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Research Article

Comparison of Liquid Based Cytology and Conventional Pap in Patients of Abnormal Vaginal Discharge Presenting with Pruritus Vulvae

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A B S T R A C T

Introduction: Vaginal discharge is one of the most common vaginal symptoms. Conditions causing vaginal discharge with pruritus vulvae are Candidiasis, Bacterial vaginosis and Trichomonas vaginalis. These can be diagnosed on cytology and confirmed by culture. This study was undertaken in patients to assess the efficacy of Liquid Based Cytology (LBC) and Conventional Pap (CP) and to know whether one of the methods has advantage over the other in cytologic diagnosis of infections.

Material and Methods: Paired samples for CP and LBC were collected from all the 40 patients of abnormal vaginal discharge presenting with pruritus vulvae. The smears were studied cytologically and sensitivity of each method was calculated Vaginals swabs were taken for culture.

Results: A total of 40 cases of abnormal vaginal discharge presenting with pruritus vulvae were studied. Total of 80% cases were in the reproductive age group (i.e. 20-50 years). LBC could diagnose 13 cases of bacterial vaginosis while CP diagnosed 14 cases with a sensitivity of 86.67% and 93.3% respectively. 6 cases were diagnosed cytologically as candidiasis by LBC and by 5 CP with a sensitivity of 75% and 62.5% respectively. LBC and CP both had a sensitivity of 50% in the detection of Trichomonas vaginalis.

Conclusion: Due to its cost effectiveness CP is as good as LBC in detection of specific infections especially in resource poor countries.

Keywords: Abnormal vaginal discharge, CP, LBC, Pruritus Vulvae

Introduction

Vaginal discharge is one of the most common vaginal symptoms. Conditions ranging from vaginal candidiasis to chlamydial cervicitis to bacterial vaginosis to cervical carcinoma may cause vaginal discharge.[1] The amount of normal vaginal secretion varies with age, in health and

disease. Pregnancy increases it and it is maximum in early days of puerperium and to a less extent after an abortion. It varies at different times in menstrual cycle, increasing at ovulation and just before menstruation.[2]

Abnormal vaginal discharge presenting with pruritus vulvae is most commonly seen in infective conditions such as:

- Bacterial vaginosis
- Trichomonas vaginitis
- Candida vaginitis[1,3]

Other conditions associated with vaginal discharge are:

- Chlamydial infection
- Gonococcal infection

Bacterial vaginosis is commonest cause of vaginal discharge in the reproductive age group. Gardnerella vaginalis is the organism most commonly associated with bacterial vaginosis. Other microorganisms isolated include genital Mycoplasma and Anaerobic bacteria such as Peptococcus, Bacteroides spp. and Mobiluncus spp. Lactobacilli are decreased or absent. The presence of clue cells is the most important cytological criteria for diagnosis. Bacterial vaginosis is diagnosed using Amsel's criteria.[4]

Trichomoniasis is almost entirely a disease of the childbearing era, though no age is immune. 70% patients show typical thin creamy or slightly green colored, irritating and frothy discharge. It should be suspected in all cases where discharge cause pruritus but diagnosis is made certain by demonstrating the presence of Trichomonas vaginalis organism, which can be done by wet mount, cervical cytology or culture among which culture is most reliable.[5]

Candida vaginitis is caused by yeast like microorganism called Candida. It is ordinarily nonpathogenic, being kept in check by bacteria. It is associated with discharge that is thick, curdy white and in flakes often adherent to the vaginal wall. It is diagnosed on wet smear, cervical cytology, or culture.[6]

Cervical cytology has an important role in the diagnosis of most of the above-mentioned infections and can be done by either the conventional Papanicolaou method or the liquid based cytology. Liquid based cytology of cervical specimens is characterized by excellent fixation, homogenous thin layer dispersal of cellular material, crisp cellular details and a clear background. This technology is rapidly replacing the conventional method for the screening and detection of cervical carcinoma and its precursors. Many studies comparing LBC with Conventional Pap for premalignant and malignant lesions of cervix have been done while very few studies comparing these two have been done on patients with abnormal vaginal discharge.

Thus, this study was undertaken in patients of abnormal vaginal discharge presenting with pruritis vulvae to assess the efficacy of both of these methods and to know whether one of the methods has advantage over the other, especially in resource poor areas.

