

Cytolytic Vaginosis: A Common Yet Underdiagnosed Entity

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Abstract

Objective: The objective of this study is to determine the incidence of cytolytic vaginosis among patients undergoing cervicovaginal cytology for vaginal discharge, pruritus, dyspareunia, and other symptoms. Cytolytic vaginosis is also known as *Lactobacillus* overgrowth syndrome or Doderlein's cytolysis. It is characterized by an abundant growth of *Lactobacilli* resulting in lysis of vaginal epithelial cells. **Methods:** A total of 308 women presented to gynecological outpatient department. All of the patients were subjected to Pap test with the help of cytobrush. The cervicovaginal smears were fixed in methanol, stained with papanicolaou stain, and studied under a microscope independently by two pathologists. **Results:** Of 308 patients, 190 (61.7%) had an inflammatory lesion and were negative for intraepithelial malignancy. Of 190 cases, 31 (16.3%) were diagnosed with cytolytic vaginosis based on the clinical and morphological features. **Conclusion:** Cytolytic vaginosis is a fairly common entity often misdiagnosed as candidiasis. Morphological features play an important role in identifying cytolytic vaginosis. The results of this study may contribute to reports in the literature indicating the importance of cytolytic vaginosis which is not included in the current Bethesda system for reporting of cervical cytology.

Keywords: Bethesda, candidiasis, cytolytic vaginosis, *Lactobacilli*

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INTRODUCTION

Vaginal discharge is one of the most common complaints encountered among women of reproductive age group. Infection with *Candida*, *Trichomonas*, and coccobacilli accounts for the majority of cases with vaginal discharge. Some of the patients presenting with vaginal discharge may be unresponsive to treatment with abovementioned infections. These patients may be suffering from cytolytic vaginosis. Cytolytic vaginosis (CV) is also known as *Lactobacillus* overgrowth syndrome or Doderlein's cytolysis. It is characterized by an abundant growth of *Lactobacilli* resulting in lysis of vaginal epithelial cells; and therefore, called cytolytic vaginosis.^[1] The normal vaginal flora was first described by Doderlein as consisting of acid-producing Gram-positive, immobile, nonspore-forming anaerobes, now referred as *Lactobacillus* species. Healthy women of reproductive age groups are colonized by *Lactobacillus*. It is also suggested that the presence of estrogen and *Lactobacillus* are needed to achieve an optimal vaginal pH of 4.0–4.5. *Lactobacilli* produce lactic acid from glucose, keeping the vagina at an acidic pH. After puberty, glycogen is deposited in the vaginal epithelial cells under the influence of estrogen

which is metabolized by vaginal epithelial cells to glucose. *Lactobacillus* converts glucose to lactic acid.^[2] They occur in abundance in the late luteal phase and in pregnancy, prefer an acid environment, and are common among women using hormonal preparations (contraceptives and replacements) and in the premenarchal and menopausal age groups.^[3] *Lactobacillus* has a protective role also. Some species of *Lactobacillus* produce hydrogen peroxide, which is toxic to various microorganisms. This may prevent overgrowth of organisms such as *Escherichia coli*, *Candida* species, *Gardnerella vaginalis*, and *Mobiluncus* species. According to several studies, *Lactobacilli* builds up a barrier against candida overgrowth by blocking the adhesion of yeast to vaginal epithelial cells through competition for nutrients.^[4]

In health, low number of *Lactobacilli* (five bacilli per ten squamous cells) is considered protective against candidiasis by blocking the adhesion of candida yeast

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cells to vaginal epithelial cells, through competition for nutrients.^[5] Overgrowth of *Lactobacilli* may occur in individuals of reproductive age group by causing dissolution and damage to vaginal intermediate epithelial cells. It has been observed that in the luteal phase, there is a remarkable rise in the number of colonizing *Lactobacilli*. It has been claimed that *Lactobacilli* are more abundant in women with diabetes mellitus.^[2]

The entity is included in the current Bethesda system for reporting cervical cytology, as “unsatisfactory for evaluation.” In these cases, the reason for “unsatisfactory smears” should be mentioned in the report. Awareness about this entity and its characteristic morphological features is necessary to avoid suffering and unnecessary medication of patients.

METHODS

A total of 308 cases of cervical smears over a period of 1 year were received at our clinical laboratory from the gynecology outpatient department. The cervical smears were prepared using cytobrush. All smears were fixed in methanol, stained with papanicolaou stain, and examined independently by two pathologists.

RESULTS

Of 308 cases of cervical smears, 190 were inflammatory (61.7%). Out of inflammatory cases, 31 were of cytolytic vaginosis (16.3%). The most common presenting symptoms in patients with cytolytic vaginosis were increased vaginal discharge and pruritus vulva. The age groups ranged from 24 to 61 years, with a median age being 39 years. The parity of patients ranged from P0+0 to P6+0. Of 31, 19 (61%) were in the luteal phase and this finding corroborates with the literature.^[6] The colposcopic findings ranged from cervical erosion, vaginitis, vulvitis, and discharge [Table 1]. The cytological findings were increased in the number of *Lactobacilli*, a paucity of white blood cells, the presence of cytolysis, stripped or naked nuclei, and the absence of fungus,

coccobacilli, or *Trichomonas* [Figures 1 and 2]. Based on the clinical and cytological features, these cases were diagnosed as cytolytic vaginosis with advise to repeat cervical smears after treatment.

