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Studying the Possible Factors Influencing the Physical Characteristics of Abnormal Vaginal Discharge and Their Correlation with the Type of Pathogens

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ABSTRACT

Background/aims: Abnormal vaginal discharge is a frequent conditions females at different age groups. It presents with variable physical characteristics and could be attributed to several conditions.The aim of this study is to assess the possible correlation between physical characteristics of vaginal discharge with the type of microbial infection.

Methods: The study was conducted from March 2023 to April 2024. All patients were attendents to Al-Kafeel Specialized Hospital or Obstetrics and Gynecology Teaching Hospital in Kerbala, or private consultation clinics. Kerbala, Iraq. All patients had abnormal vaginal discharges and two high vaginal swabs (HVS) were collected during colposcopy by Gynecologist.The first swab was used for amsel's criteria.The Second Swab was used for microbial culture. Demographic data and the physical characteristics of the discharges were recorded using a specific form (some by personalinterview and others by electronic communications).

Results: Out of 244patient's complained of vaginal discharge. 238(97.5%) had positive culture. majority (49.6%) of them were falling in the age range (26 -35) years, About 96.2% were married and most (73.1%)are education (university or secondary), in most cases (58.4%) the discharge was mucoid and sticky.foul odor was reported in most of cases (59.7%).The most common color 156 out 238, (65.5%) of vaginal discharge was white.The prevalence of AV, BV and VVC among women was (84.8%), (1.68%), (28.57%), respectively.

Conclusion: Aerobic vaginitis (AV) andvulvovaginal candidiasis (VVC) are the common causes of vaginitis in Iraqi women.

Keywords: aerobic vaginitis, bacterial vaginosis, vulvovaginal candidiasis, abnormal vaginal discharge.

INTRODUCTION

Women in the reproductive age range frequently have abnormal vaginal discharge, which has a variety of etiologies. Abnormal vaginal discharge is the second most frequent issue, after menstrual problems [1]. Over the course of a year, about 1 in 10 women will have vaginal discharge [2][3]. Many women who experience vaginal discharge mistreat their condition by taking over-the-counter medications [4]. If the right laboratory tests are not performed at the right time, medical professionals themselves are at risk of making an incorrect diagnosis Physiological vaginal discharge alters with the menstrual cycle with the discharges being clearly pliable in consistency around ovulation and then becoming heavy and mild yellow during the luteal phase. Normal vaginal discharges are not associated with symptoms such as itching, redness and swelling, nor have an odour. An increased amount of discharge is seen during elevated oestrogen states such as ovulation, the luteal phase, puberty and pregnancy. Oestrogen-based therapies that combine hormonal contraception and hormone-replacement therapies also play a major role.Vaginitis is one of the most common conditions among reproductive aged women, which is characterized by symptoms of abnormal vaginal discharge, malodor, itching and/or burning sensations [5]. The healthy vaginal tract of reproductive aged women contain a complex microbial environment comprising of different species in variable quantities mainly *Lactobacillus spp*. which maintains a healthy and safe microenvironment [6]. Distortion in this balance leads to urogenital infections, including different types of vaginitis viz., AV, BV, TV and VVC [7].The symptoms associated with pathological discharge include dyspareunia, a burning feeling, itching, and aberrant odor. The treatment of vaginal discharge frequently employs a syndromic strategy. The primary drawback of this strategy is an incorrect diagnosis and irrational use of numerous antimicrobials, which results in the emergence of drug-resistant strains that places a financial burden on the patient [8]. Simple laboratory procedures, such as Gram staining, wet mount, smell tests,

and the use of direct microscopy can aid in identifying the etiological agent and defining the proper course of treatment thus preventing complications. Bacterial vaginosis, trichomoniasis and vulvovaginal candidiasis [9] are the three main etiological factors causing abnormal vaginal discharge.

In addition to the infectious causes, abnormal vaginal discharge could be initiated by non-infectious cases.For instance,foreign body, malignancy, contact dermatitis, or other mechanical or chemical irritation [10].Intrauterine contraceptive device can also cause vaginal discharge related to chronic irritant cervicitis or endometritis. The main sign of bacterial vaginosis (BV) is an offensive malodorous discharge. The proliferation of many facultative and anaerobic bacterial species is the main cause of it, which is prevalent in women who have multiple sex partners [11][12]. Different forms of infections can be distinguished by the characteristics of aberrant vaginal discharge, such as its frequency, color, consistency, smell, and presence or absence of itching. Fever, pelvic soreness, and pelvic discomfort are warning signs of pelvic inflammatory disease [13].

MATERIAL AND METHODS

Study Design and Ethical Consideration

This study was a cross-sectional descriptive study, conducted from March 2023 to April 2024. All patients were attendents to Al-Kafeel Specialized Hospital or Obstetrics and Gynecology Teaching Hospital in Kerbala, or private consultation clinics. Kerbala, Iraq.

Data Collection

The sample size was calculated using the single proportion sample size determination formula, which resulted in a total required sample size of 292 [13]. Data (n=238) was collected using a questionnaire that was designed to collect clinical symptoms, socio-demographic characteristics, routine hygienic practices and contraceptive usage through face-to-face interview.

Sample Collection from Patients

After an initial physical assessment,high vaginal swabs taken from female patients complaining of abnormal vaginal discharge. BV was diagnosed by clinical composite criteria and by gram stain. Anaerobes were isolated and identified from the discharge. A routine gynecologic speculum examination was performed on each patient and a medical history was taken. Vaginal secretions were collected using two vaginal swabs from each patient and transported to the laboratory. The first swab was used for amsel's criteria (clue cells, wife test and pH)[14] .While recording thedischarge color, consistency and odor of vaginal discharge were also reported. The pH of vaginal discharge was measured directly by placing indicator paper for pH range of 1.0-14.0 on the vaginal wall. An Amine test was performed. From one swab, wet mount preparation and smears for Gram staining were prepared, which were examined for the presence of clue cells. Gram stain smears were read for morph typing and scoring patterns according to Nugent criteria[15]. The Second Swab was used for microbial culture in 3 ml of sterile thioglycollate broth for anaerobic culture, the anaerobic jars (CO_2 Jar) with use Gas generating kit.