Material and Methods

This study was conducted in the Department of Pathology S. N. Medical College, Agra on cervical smears of patients referred from Gynecology OPD, with the presenting complaint of abnormal vaginal discharge and pruritus vulvae from June 2015 - December 2015. A total of 40 cases of abnormal vaginal discharge presenting with pruritus vulvae were studied. A detailed clinical history including age, parity, marital status and nature of discharge was taken. The cases of physiologically increased discharge were excluded by history. The procedure was well explained to the patient and an informed consent was obtained from them. Paired samples for conventional smear and liquid based cytology were collected from all the patients. Vaginal swabs were taken for culture of candida and trichomonas. Both the CP and LBC smears were studied for adequacy and cytomorphology and the abnormalities were noted separately. A cytological diagnosis was determined by cytopathologist for each patientby both LBC and CP smears. Bacterial vaginosis was diagnosed when at least three of the following were present (Amsel's criteria): characteristic homogenous white adherent discharge; positive whiff test; vaginal fluid pH >4.5; clue cells representing at least 20% of the vaginal epithelial cells. For diagnosis of Trichomoniasis on smears, trophozoites were demonstrated. For candidiasis, fungal spores were demonstrated. Their results were compared with that of culture. Total number of cases diagnosed by LBC and CP were found and sensitivity calculated considering culture positive cases as true positives. Formula used for calculating sensitivity is: Sensitivity = number of true positives/ number of true positives + number of false negatives

Results

A total of 40 cases of abnormal vaginal discharge presenting with pruritus vulvae were studied cytologically by both CP & LBC. Patients age ranged from 20-70 years. Majority of the patients (28.75%) belonged to 31-40 years, closely followed by 20-30 years (27.5%), 41-50 years (23.75%), 51-60 years (11.25%) and 61-70 years (8.75%). A total of 80% cases were falling in the reproductive age group (i.e. 20-50 years). 27 patients presented with homogenous white adherent discharge, 10 with thick white discharge and 3 with greenish yellow discharge.

Out of 40 patients, 27 patients presented with homogenous white adherent discharge. 13/27 patients had pH >4.5. Clue cells were seen in 13 cases on LBC and 14 on CP. Whiff test was positive in 20 cases. A total of 15 cases

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were finally diagnosed as bacterial vaginosis as they were positive for >=3 features under the Amsel's criteria. So, LBC could diagnose 13/15 cases of bacterial vaginosis while CP diagnosed 14/15 cases with a sensitivity of 86.67% and 93.3% respectively (Table 2 and 5; Figure 1a and 1b).

Table 1.Distribution of patients on the basis of type of discharge

S. No.	Type of discharge	No. of patients
1	Homogenous white	27
2	Thick white	10
3	Greenish yellow	3

Table 2.Cases diagnosed as bacterial vaginosis according to Amsel's criteria

Criteria	No. of cases
Homogeneous white discharge	27
pH of discharge	<4.5 14 >4.5 13
Clue cells	LBC 13 CP 14
Whiff test positivity	20
Total no of cases diagnosed (i.e.≥3 features positive)	15

Table 3.Cases diagnosed as candida vaginitis

pH of discharge	Positive on cytology	Positive on culture	Total cases diagnosed
4-4.5	LBC 6 CP 5	8	8

Table 4.Cases diagnosed as trichomonas vaginalis

pH of discharge	Positive on cytology	Positive on culture	Total cases diagnosed
6-8	LBC 1 CP 1	2	2

Table 5.Sensitivity of LBC and CP in infections

	LBC	CP
Bacterial vaginosis	86.6%	93.3%
Candidiasis	75%	62.5%
Trichomonas vaginalis	50%	50%

8 patients were positive for fungal culture, of these,6 cases were diagnosed cytologically as candidiasis by LBC and 5 by CP. Sensitivity of LBC and CP was 75% and 62.5% respectively. All of these cases had thick curdy white discharge (Table 3 and 5; Figure 2a and 2b).

2 patients came out to be positive for trichomonas on culture. Trophozoites could be seen cytologically in 1 patient each on LBC and CP. Thus, LBC and CP had a sensitivity of 50% each in the detection of Trichomonas vaginalis. Both the patients had presented with greenish yellow discharge (Table 4 and 5; Figure 3a and 3b).

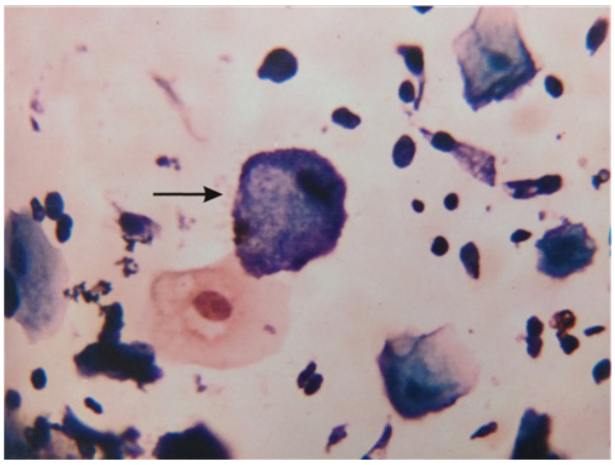

Figure 1(a).LBC smear showing clue cell in bacterial vaginosis (10×40X)