DISCUSSION

Cytolytic vaginalis presents clinically with vaginal discharge, pruritus, dyspareunia, and vulvar dysuria. Cyclical increase in symptoms is observed in the luteal phase. CV is characterized by vaginal pH between 3.5 and 4.5. Microscopically, the papanicolaou-stained cervicovaginal smears show abundant *Lactobacilli*, paucity of pus/polymorphonuclear cells, bare/naked nuclei, cytoplasmic fragments, and the absence of fungal spores/hyphae, coccobacilli, or *Trichomonas*. The microscopic features of CV are based on a study conducted by Hu *et al.* to observe the morphological characteristic of vaginal discharge in patients with CV under the microscope.^[6] The clinical features of CV are similar to vulvovaginal candidiasis (VVC); thus, it is important to exclude candidiasis by investigations. CV can be distinguished from bacterial vaginosis (BV) by pH measurement and whiff test. The pH in the case of BV is more than 4.5 and the Schiff test is also positive. The large number of *Lactobacilli* covering squamous cells can mimic clue cells seen in BV; however, it can be distinguished by careful examination. The key points of differentiation between CV, candidiasis, and BV are tabulated in Table 2.

CV is not an uncommon condition; however, it is often misdiagnosed because it is confused with candidiasis. Many practitioners rely on their clinical judgment alone rather than investigations. Compounding the problem of misdiagnosis is that patients assume that their symptoms are caused by a yeast infection, which results in telephone requests for medication from their physicians instead of an office consultation.^[7] Cerikcioglu and Beksac in their study of 210 women with vaginal discharge and other symptoms/signs of genital pathology, suggestive of VVC, observed that fifteen patients (7.1%) were diagnosed with CV. All of these cases were in the reproductive age groups of 25–40 years and five were in the luteal phase, with enhanced complaints of discharge

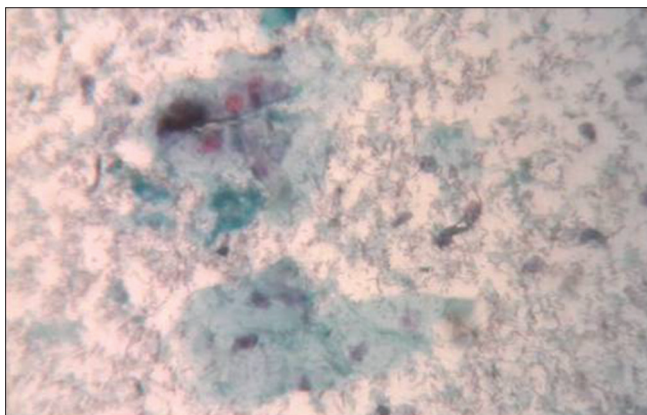


Figure 1: Cervical smear showing cytolysis of squamous cells in the background full of *Lactobacilli* (×40, Papanicolaou)

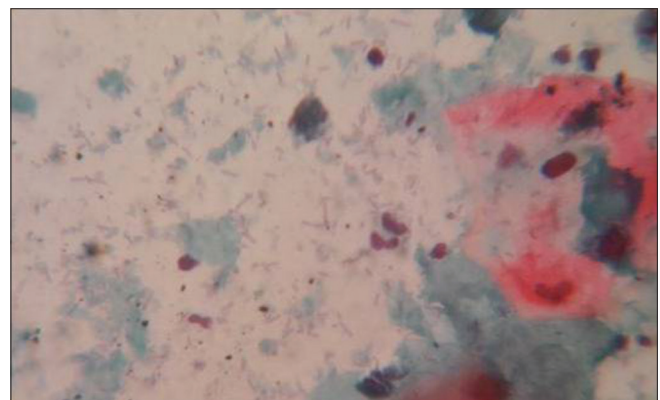


Figure 2: Cervical smear showing cytoplasmic debris, bare nuclei, and abundant *Lactobacilli* in the background (×40, Papanicolaou)