Data Analysis

Data analysis was performed using SPSS version 23 (SPSS Inc, Chicago, Illinois, USA). The Chi square test was used to compare between different groups, whereas Pearson's correlation coefficient was used to find out if positive or negative correlation could be found between the studied variables. P value less than or equal to 0.05 considered as statistical significant for all analyses.

RESULTS

Patient characteristics a total of 244 patients were enrolled in this study. Most (238) of them had positive culture, with an infection rate of (97.5%).

Out of 238 patients, 208(87.39%) patients had a score of ≥ 07 score, 30 (12.6%) had an intermediate score of 4-6. The patients scoring high and intermediate were defined as vaginitis-positive.

Table 1: Patients' characteristics

Characteristics		Frequency n=238(%)
Age(Years)	15-25	35(14.7)
	26-35	118(49.6)
	36-45	53(22.3)
	46-55	32(13.4)
Marital status	Married	229(96.2)
	Single	3(1.3)
	Widow	4(1.7)
	Divorced	2(0.8)

Education	Secondary\University		174(73.1)
	Elementary\Intermediate		54(22.68)
	Illiterate		10(4.2)
Patients occupation	Employed		115((48.3)
	Unemployed		113(47.5)
	Student		10(4.2)
Menstruation	Paused \stopped		70(29.41)
	Continued		117(49.15)
Sports activity		Yes	32(13.4)
		No	206(86.6)
Fast food		Yes	130(54.6)
		No	108(45.4)
Multiple partners		Yes	24(10.1)
		No	214(899)
Smoking>10/d		Yes	8(3.4)
		No	230(96.6)
Currently sexually active		Yes	181(76.1)
		No	57(23.9)
History suggestive of sexually transmitted problem		Yes	148(62.2)
		No	90(37.8)
Previous history of bacterial vaginitis or fungal infection		Yes	112(47.1)
		No	126(52.9)
Children		Yes	194(81.5)
		No	44(18.5)
Currently pregnant		Yes	34(14.3)
		No	202(85.7)
Currently has UTI		Yes	164(68.9)
		No	74(31.1)
Taken treatment for excessive vaginal discharge		Yes	154(64.7)
		No	84(35.3)

Table 1 shows the demographic characteristics of the patients with vaginal discharge. The majority of patients with vaginal discharge were (26 -35) years, constituting 49.6% of the total, indicating that most of the study participants are young and middle-aged adults. This may suggest that vaginal discharge is more likely to occur at ages associated with frequent hormonal changes (represented by the menstrual cycle), increased sexual activity, and/or pregnancy. About 96.2%, are married. In contrast, the percentages of single, widowed and divorced are considered small, the education levels distributed in the group reflect the presence of a large percentage of individuals with a secondary\university education, at 73.1%. While individuals with aelementary\intermediate education or less represent smaller percentages, In terms of occupation, we find that a large percentage of individuals, reaching 48.3%, are employed, while unemployed occupy 47.5% of the sample. We found that the number of women who reported that menstruation had stopped was 70 people, which represents about 29.41% of the total participants, and menstruation continued in 117 people, which represents 49.15% of the participants. The data shows that there is a low percentage of individuals Sports activity, with only 32 individuals (13.4%). In contrast, we find that 54.6% of the participants eat fast food, which may indicate an unhealthy diet. There was also a 10.1% rate of having multiple partners, in addition to 4.3% of smokers who exceed 10 cigarettes per day. In terms of sexual activity, we find that 76.1% of individuals are sexually active. However, there is a significant concern about sexually transmitted infections, with 62.2% of the participant's history suggestive of a sexually transmitted problem. The results also showed that 47.1% of individuals had previous history with conditions such as bacterial or yeast infections. In addition, a large percentage, 68.9%, currently has urinary tract infections, and 34(14.3%)were currently pregnant. regarding the presence of children, a significant majority, (81.5%) reported having children, while only (18.5%) percent indicated that they do not. when examining treatment for excessive vaginal discharge,(64.7%) of individuals indicated that they have sought treatment, while (35.3%) have not. This indicates a notable level of concern regarding this condition among the respondents.

Table 2: Distribution of the symptoms associated with abnormal vaginal discharge.

Sign and symptoms		Frequency n=238(%)
Color of Vaginal Discharges	White	156(65.5)
	Yellow	56(23.5)
	Green	13(5.5)
	Clear	6(2.5)
	Brown	7(2.9)
Consistency of Vaginal Discharge	Mucoid (sticky)	139(58.4)
	Thick white	59(24.8)
	Frothy	24(10.1)
	Butter	16(6.7)
Odor of Vaginal Discharges	Fishy odor	17(7.1)
	Offensive	142(59.7)
	None offensive	30(12.6)
	Others(like dough)	36(15.1)
	No odor	13(5.5)
Duration of Vaginal Discharge	Acute	46(19.3)
	Chronic	140(58.8)
	Recurrent	52(21.8)
Symptoms appear with vaginal discharge (YES)	Pain at intercourse	97 (40.8)
	Lower abdominal pain	144(60.5)
	Burning sensation	142(59.7)
	Itchiness and scratching	134(56.3)
	Vaginal soreness	83(34.9)
	Vaginal dryness	31(13.0)
	Dysuria	22(9.2)
	Inter menstrual bleeding	3(1.3)
	Other	6(2.5)

Data on signs and symptoms associated with the vaginal discharges (such as burning at urination, Itchiness and scratching in the genital area, Lower abdominal pain, Pain at intercourse) and physical appearance of the discharge (color, Consistency, Odor) in Table 2. The results of the table show that the most common color of vaginal discharge is white, with 156 cases recorded, representing (65.5%) of the total, while clear discharge was less common, with (2.5%).Regarding the consistency of the discharge, the results indicated that most of it was sticky, with mucous discharge accounting for (58.4%), while butter discharge was less common, with (6.7%).As for the odor of the discharge, the most common was an offensive odor, with 142 cases (59.7%) recorded. In contrast, non- offensive odors were present in (12.6%) of cases, while other odors were present in (15.1%) of cases.The results also provided information on the duration of vaginal discharge, with chronic discharge being the most common, accounting for 140 cases(58.8%). This was followed by recurrent discharge in (21.8%), while acute discharge was present in 19.3% of cases.When considering other symptoms associated with vaginal discharge, Lower abdominal pain was the most commonly reported symptom, affecting 60.5% of individuals, followed closely by a burning sensation (59.7%) and itchiness or scratching (56.3%). Pain during intercourse was also relatively frequent, occurring in 40.8% of cases. Vaginal soreness was reported by 34.9% of individuals, while less common symptoms included vaginal dryness (13.0%) and dysuria (painful urination), reported by 9.2%. Rarely, inter-menstrual bleeding was noted, affecting only 1.3% of individuals. Interestingly, 2.5% of the population reported no symptoms despite experiencing vaginal discharge.

