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Research Article

## Evaluation of Risk Factors in Patients with Recurrent Vaginal Discharge Complaints and Comparison of Gardnerella Cases

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### A B S T R A C T

The present study aimed to evaluate the clinical and microbiological aspects of cases presenting with complaints of recurrent vaginal discharge and to compare cases of bacterial vaginosis caused by *gardnerella* with other cases. The study included 258 patients who presented to our hospital's gynecology clinics with complaints of vaginal discharge between May 2018 and November 2024. Patient complaints and vaginal culture results were obtained from hospital records. The mean age of the patients was  $39.4 \pm 7.9$ . The most common complaints were discharge (189 patients; 73.3%), itching (47 patients; 18.2%) and vaginal burning (37 patients; 14.3%). No agent was detected in 46.5% of vaginal cultures and were evaluated as normal vaginal flora. *Candida* species were seen in 97 (37.6%) of the cultures and *gardnerella vaginalis* was seen in 20 (7.8%). No significant difference was found in the distribution of complaints between the patients with *G. vaginalis* growth and the group with other agents ( $p > 0.05$  for each). No significant difference was found in the mean age, parity and gravida between the patients with *G. vaginalis* growth and the group with other agents ( $p > 0.05$  for each). The findings obtained from the present study show that the most common agent in patients presenting with a preliminary diagnosis of vaginitis was *gardnerella* species and the differential diagnosis of bacterial vaginosis caused by *gardnerella* was based on the distribution of complaints, age and pregnancy number does not provide significant information.

**Keywords:** Vaginitis, *Candida* and *Gardnerella vaginalis*.

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### 1. Introduction

Vaginitis, which is the inflammatory process of the vagina, affects 15-40% of all women. In the prepubertal period, the presence of an acidic environment and the immune system prevent the proliferation of pathogenic bacteria. Lactobacilli constitute 95% of the flora. The normal flora of the genital system is dominated by diphtheroids and coagulase-negative staphylococci in the prepubertal period. Lactobacilli settle in the environment during puberty<sup>1-3</sup>. - Diphtheroids, *gardnerella*

*vaginalis*, anaerobic streptococci, *streptococcus agalactiae*, *enterococcus* spp., coagulase-negative staphylococci, *staphylococcus aureus*, *escherichia coli*, *mycoplasma*, *ureaplasma* and yeasts can be found in the normal vaginal flora. In postmenopausal women, lactobacilli decrease, the number of enteric bacteria increases and fungi and *mycoplasma* are not found<sup>4-6</sup>. Physiological vaginal discharge is seen during puberty. It consists of cervical mucus, shed vaginal epithelial cells and lactobacilli. It is odorless, colorless or milky white in appearance and adheres to the vaginal walls. It does not cause itching or

irritation. It is affected by the phases of the menstrual cycle. The decrease in the number of lactobacilli over time and the increase in the number of *G. vaginalis*, mycoplasma, *Atopobium vaginalis* and *Bacteroides vaginalis* in the flora play a role in the pathogenesis of vaginitis<sup>1-4</sup>. After puberty, especially with the onset of sexual activity, bacterial agents (40-45%), *Candida* species (25%) and *Trichomonas vaginalis* (20%) are frequently seen in vaginal infections that develop due to some reasons such as multiple sexual partners, not using condoms and frequent vaginal douching<sup>5-8</sup>. The complaints of patients when they apply to the clinic are generally vaginal discharge, odor, burning in the vagina, irritation and itching. If the treatment is not directed at the pathogen, the lives of the individuals are affected, the complaints last for a long time and various complications such as salpingitis and infertility may be encountered. Appropriate, correct and sufficient treatment is possible with the correct diagnosis. For this purpose, the patient's clinic (according to Amsel criteria), anamnesis and laboratory findings should be evaluated together<sup>9-11</sup>. Microbiological and biochemical examinations play an important role in the diagnosis of vaginitis. The duration of the disease is prolonged in cases where treatment is not directed at the causative agent<sup>8-11</sup>. The present study aimed to evaluate the clinical and microbiological aspects of the cases presenting with the complaint of recurrent vaginal discharge and to compare the cases of bacterial vaginosis caused by *Gardnerella* with other cases.

