of our patients having the characteristic yellow green frothy discharge and injected vagina.

When we compared the reliability and accuracy of the various diagnostic methods, using the laboratory as our control, the Papanicolaou smear was found to be the most accurate means of diagnosing trichomonas vaginitis (see Table V). Clinical signs were much more reliable in the diagnosis of candidiasis.

TABLE V. ACCURACY OF DIAGNOSING ASYMPTOMATIC VAGINAL DISEASE IN PREGNANCY: A COMPARISON OF 3 DIAGNOSTIC METHODS USING LABORATORY CULTURE CONTROL

	Laboratory culture (control)	Routine Pap. smear	Clinical signs	Clinical symptoms, pruritus
Trichomonas	82,5%	88,0%	47,5%	28,5%
Candidiasis	96,0%	81,5%	73,0%	32,0%

It may therefore be concluded that both trichomonas vaginitis and significant moniliasis are often asymptomatic, but that evidence of their presence can frequently be detected by routine Papanicolaou smears. *H. vaginalis* was not included in this part of the study.

SHOULD ONE TREAT ASYMPTOMATIC VAGINITIS?

The decision is easy when organisms such as *N. gonorrhoeae* and *Trichomonas vaginalis* are found. With candidiasis and *H. vaginalis* the position is less clear since comparatively little is known about the biological circumstances which cause asymptomatic vaginal discharges to become symptomatic. Alteration in the vaginal pH may be an important factor. Cohen[14] has shown that patients with the severest symptoms have the lowest pH. He maintains that the pH of the vagina is dependent upon fermentation of the glycogen of the shed epithelial cells and the cervical mucus. Excessive shedding of the epithelium and invasion of the deeper layers by normally benign saprophytic organisms occur, and this results in their becoming pathogenic. The shedding of the epithelium may be regulated by the amount of circulating oestrogen. Cohen has also shown that patients with low vaginal pH are relatively resistant to treatment, while patients with a high pH may harbour yeasts and *Trichomonas* and yet remain symptomless. Further, there is no way of predicting which women with asymptomatic yeast infections may later develop a clinical mycosis. Carroll *et al.*[3] and others[5] therefore believe that the isolation of *C. albicans* from the vagina indicates the need for specific antifungal therapy, irrespective of whether symptoms or signs of vaginal mycoses are present. We are of the same opinion, especially when one appreciates, for example, that the incidence of oral thrush is 35 times more common in children born to women with vaginal candidiasis than in those who are free from disease.[2]

Fortunately patients with asymtomatic vaginal disease during pregnancy can be safely treated without adversely affecting mother or child.

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