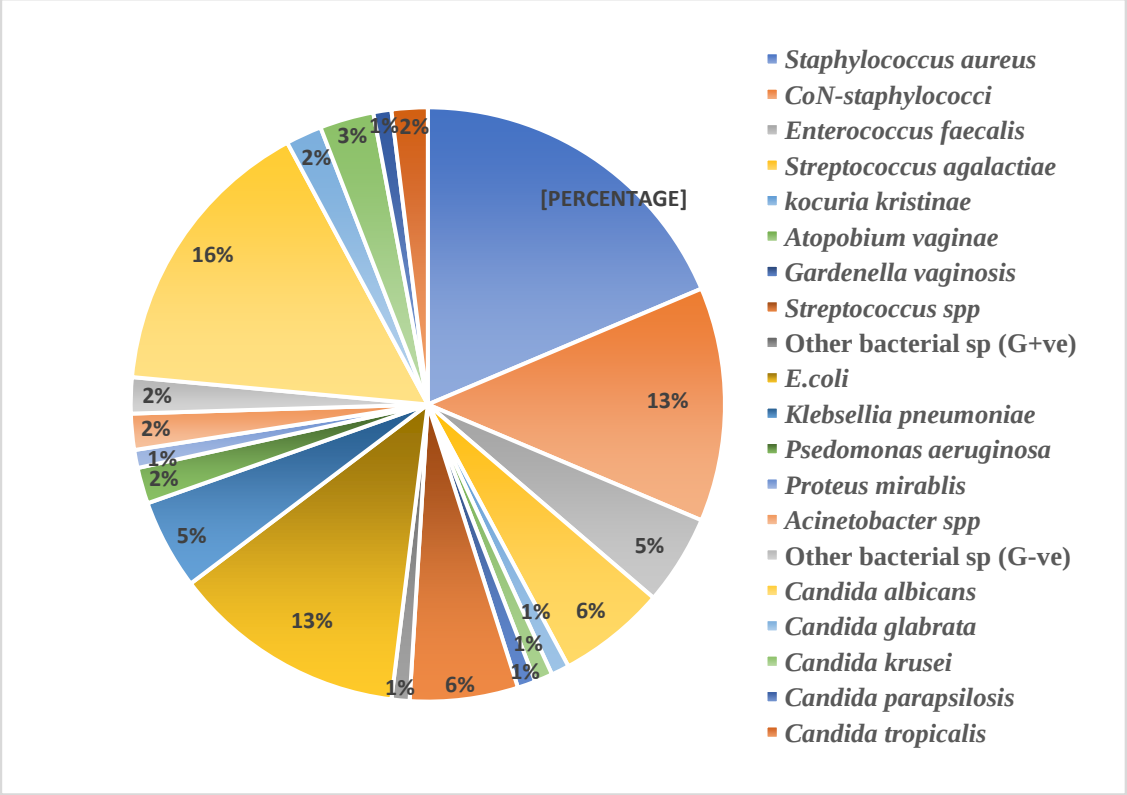

Figure 1: Culture-based prevalence of microbial community in vaginitis-positive patients (n=333 isolated).

The patients with high scores (≥7) on diagnostic Clinical criteria (Amsel criteria) and the laboratory testing method (Nugent criteria) were further subjected for isolation of pathogens. Total 333 pathogens were identified based on morphological and biochemical characteristics, culture, and vitek-2. Among these isolates, 172 (51.65%) were Gram-positive including *S. aureus*, *CoN-staphylococci*, *Streptococcus agalactiae*, *E. faecalis*, *and Streptococcus sp*., while 78 (23.42%) were Gram-negative; *E. coli*, *Klebselliapneumonia* and*Pseudomonas aeruginosa*. Additionally, 4 (1.20%) were Gram-variable (*G. vaginalis*, *Atopobiumvaginae*). while Yeasts was isolated from 79 (23.72%) patients including *Candida albicans*, *Candida krusei*, *Candida glabrata* and *Candida tropicalis*(Figure 1).