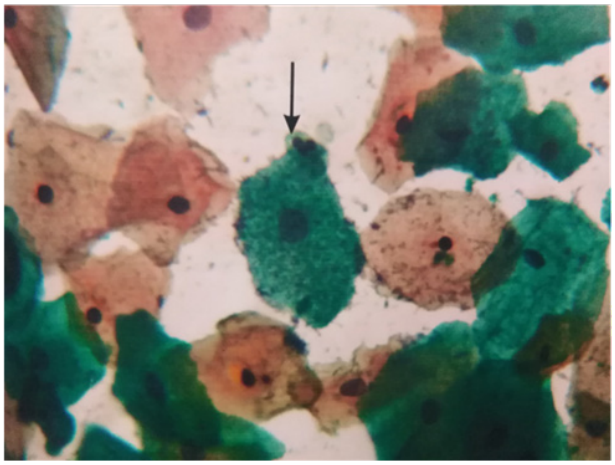

Figure 1(b).CP smear showing clue cell in bacterial vaginosis (10×40X)

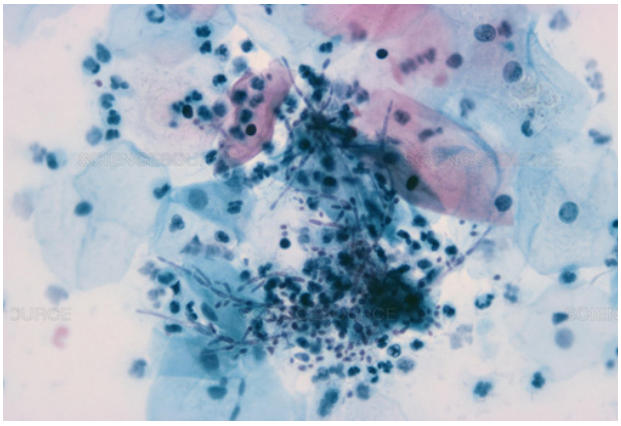

Figure 2(a).LBC smear showing fungal spores and hyphae (10×40X)

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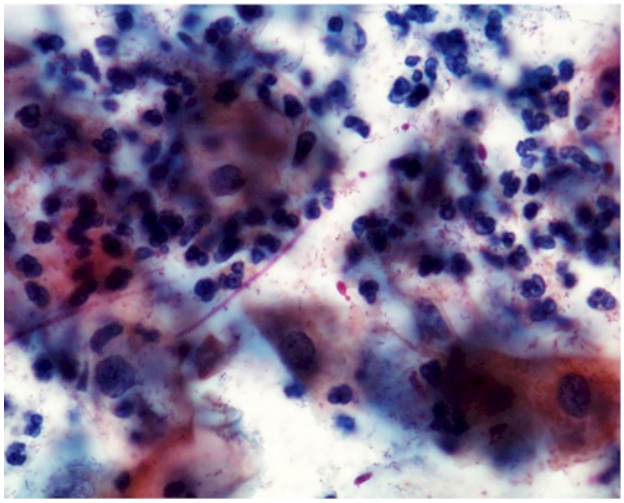

Figure 2(b).CP smear showing fungal spores and hyphae (10×40X)

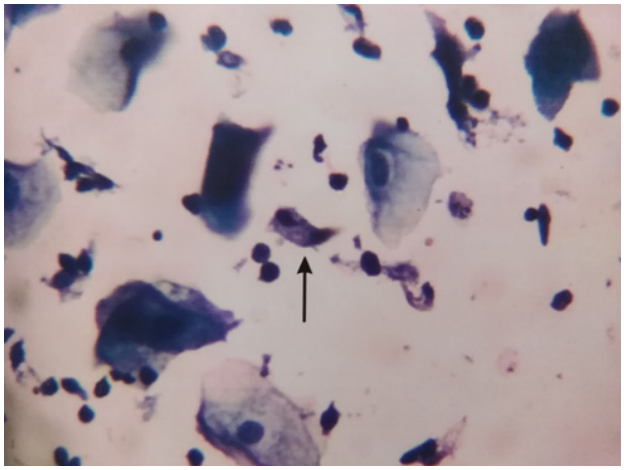

Figure 3(a).LBC smear showing Trophozoite of Trichomonas vaginalis (10×40X)