## 2. Material and Methods

### 2.1. Patient population

The study included 258 patients who applied to our hospital's gynecology clinics with complaints of vaginal discharge between May 2018 and November 2024. Our secondary care hospital is a 75-bed health center serving an urban and rural area with a population of approximately 900,000.

The demographic characteristics of the patients, the time of onset of symptoms, the most common complaints, microscopic examination and vaginal culture results were evaluated retrospectively.

### 2.2. Cultures

Vaginal swab samples were taken from all patients with complaints of vaginal discharge under sterile conditions and sent to the laboratory. The samples brought to the laboratory were cultured using standard methods. The samples were evaluated after 24 hours. The MALDI-TOF (bioMérieux, France) automated system was used to identify the bacteria that grew.

### 2.3. Statistical analysis

The sample size in the study was calculated with power analysis using G-Power (version 3.1.9.6, Franz Faul, Universitat Kiel, Germany). The effect size was taken as 0.39, type 1 error as 0.05 and test power as 0.95 and the total required sample size was determined as at least 132.

**Table 4:** Comparison of some mean values of patients with growth of *Gardnerella vaginalis* in vaginal culture and other patients.

	<i>Gardnerella vaginalis</i> (n=20)		Others		General	p	
	Mean	SD	Mean	SD	Mean		
Age (years)	39.3	12.2	39.4	7.5	39.4	7.9	0.398
Gravity	2.2	2.3	2.4	1.8	2.4	1.9	0.179
Parity	1.6	2.0	1.8	1.5	1.8	1.5	0.056

Mann-Whitney U test was used. SD: Standard deviation.

All statistical analyses in the study were performed using SPSS 25.0 software (IBM SPSS, Chicago, IL, USA). Descriptive data were given as numbers and percentages. Comparisons between groups in terms of categorical variables were made with Pearson's Chi Square test. Whether continuous variables were normally distributed was analyzed with the Kolmogorov-Smirnov Test. Differences between two groups in terms of continuous variables that were not normally distributed were analyzed with the Mann Whitney U test. The results were evaluated at a 95% confidence interval and  $p < 0.05$  values were considered significant.

## 3. Results

The mean age of the patients was  $39.4 \pm 7.9$  years. The most common complaints were discharge (189 patients; 73.3%), itching (47 patients; 18.2%) and burning (37 patient; 14.3%) (**Table 1**). No agent was detected in 46.5% of the vaginal cultures and were evaluated as normal vaginal flora. *Candida* species were seen in 97 (37.6%) of the cultures and *Gardnerella vaginalis* in 20 (7.8%) (**Table 2**). No significant difference was found in the distribution of complaints between the patients with *G. vaginalis* growth and the group with other agents ( $p > 0.05$  for each) (**Table 3**). No significant difference was found between the patients with *G. vaginalis* growth and the group with other agents in terms of mean age, parity and gravida ( $p > 0.05$  for each) (**Table 4**).

**Table 1:** Distribution of complaints (n=258).

	n	%
Discharge	189	73.3
Itching	47	18.2
Burning	37	14.3
Pain	13	5.0
Odor	9	3.5

**Table 2:** Distribution of vaginal culture results.

	n	%
<i>Candida</i> spp.	97	37.6
<i>Gardnerella vaginalis</i>	20	7.8
<i>Escherichia coli</i>	17	6.6
<i>Trichomonas vaginalis</i>	4	1.6
Normal vaginal flora	120	46.5
Total	258	100

**Table 3:** Comparison of complaints between patients with growth of *Gardnerella vaginalis* in vaginal culture and other patients.

	<i>Gardnerella vaginalis</i> (n=20)		Others		p
	n	%	n	%	
Discharge	16	80.0	173	72.7	0.478
Itching	4	20.0	43	18.1	0.83
Burning	4	20.0	33	13.9	0.452
Pain	1	5.0	12	5.0	0.993
Odor	1	5.0	8	3.4	0.701

Chi square test was used.