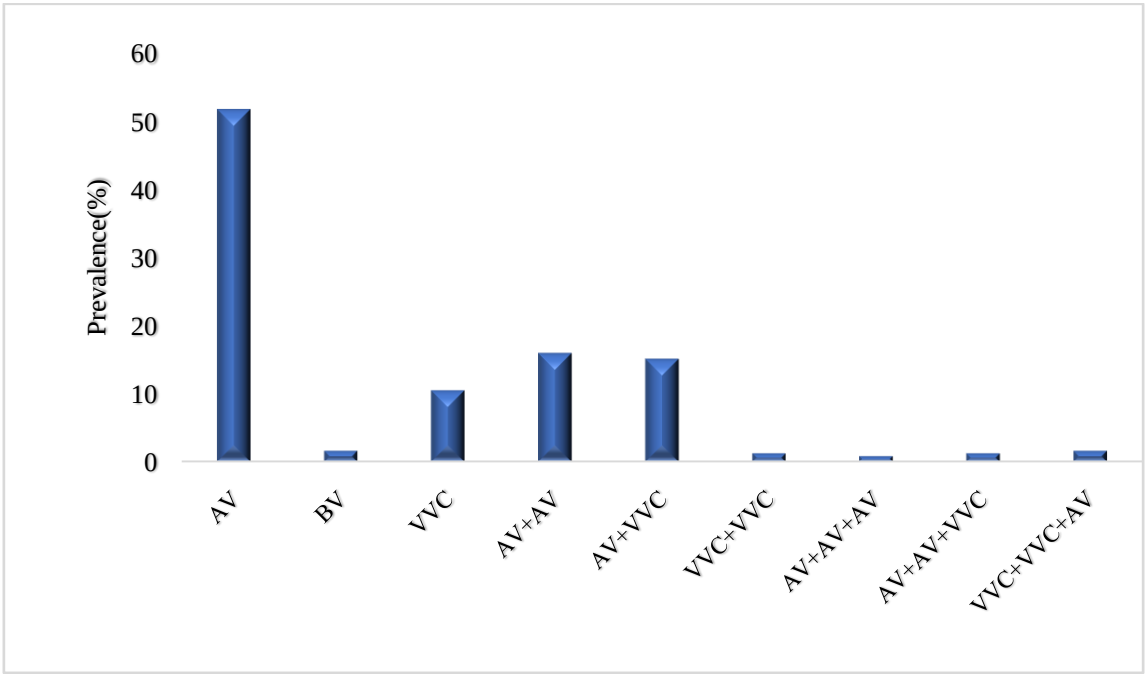

Figure 2: Distribution of different types of vaginitis among patients (n=238).

The prevalence of AV, BV and VVC among women was 84.8% (202/238), 1.68% (4/238), 28.57% (68/238), respectively. Overall, 63.86% (152/238) patients had single infection and 36.13% (86/238) had mixed vaginitis. Out of 86 mixed vaginitis, 77(89.53%) had a double vaginal infection and 9 (10.46%), a triple infection (Figure 2).

Regarding the prevalence of microbial vaginitis,202 (84.8%) had (AV), out of 202 cases, the majority, 123 (60.80%), were diagnosed as single occurrences. The mixed cases accounted for 79 (39.10%), where AV occurred alongside other types. Specifically, 38 cases involved multiple instances of AV, while 36 cases combined AV with vulvovaginal candidiasis (VVC). Notably, there were no cases of AV occurring with bacterial vaginosis (BV). A small number of cases showed combinations of AV with itself, with 2.53% having three instances of AV and 3.79% involving AV and VCC.

In contrast, 4 (1.68%) had (BV), out of 4 cases, all were single occurrences, representing 100% with no mixed cases reported. This indicates that BV is less commonly seen in combination with other types. Of the 68 (28.57%) had (VVC), there were 68 cases recorded. Among these, 25 cases (36.76%) were identified as single occurrences, while 43 cases (63.23%) were classified as mixed. A significant number of these mixed cases, 36 (83.72%), involved a combination of VVC and AV. There were also 3 instances where VVC occurred with itself, and 4 cases involved both VVC and AV in a three-way combination.

Additionally, the table includes data on normal cases, with 36 individuals scoring ≤3, indicating no significant issues. There were also 6 cases identified as having negative cultures, suggesting the absence of infection.

Overall, the data illustrates the prevalence of AV as the most common type of vaginitis, often appearing in conjunction with other conditions, particularly VVC. BV, on the other hand, predominantly occurs alone (Table 3).

Table 3: Frequency of different types of vaginitis occurring individually or in combination with other types of vaginitis.

Diagnosis	Type		Frequency (%)
AV n=202	**Single (G+ve 87) , (G-ve 36)**		**123/202 (60.80)**
	Mixed 79/202 (39.10%)	AV+AV	38(48.10)
		AV+BV	0
		AV+VVC	36 (45.56)
		AV+AV+AV	2(2.53)
		AV+AV+VCC	3(3.79)
BV n=4	**Single**		**4(100.0)**
	Mixed		**0**
VVC n=68	**Single**		**25/68 (36.76)**
	Mixed 43/68(63.23%)	VVC+VVC	3 (6.97)
		VVC+AV	36 (83.72)
		VVC+BV	0
		VVC+VVC+AV	4 (9.30)

Vaginitis was considered a single or mixed infection, based on isolation of dominant etiological agents (*S.aureus , Streptococcus sp,E.coli, E. faecalis, G. vaginalis,K.pneumoniae, and C. albicans,…..*) from vaginal swabs. For instance, AV (single) means isolation of *S. aureus*only from a sample. AV (mixed) indicates isolation of two or more etiological agents (e.g., AV+VVC indicates isolation of both S. aureusand *C. albicans*, AV+AV indicates isolation of bothdifferent type of bacteria). Similarly, mixing with other types of vaginitis was calculated.

Table 4: Comparison between microbial isolates in respect to patient's characteristics

characteristics		Total patient's n=238	Single microbial			Polymicrobial (Mixed)					
			AV n= 123	BV n=4	VVC n=25	double mixed n=77			Triple mixed n=9		
						AV+ AV n= 38	AV+ VVC n=36	VVC +VVC n= 3	AV+ AV+ AV n=2	AV+ AV+ VVC n=3	VVC +VVC+AV n=4
Age	15-25	35	18	0	3	6	6	0	0	1	1
	26-35	118	62	1	12	15	20	3	2	0	3
	36-45	53	25	2	7	9	9	0	0	1	0
	46-55	32	18	1	3	8	1	0	0	1	0
	Chi-square		0.732	2.891	0.606	2.942	4.131	3.077	2.043	3.270	2.267
	p-value		0.866	0.409	0.895	0.401	0.248	0.380	0.564	0.352	0.519
patient's	Employed	115	55	3	12	15	21	3	1	2	3
	Un employed	113	63	1	12	21	13	0	1	1	1
	Student	10	5	0	1	2	2	0	0	0	0
	Chi-square		1.440	1.198	0.005	1.425	2.210	3.236	0.088	0.465	1.198
	p-value		0.487	0.549	0.998	0.491	0.331	0.198	0.957	0.792	0.549
Education	Secondary\University	174	83	3	20	26	30	3	2	3	4
	Elementary\Intermediate	54	34	0	4	10	6	0	0	0	0
	Illiterate	10	6	1	1	2	0	0	0	0	0
	Chi-square		4.116	5.092	0.732	0.517	3.054	1.113	0.739	1.113	1.490
	p-value		0.128	0.078	0.694	0.772	0.217	0.573	0.691	0.573	0.475
Maritalstatus	Married	229	119	3	23	36	36	3	2	3	4
	Single	3	3	0	0	0	0	0	0	0	0
	Widow	4	1	0	2	1	0	0	0	0	0
	Divorced	2	0	1	0	1	0	0	0	0	0
	Chi-square		6.066	28.449	7.245	2.539	1.660	0.119	0.079	0.119	0.159
	p-value		0.108	**0.000**	0.064	0.468	0.646	0.989	0.994	0.989	0.984

Kruskal Wallis Test

No significant association was noted among the (age, patient's occupation, Education) and microbial isolates, while maritalstatus had an association significant only with BV. Table 4 shows the association between the various demographic factors and microbial isolates.