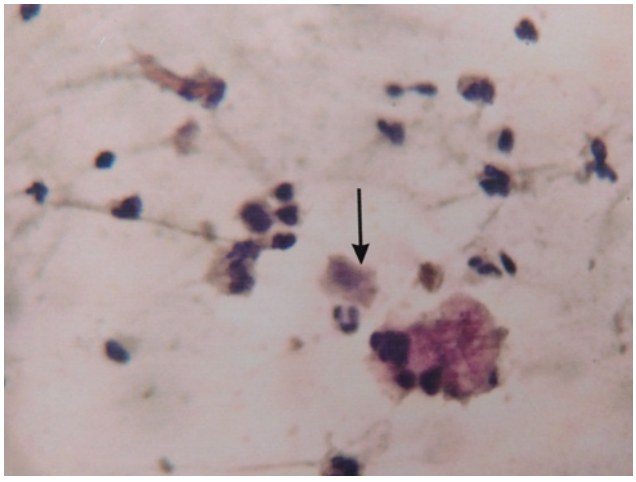

Figure 3(b).CP smear showing Trophozoite of Trichomonas vaginalis (10×40X)

Rest 15 cases were found to have normal cytology and were negative for fungal and trichomonas culture and did not fit in Amsel's criteria for bacterial vaginosis.

Discussion

A total of 40 cases abnormal vaginal discharge presenting with pruritis vulvae were studied from June to December 2015. The Pap smear has been utilized for cervical cancer screening for more than 50 years. Liquid based cytology has been developed to address the sampling problems of conventional Pap smear but it's use in infectious pathology has not been studied extensively.

Patients age ranged from 20-70 years. Majority of the patients (28.75%) belonged to 31-40 years. A total of 80% belonged to the reproductive age group (i.e. 20-50 years). This group of patients are most predisposed to genital tract infections. Sherwani RK et al.[7] also reported majority of the patients in the age group of 21-50 years.

Out of 40 patients of abnormal vaginal discharge, 27 had homogenous greyish white discharge. 15 of such cases were finally diagnosed as bacterial vaginosis using Amsel's criteria. Out of these 15 cases, 13 cases had shift in bacterial flora and clue cells on LBC and 14 on CP. In comparison to LBC, one more case of Bacterial vaginosis was detected on CP. This may be due to partial elimination of bacteria during processing. The sensitivity for the detection of Bacterial vaginosis was 86.6% for LBC and 93.3% for CP. Takei H et al.[8] also found that shift in bacterial flora was detected more on CP than in LBC, which is in concordance with our study.

Thick white curdy discharge was present in 10 patients, out of which candidiasis was finally diagnosed in 8 patients by culture. 6 cases showed candida on LBC and 5 on CP. The sensitivity of LBC for the detection of candidiasis was 75% whereas it was 62.5% on CP. Candida organisms are larger and may not be eliminated by LBC processing. In fact, the final step of sedimentation with LBC processing may provide an increase in concentration of fungal organisms, compared with CP. This may explain why LBC is more effective than CP for the detection of candida organisms. Sherwani RK et al.[7] and Takei H[8] also encountered more cases of candidiasis on LBC than CP. Howell LP et al.[9] also reported a higher rate of infections on LBC than CP although the exact nature of these infections has not been mentioned in their study.

3 patients had presented to us with greenish yellow discharge, out of which 2 cases were finally diagnosed as Trichomonas vaginalis by culture. 1 case was exclusively positive each on LBC and CP. Sensitivity of both the methods were therefore equal i.e. 50%. Hence, we conclude that in our study both the methods were equivalent in detection of Trichomonas vaginalis. Cheung ANY et al.[10] encountered statistically insignificant but a slightly higher rate of Trichomonas vaginalis on CP than LBC. Takei H et al.[8] reported a higher incidence of Trichomonas vaginalis on CP. Our study had only two patients of Trichomonas vaginalis, so no comment on the superiority of any method can made.

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Thus, both LBC & CP diagnosed 20 cases and hence no significant difference was there between these two methods. Cheung et al.[10] had also observed that there was no statistically significant difference between LBC and CP which is in concordance with our study. However, Takei et al.[8] and Howell LP et al.[9] found statistically significant difference between LBC and CP in the detection of specific infection.

In our study, Bacterial vaginosis was the commonest cause of vaginal discharge with pruritis vulvae followed by candidiasis and trichomonas. Takei H[8] also reported Bacterial vaginosis to be the commonest infection.

Conclusion

As our study did not show any significant difference in detection of specific infections by LBC or CP, we hereby conclude that due to its cost effectiveness CP is as good as LBC in detection of specific infections. However, more studies with a larger sample size may be required to validate this.

Conflict of Interest: None

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