Table 1: Clinical findings in patients of cytolytic vaginosis

Age	Chief complaint	Parity	Time of cycle	Per speculum findings
47	Increased vaginal discharge	P3+0	Follicular phase	Cervix and vagina inflamed, small anterior lip polyp
56	Increased vaginal discharge, pruritus vulva	P3+0	Menopausal	Inflamed vagina, discharge
32	Increased vaginal discharge	P2+0	Follicular phase	Inflamed vagina, discharge
38	Increased vaginal discharge	P2+0	Luteal phase	Inflamed vagina, mixed discharge
31	Increased vaginal discharge	P0+A0	Luteal phase	Cervix healthy, mixed discharge
31	Increased vaginal discharge, pruritus vulva	P2+0	Follicular phase	Inflamed vulva, thin discharge
31	Pruritus vulva, increased vaginal discharge	P0+0	Follicular phase	Inflamed vulva and vagina, mixed discharge
24	Increased vaginal discharge, foul-smelling	P0+0	Luteal phase	Inflamed vagina, foul discharge
43	Increased vaginal discharge	P2+0	Luteal phase	Inflamed vagina, mixed discharge
26	Increased vaginal discharge	P1+0	Follicular phase	Cervical erosion, mixed discharge
43	Increased vaginal discharge	P2+0	Luteal phase	Cervical erosion, mixed discharge
38	Increased vaginal discharge	P1+0	Luteal phase	Cervical erosion, mixed discharge
32	Increased vaginal discharge	P2+0	Luteal phase	Cervical erosion, mixed discharge
38	Increased vaginal discharge, pruritus vulva	P2+0	Follicular phase	Inflamed vulva and vagina, thick discharge
40	Increased vaginal discharge	P2+0	Follicular phase	Thick discharge
40	Increased vaginal discharge	P2+0	Luteal phase	
61	Pruritus vulva, urge incontinence	P2+0	Luteal phase	Cervix and vagina normal, discharge
30	Increased vaginal discharge	P6+0	Follicular phase	Cervix, vagina normal, mixed discharge
37	Increased vaginal discharge		Luteal phase	Cervical erosion, mixed discharge
30	Increased vaginal discharge	P2+0	Luteal phase	Cervix and vagina congested, foul-smelling discharge
40	Increased vaginal discharge	P2+0	Luteal phase	
30	Increased vaginal discharge	P1+0	Follicular phase	Circumferential erosion, mixed discharge
30	Increased vaginal discharge	P0+0	Follicular phase	Cervix and vagina inflamed, Discharge
46	Foul-smelling discharge	P2+0	Follicular phase	Inflamed cervix, mixed discharge
36	Increased vaginal discharge	P2+0	Luteal phase	Inflamed cervix, vagina congested, mixed discharge
21	Increased vaginal discharge	P0+2	Luteal phase	Inflamed cervix and vagina, mixed discharge
47	Increased vaginal discharge	P2+0	Luteal phase	Cervix, vagina congested, mixed discharge
31	Increased vaginal discharge	P2+0	Luteal phase	Cervical erosion
48	Pruritus vulva		Luteal phase	Inflamed cervix and vagina, mixed discharge
49	Increased vaginal discharge	P3+0	Luteal phase	Cervix and vagina normal
52	Menorrhagia, increased vaginal discharge	P2+0	Luteal phase	Cervix and vagina healthy, mixed discharge

Table 2: Comparative investigatory findings in cytolytic vaginosis, candidiasis, and bacterial vaginosis

Parameter	CV	Vulvovaginal candidiasis	BV
pH	3.5–4.5	<5	>4.5
Whiff test	Negative	Negative	Positive
Microscopy			
Lactobacilli	Abundant	Not increased	Few/absent
Pus cells	Few	Abundant	Few
Coccobacilli	Absent	Absent	Abundant
Clue cells	False clue cells	Absent	Present
Bare/naked nuclei	Present	Absent/few	Absent/few
Cytolysis	Present	Absent	Absent
Fungal spores/hyphae	Absent	Present	Absent
Culture	No growth	Fungal growth of sabouraud dextrose agar	Bacterial growth on aerobic culture medium

BV: Bacterial vaginosis, CV: Cytolytic vaginosis

and pruritus.^[1] In another study conducted by Demirezen to detect the rate of CV in patients with symptoms resembling that of candidiasis and to distinguish them from candidiasis cases by examining of 2947 papanicolaou stained cervicovaginal smears. Fifty-four of 2947 patients (1.83%) were diagnosed as having CV based on cytological/morphological criteria.^[8]

The treatment of CV is directed toward reducing the number of *Lactobacilli* by elevating vaginal pH. The vaginal pH is elevated by douching with sodium bicarbonate solution or suppository vaginally. Douches are carried out twice weekly for every 2 weeks. Douching solution is prepared by mixing 1–2 tablespoons of baking soda with four cups of warm water. A suppository is

prepared by filling gelatin capsules with baking soda. Elevating vaginal pH resolves the symptoms by restoring the normal vaginal environment. If symptoms persist or worsen beyond 2–3 weeks after initiating treatment, reevaluation is required.^[2]

CONCLUSION

The study emphasizes the need for the correct diagnosis of vaginal discharge wherein CV should be considered as a possible culprit. It is not as common as candidiasis or BV; however, it is sometimes confused with the former. A misdiagnosis can lead to patient suffering and unnecessary medication for other causes. Morphological features play an important role in identifying the possible cause of the vaginal discharge and cervicovaginal smears should be studied for all patients with vaginal discharge. The results of this study may contribute to reports in the literature indicating the importance of CV which is included in the current system for reporting of cervical cytology under “unsatisfactory for evaluation.” The reason for “unsatisfactory smears” should be mentioned in the report so that these patients can be treated correctly.

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Conflicts of interest

There are no conflicts of interest.

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