Table 5: Clinical symptoms of related to vaginal discharge and the associated microbial type.

Kruskal Wallis Test

Clinical symptoms		Frequency n=238(%)	Single microbial			Polymicrobial (Mixed)					
			AV n= 123	BV n=4	VVC n=25	double mixed n=77			Triple mixed n=9		
						AV+ AV n= 38	AV +VVC n=36	VVC+ VVC n= 3	AV+ AV+ AV n=2	AV+ AV+ VVC n=3	VVC+VVC+AV n=4
Color	White	156(65.5)	76	1	18	24	28	3	2	1	3
	Yellow	56(23.5)	35	2	3	9	5	0	0	1	1
	Green	13(5.5)	2	1	3	4	3	0	0	0	0
	Clear	6(2.5)	5	0	1	0	0	0	0	0	0

	Brown	7(2.9)	5	0	0	1	0	0	0	1	0
	Chi-square		13.475	5.275	4.985	3.304	5.577	1.590	1.056	10.346	0.502
	p-value		**0.009**	0.260	0.289	0.508	0.233	0.811	0.901	**0.035**	0.973
Consistency	Mucoid	139(58.4)	87	3	7	22	15	1	2	2	0
	Thick white	59(24.8)	12	0	18	7	16	2	0	1	3
	Frothy	24(10.1)	16	1	0	4	2	0	0	0	1
	butter	16(6.7)	8	0	0	5	3	0	0	0	0
	Chi-square		31.875	2.362	34.087	3.521	9.630	2.974	1.430	0.633	7.652
	p-value		**0.000**	0.501	**0.000**	0.318	**0.022**	0.396	0.698	0.889	**0.054**
Odor	Fishy	17(7.1)	8	3	1	2	2	0	0	1	0
	Offensive	142(59.7)	73	1	10	28	26	1	1	2	0
	None offensive	30(12.6)	18	0	6	2	2	1	0	0	1
	Others(dough)	36(15.1)	16	0	4	6	5	1	1	0	3
	No odor	13(5.5)	8	0	4	0	1	0	0	0	0
	Chi-square		2.232	28.277	10.722	6.105	3.531	2.427	2.153	3.935	13.023
	p-value		0.693	**0.000**	**0.030**	0.191	0.473	0.658	0.708	0.415	**0.011**
Duration	Acute	46(19.3)	21	0	6	8	7	0	1	2	1
	Chronic	140(58.8)	73	4	12	24	21	3	0	1	2
	Recurrent	52(21.8)	29	0	7	6	8	0	1	0	1
	Chi-square		1.025	2.836	1.350	0.970	0.005	2.118	2.888	4.503	0.139
	p-value		0.599	0.242	0.509	0.616	0.998	0.347	0.236	0.105	0.933

A significant association was noted among the color discharge and singlemicrobial of*Aerobic Vaginitis* (AV), polymicrobial triple mixed of (AV+AV+VVC). A significant association was noted among the consistency discharge and single microbial of (AV), (VVC), polymicrobial mixed of (VVC+VVC+AV), (AV+VVC). A significant association was noted among the odor discharge and single microbial of (BV), (VVC), polymicrobial mixed of (VVC+VVC+AV).Whileduration had no association significant with microbial types. Table 5 shows the association between the various demographic factors and microbial isolates.

Table 6: Correlation of the Gynecological and Obstetric history with type of isolated organisms.

Obstetric history			Frequency n=238 (%)	Single microbial			Polymicrobial (Mixed)					
				AV n=123	BV n=4	VVC n=25	double mixed n=77			double mixed n=77		
							AV+AV n=38	AV+VVC n=36	VVC+VVC n=3	AV+AV+AV n=2	AV+AV+VVC n=3	VVC+VVC+AV n=4
Status of	Pause\ stopped	Secondary Amenorrhea	17(24.3)	10	1	0	4	1	0	0	1	0
		Menopause	9(12.9)	4	1	2	2	0	0	0	0	0
		Pregnancy	34(48.6)	18	0	1	5	7	2	0	1	0
		Lactation	5(7.1)	4	0	0	0	1	0	0	0	0
		Contraceptive	2(2.9)	2	0	0	0	0	0	0	0	0
		Hysterectomy	3(4.3)	0	0	0	3	0	0	0	0	0

		Total	70 (29.4)	38	2	3	14	9	2	0	2	0
		Chi-square	6.995	4.006	8.297	14.298	4.776	2.149	0.000	1.104	0.000	6.995
		P-value	0.405	0.221	0.549	0.141	**0.041**	0.444	0.828	1.000	0.954	1.000
Continued	Regular 117(69.6 %)	Painful	86(73.5)	41	1	11	13	16	0	2	0	2
		No painful	31(26.5)	15	1	5	2	4	1	0	1	2
	Irregular 51(30.4%)	Painful	32(62.7)	18	0	3	7	4	0	0	0	0
		No painful	19(37.3)	11	0	3	2	3	0	0	0	0
	Total		168 (70.6)	85	2	22	24	271	1	2	1	4
	Chi-square		1.544	1.675	0.689	3.219	0.936	4.387	1.895	4.387	3.390	1.544
	P-value		0.602	0.672	0.643	0.876	0.359	0.817	0.223	0.594	0.223	0.335

Kruskal Wallis Test

No significant association was noted among the Continued of Menstruation cycle and microbial isolates, while pause or stopped of menstruation had an association significant only with polymicrobial mixed of (AV+AV). Table 6 shows the association of the Gynecological and Obstetric history with type of isolated organisms**.**

Table 7: Correlation of the Gynecological and Obstetric history with type of isolated organisms.