#### 4. Discussion

Nowadays, recurrent vaginal discharge has become a common problem affecting women's health. This condition may occur due to the interaction of many factors and therefore, the evaluation of risk factors for recurrent vaginal discharge is of great importance in terms of developing accurate diagnosis and effective treatment strategies<sup>5-7</sup>. In this study, some distinguishing factors regarding the causative agent in women with pre-diagnosis of recurrent vaginitis were examined. The distribution of causative microorganisms in vaginitis cases varies according to age, the region where the study was conducted and the population<sup>4-7</sup>. In the study conducted by Kaymak et al<sup>12</sup>, normal vaginal flora was grown in 36% of the vaginal cultures and in the study conducted by Duran et al<sup>13</sup>, normal vaginal flora was grown in 59% of the samples and the vaginitis agent could not be detected. Similarly, in the present study, no agent was detected in 46.5% of the vaginal cultures and they were evaluated as normal vaginal flora. These findings show that the agent may not be detected by culture in approximately one-third of the vaginal cultures of patients presenting with a pre-diagnosis of recurrent vaginitis. Kaymak et al<sup>12</sup> reported that the most common pathogens in which growth was detected were candida species at a rate of 42% and gardnerella at a rate of 9%. Celik et al<sup>14</sup> found that gardnerella was the most common pathogen in cervicovaginal pap smear screenings. Kesli et al<sup>15</sup> and Duran et al<sup>13</sup> found G. vaginalis growth in 13% of patients with suspected vaginitis in their studies. Tosun et al<sup>16</sup> reported the G. vaginalis detection rate as 23% in patients with suspected vaginitis. In the present study, candida species growth was seen in 37.6% of the cultures and gardnerella vaginalis growth was seen in 7.8%. In addition, escherichia coli and trichomonas vaginalis growth was detected less frequently. These findings show that candida species are dominant in recurrent vaginitis, but gardnerella causes vaginitis to a significant extent. Kaymak et al<sup>12</sup> and Celik et al<sup>14</sup> found no difference in mean age between the groups they studied according to the vaginitis agents. Ortayli et al<sup>17</sup> found the mean age to be similar between patients diagnosed with bacterial vaginosis and the control group without vaginitis. In the present study, no significant difference was found in mean age between patients with G. vaginalis growth and the group with other agents. These findings show that cases of bacterial vaginosis caused by gardnerella are seen at similar ages to other vaginitis cases and that patient age is not a determinant in the differential diagnosis.

It has been reported that the most common complaints in vaginitis cases are discharge, burning and odor from the genital area<sup>9-13</sup>. Ortayli et al<sup>17</sup> found that the rate of patients with discharge or odor complaints in patients diagnosed with bacterial vaginosis was significantly higher than in the control group not diagnosed with vaginitis. Kaymak et al<sup>12</sup> reported that there was no difference in the distribution of complaints according to the vaginitis agents. In the present study, it was determined that the most common complaints at presentation were discharge (73.3%), itching (18.2%) and burning (14.3%), with lower rates of pain and odor complaints. As expected, these findings show that discharge is the most prominent complaint in patients presenting with a preliminary diagnosis of vaginitis. In addition, no significant difference was found in the distribution of complaints between patients in whom G. vaginalis grew and the group in whom other agents grew. These findings indicate that complaints in patients presenting with a preliminary

diagnosis of recurrent vaginitis may not contribute significantly to the differential diagnosis of bacterial vaginosis caused by gardnerella.

Ortayli et al<sup>17</sup> found that the mean gravida and parity numbers were similar between patients with bacterial vaginosis and the control group without vaginitis. In the present study, no significant difference was found in terms of mean parity and gravida between patients with G. vaginalis growth and the group with other factors. This finding shows that the number of pregnancies or births is not directly related to the factor causing recurrent vaginitis.

Some limitations of the present study include the fact that the number of patients with gardnerella-caused vaginitis was not very high but we consider that this situation may affected the statistical analysis minimally.

The findings obtained from the present study show that the most common factor in patients presenting with a preliminary diagnosis of recurrent vaginitis was candida species and that the distribution of complaints, age and number of pregnancies do not provide important information in the differential diagnosis of bacterial vaginosis caused by gardnerella. If the patient does not get better despite the usual treatment of vaginitis and frequently relapses, treatment should be planned according to the vaginal culture result. This sentence is not compatible with the content of this study. Therefore, we would like to remove this sentence.

#### Conflict of interests

None to declare.

#### Funding

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