Obstetric history			Frequency n=238(%)	Single microbial			Polymicrobial (Mixed)					
				AV n=123	BV n=4	VVC n=25	double mixed n=77			double mixed n=77		
							AV+ AV n= 38	AV+ VVC n=36	VVC +VVC n= 3	AV+ AV+ AV n=2	AV+ AV+ VVC n=3	VVC +VVC+AV n=4
Previous History of excessive vaginal discharge	Positive history (frequency) 192(80.7%)	2-4 times	77(40.1)	47	0	10	7	11	0	1	0	1
		5-8 times	79(41.1)	44	0	4	14	14	2	0	0	1
		≥ 10 times	36(18.8)	11	4	5	9	4	1	0	1	1
	Negative history (for the first time)		46(19.3)	21	0	6	8	7	0	1	2	1
	Chi-square			10.270	22.732	3.731	5.132	0.905	3.248	2.141	6.154	0.478
	P-value			**0.016**	**0.000**	0.292	0.162	0.284	0.355	0.544	0.104	0.924
History of miscarriage	Yes		87(36.6)	54	2	10	10	9	0	1	0	1
	No		151(63.4)	69	2	15	28	27	3	1	3	3
	Chi-square			5.901	0.316	0.142	2.035	2.431	1.743	0.157	1.743	0.233
	P-value			**0.015**	0.574	0.706	0.154	0.119	0.187	0.692	0.187	0.629
Hormones	Use		32(13.4)	13	1	4	9	4	0	1	0	0
	Not used		206(86.6)	110	3	21	29	32	3	1	3	4
	Chi-square			1.802	0.465	0.156	4.056	0.198	0.470	2.306	0.470	0.629
	P-value			0.179	0.495	0.693	**0.044**	0.657	0.493	0.129	0.493	0.428

Kruskal Wallis Test

A significant association was noted among the Previous History of excessive vaginal discharge and single microbial of (AV), (BV). A significant association was noted among the History of miscarriage and single microbial of (AV),polymicrobial triple mixed of (AV+AV+VVC). A significant association was noted among the consistency discharge and single microbial of (AV).While Hormones a significant association withpolymicrobial mixed of (AV+AV).Table 7 shows the association between the various Obstetric histories with type of isolated organisms.

Table 8: Correlation of the type of contraception with type of isolated organisms.

Type of contraception	Frequency n=238(%)	Single microbial			Polymicrobial (Mixed)					
		AV n= 123	BV n=4	VVC n=25	double mixed n=77			double mixed n=77		
					AV+AV n= 38	AV+VVC n=36	VVC+VVC n= 3	AV+AV+AV n=2	AV+AV+VVC n=3	VVC+VVC+AV n=4
Not used	108(45.4)	57	1	8	19	16	2	2	2	1
Contraceptive pills	28(11.8)	14	1	3	4	3	1	0	0	2
IUCD	18(7.6)	7	0	2	4	4	0	0	0	1
Condom	50(21.0)	28	2	5	5	10	0	0	0	0
External	23(9.7)	9	0	6	4	3	0	0	1	0
Tubal ligation	11(4.6)	8	0	1	2	0	0	0	0	0
Chi-square		5.018	3.480	7.058	2.189	4.085	2.795	2.418	3.416	8.464
P-value		0.414	0.626	0.216	0.822	0.537	0.732	0.789	0.636	0.132

Kruskal Wallis Test

No significant association was noted among the type of contraception and microbial isolates. Table 8 shows the association of the type of contraception with type of isolated organisms**.**

Table 9: Correlation of the type of contraception with the physical parameter of the vaginal discharge.

Type of contraception	Color					Consistency				Odor				
	White n=156	Yellow n=56	Green n= 13	Clear n= 6	Brown n= 7	Mucoid n=139	Thick white n=59	Frothy n=24	Butter n=16	Fishy n=17	Offensive n=142	None offensive n=30	Others (dough)	No odor n=13
Not used	66	28	9	1	4	69	24	10	5	8	62	18	16	4
Contraceptive pills	21	7	0	0	0	12	10	4	2	1	16	5	4	2
IUCD	9	5	2	1	1	9	5	2	2	1	11	2	3	1
Condom	38	8	1	2	1	29	12	5	4	5	30	3	8	4
External	13	7	1	1	1	14	6	1	2	1	18	1	3	0
Tubal ligation	9	1	0	1	0	6	2	2	1	1	5	1	2	2
Correlation R=P=	-.070 .283 [c]	.043 .505 [c]	.121 .062 [c]	-.120 .064 [c]	.039 .550 [c]	.058 .372 [c]	-.019 .772 [c]	-.008 .902 [c]	-.072 .267 [c]	-.005 .942 [c]	-.054 .408 [c]	**.139* .032** [c]	-.008 .898 [c]	-.068 .296 [c]

***. Correlation is significant at the 0.05 level.**

c. Based on normal approximation.

No significant association was noted among the type of contraception and the physical parameter of the vaginal discharge, while non-offensive odor had an association significant only with type of the contraception. Table 9 shows the association of the type of contraception with the physical parameter of the vaginal discharge.

Table 10: Female sanitary habits and Correlation with type of isolated organisms.

Female sanitary habits (YES)	Frequency n=238 (%)	Single microbial			Polymicrobial (Mixed)					
		AV	BV	VVC	double mixed			Triple mixed		
					AV+AV	AV+VVC	VVC+VVC	AV+AV+	AV+AV+	VVC+VVC+

								AV	VVC	AV
Frequent douches	60(25.2)	31	1	6	9	10	0	1	1	1
Chi-square		0.000	0.000	0.022	0.056	0.148	1.020	0.655	0.106	0.000
p-value		0.998	0.992	0.883	0.814	0.701	0.313	0.418	0.745	0.992
Deodorant sprays or pads	73(30.7)	39	2	12	6	10	0	2	0	2
Chi-square		0.128	0.712	3.928	4.690	0.166	1.339	4.540	1.339	0.712
p-value		0.721	0.399	**0.047**	**0.030**	0.683	0.247	**0.033**	0.247	0.399
Feminine hygiene sprays	61(25.6)	34	2	4	12	7	0	0	2	0
Chi-square		0.538	1.262	1.353	0.836	0.848	1.043	0.692	1.043	1.262
p-value		0.463	0.261	0.245	0.361	0.357	0.307	0.405	0.307	0.261
New detergent soap or personal soaps	78(32.8)	46	2	10	10	8	1	0	0	1
Chi-square		2.461	0.546	0.659	0.852	2.134	0.000	0.979	1.475	0.111
p-value		0.117	0.460	0.417	0.356	0.144	0.983	0.322	0.225	0.739
Panty hose nylon	15(6.3)	5	0	2	5	3	0	0	0	0
Chi-square		2.149	0.273	0.136	3.584	0.295	0.204	0.135	0.204	0.273
p-value		0.143	0.602	0.713	0.058	0.587	0.652	0.713	0.652	0.602
Vaginal lubricant or oil	39(16.4)	18	1	3	6	9	0	0	1	1
Chi-square		0.568	0.219	0.391	0.012	2.287	0.593	0.394	0.634	0.219
p-value		0.451	0.640	0.532	0.914	0.130	0.441	0.530	0.426	0.640
Sanitary towels for a long time	25(10.5)	12	1	2	6	3	0	0	1	0
Chi-square		0.151	0.906	0.186	1.338	0.212	0.355	0.236	1.677	0.476
p-value		0.698	0.341	0.667	0.247	0.645	0.551	0.627	0.195	0.490
Use of wet under wear	41(17.2)	23	0	6	6	6	0	0	0	0
Chi-square		0.385	0.843	0.895	0.065	0.009	0.630	0.418	0.630	0.843
p-value		0.535	0.358	0.344	0.798	0.923	0.427	0.518	0.427	0.358
Not used	39 (16.4)	20	0	3	8	4	2	0	1	1
Chi-square		0.003	0.794	0.391	0.716	0.858	5.583	0.394	0.634	0.219
p-value		0.957	0.373	0.532	0.398	0.354	**0.018**	0.530	0.426	0.640

Kruskal Wallis Test

A significant association was noted among the Deodorant sprays or pads and single microbial of (VVC), andpolymicrobial mixed of (AV+AV). A significant association was noted among not used Female sanitary habits and polymicrobialmixed of (VVC+VVC).While no significant association was noted among the (Frequent douches, Feminine hygiene sprays, New detergent soap, Panty hose nylon, Vaginal lubricant or oil,

Sanitary towels for a long time, Use of wet under wear) withtype of isolated organisms. Table 10 shows the female sanitary habits and Correlation with type of isolated organisms.

Table 11: Symptoms of related to vaginal discharge and the associated microbial type.

Symptoms (YES)	Single microbial			Polymicrobial (Mixed)					
	AV	BV	VVC	double mixed n=77			Triple mixed n=9		
				AV+ AV	AV+V VC	VVC+ VVC	AV+ AV+ AV	AV+A V+VV C	VVC+V VC+AV
Pain at intercourse	47	0	13	15	17	0	1	1	3
Chi-square	0.680	2.787	1.456	0.031	0.731	2.081	0.071	0.069	1.968
p-value	0.410	0.095	0.227	0.861	0.392	0.149	0.790	0.793	0.161
Lower abdominal pain	77	3	15	24	19	1	0	3	2
Chi-square	0.467	0.356	0.003	0.133	1.055	0.935	3.077	1.975	0.187
p-value	0.495	0.551	0.957	0.716	0.304	0.334	0.079	0.160	0.665
Burning sensation	71	3	16	24	17	3	1	3	4
Chi-square	0.397	0.396	0.217	0.228	2.717	2.045	0.078	2.045	2.739
p-value	0.529	0.529	0.641	0.633	0.099	0.153	0.780	0.153	0.098
Itchiness & scratching	55	3	17	26	24	3	0	2	4
Chi-square	13.833	0.576	1.547	2.688	1.844	2.348	2.588	0.132	3.144
p-value	**0.000**	0.448	0.214	0.101	0.174	0.125	0.108	0.716	0.076
Vaginal soreness	39	3	15	12	10	1	0	1	2
Chi-square	1.119	2.872	7.732	0.215	0.936	0.003	1.076	0.003	0.408
p-value	0.290	0.090	**0.005**	0.643	0.333	0.955	0.300	0.955	0.523
Vaginal dryness	14	1	2	5	6	1	0	1	1
Chi-square	0.604	0.513	0.620	0.001	0.494	1.101	0.301	1.101	0.513
p-value	0.437	0.474	0.431	0.979	0.482	0.294	0.583	0.294	0.474
Dysuria	12	2	2	3	3	0	0	0	0
Chi-square	0.079	8.022	0.051	0.098	0.042	0.308	0.205	0.308	0.413
p-value	0.778	**0.005**	0.821	0.755	0.838	0.579	0.651	0.579	0.521
Inter menstrual bleeding	1	0	0	1	1	0	0	0	0
Chi-square	0.408	0.052	0.355	0.680	0.781	0.039	0.026	0.039	0.052
p-value	0.523	0.820	0.551	0.410	0.377	0.844	0.873	0.844	0.820
Other	6	0	0	0	0	0	0	0	0
Chi-square	5.731	0.105	0.719	1.165	1.092	0.078	0.052	0.078	0.105
p-value	**0.017**	0.746	0.396	0.281	0.296	0.780	0.820	0.780	0.746

Kruskal Wallis Test

A significant association was noted among Itchiness & scratching symptom and single microbial of (AV),a significant association was noted among vaginal soreness symptom and single microbial of (VVC),a significant association wasDysuria with(BV). A significant association was noted among other symptom and single microbial of (AV). While no significant association was noted among the (Pain at intercourse, Lower abdominal pain, Burning sensation, Vaginal dryness, Inter menstrual bleeding) withtype of isolated organisms. Table 11 shows the symptoms of related to vaginal discharge and the associated microbial type.

Table 12: Correlation of the Gynecological and Obstetric history with the physical parameter of the vaginal discharge.

Obstetric history			Color					Consistency				Odor				
			White n=156	Yellow n=56	Green n=13	Clear n=6	Brown n=7	Mucoid n=139	Thick white n=59	Frothy n=24	Butter n=16	Fishy n=17	Offensive n=142	None offensive n=30	Others (dough) n=36	No odor n=13
Status of Menstruation cycle	Pause\ stopped	Secondary Amenorrhea	13	3	1	0	0	9	1	5	2	2	12	0	3	0
		Menopause	5	4	0	0	0	5	1	2	1	2	5	0	2	0
		Pregnancy	19	9	5	0	1	20	10	4	0	3	18	8	4	1
		Lactation	3	2	0	0	0	4	1	0	0	0	2	0	2	1
		Contraceptive	2	0	0	0	0	1	1	0	0	0	2	0	0	0
		Hysterectomy	1	1	1	0	0	1	2	0	0	0	2	1	0	0
		Total	**43**	**19**	**7**	**0**	**1**	**40**	**16**	**11**	**3**	**7**	**41**	**9**	**11**	**2**
		Correlation R= P=	-.058 .375[c]	.066 .308[c]	.096 .141[c]	-.102 .117[c]	-.025 .707[c]	-.021 .752[c]	-.058 .376[c]	**.151* .020**[c]	-.042 .524[c]	.087 .181[c]	-.005 .936[c]	-.018 .788[c]	.015 .823[c]	-.085 .193[c]
	Continued Regular	Painful	58	22	3	2	1	53	23	6	4	6	53	8	14	5
		No painful	24	7	0	0	0	12	12	4	3	2	17	5	4	3
	Irregular	Painful	20	5	1	3	3	24	5	1	2	2	17	4	7	2
		No painful	11	3	2	1	2	10	3	2	4	0	14	4	0	1
	Total		**113**	**37**	**6**	**6**	**6**	**99**	**43**	**13**	**13**	**10**	**101**	**21**	**25**	**11**
	Correlation R= P		.087 .180[c]	-.008 .904[c]	**-.155* .016**[c]	-.005 .930[c]	-.063 .333[c]	.025 .703[c]	.054 .410[c]	-.101 .119[c]	-.019 .765[c]	-.029 .654[c]	.008 .906[c]	-.051 .438[c]	.022 .737[c]	.056 .391[c]

***. Correlation is significant at the 0.05 level.**

c. Based on normal approximation.

A significant association was noted among the Continued of Menstruation cycle and green color discharge, while pause or stopped of menstruation had an association significant only with frothy consistency discharge. Table 12 shows the Correlation of the Gynecological and Obstetric history with the physical parameter0f the vaginal discharge.

Table 13: Correlation of the Gynecological and Obstetric history with the physical parameter0f the vaginal discharge.

Obstetric history			Color					Consistency				Odor				
			White n=156	Yellow n=56	Green n=13	Clear n=6	Brown n=7	Mucoid n=139	Thick white n=59	Frothy n=24	Butter n=16	Fishy n=17	Offensive n=142	None offensive n=30	Others (dough) n=36	No odor n=13
Previous History of excessive vaginal discharge	Positive history (frequency)	2-4 times	51	16	5	4	1	52	15	8	2	3	48	13	7	6
		5-8 times	48	25	3	1	2	44	18	6	11	3	52	7	15	2
		More than 10 times	26	8	2	0	0	15	14	5	2	6	18	3	8	1
	Negative history (for the first time)		31	7	3	1	4	28	12	5	1	5	24	7	6	4
	Correlation R= P=		-.054 .363	.065 .320[c]	-.049 .453	.056 .391[c]	-.091 .161	.084 .197[c]	-.092 .157[c]	-.024 .717	.022 .737[c]	**-.139***	.047 .135[c]	.028 .667[c]	-.057 .385[c]	-.004 .956

			[c]		[c]		[c]			[c]		**.032** [c]				[c]
History of Miscarrage	Miscarriages	Yes	55	21	5	2	4	50	18	14	5	5	51	10	15	6
		No	101	35	8	4	3	89	41	10	11	12	91	20	21	7
	Correlation R= P=		-.083 .203 [c]	.024 .217 [c]	.070 .284 [c]	.101 .122 [c]	.100 .122 [c]	-.014 .826 [c]	-.072 .268 [c]	**.151* .019** [c]	-.030 .650 [c]	-.041 .528 [c]	-.016 .804 [c]	-.025 .697 [c]	.045 .491 [c]	.048 .462 [c]
Hormones	Use		22	2	4	2	2	5	2	22	3	2	23	0	4	3
	Not used		134	54	9	4	5	117	56	19	14	15	119	30	32	10
Correlation R= P=			.040 .538 [c]	**-.163* .012** [c]	**.163* .012** [c]	.015 .816 [c]	.063 .332 [c]	.083 .203 [c]	**-.141* .030** [c]	.073 .265 [c]	-.007 .909 [c]	-.014 .834 [c]	.098 .131 [c]	**-.150* .021** [c]	-.029 .657 [c]	.068 .297 [c]

***. Correlation is significant at the 0.05 level.**

c. Based on normal approximation.

A significant association was noted among the Previous History of excessive vaginal discharge and fishy odor discharge. A significant association was noted among the History of miscarriage and frothy consistency discharge. A significant association was noted among the Hormones and yellow,green color discharge. A significant association was noted among the Hormones and thick white consistency,a significant association was noted among the Hormones and non-offensive odor discharge. Table 13 shows Correlation of the Gynecological and Obstetric history with the physical parameter of the vaginal discharge.

DISCUSSION

This study showed a prevalence rate of 87.14% of vaginal discharge among primary health care patients in Al-Kafeel Specialized Hospital and Obstetrics and Gynecology Teaching Hospital in Kerbala, Kerbala, Iraq.

National and international comparisons are hampered because of the different methodology of studies. Most of the vaginal infections are the consequence of the invasion of pathogenic bacteria (AV), fungi (VVC) and (BV). The incidence rate of AV is not known in Iraq. In current study, AV was recorded as the most frequent infection, accounting for 84.8% among symptomatic women of total vaginitis cases. The overall incidence of VVC, and BV was 28.5%, and 1.68%, respectively. Previously,Sami [16] reported the incidence rate of BV, TV and VVC as 30.7%, 7.2% and 10%, respectively in Quetta, Pakistan. The vaginal hygiene practices, geographical distribution, and systematic differences in different studies could account for the variability in magnitude of prevalence [17].

In this study,the majority of the patients with vaginal discharge were 26-35 years, Similar mean age was stated in several other studies.[18][19][17] Hereby, it is well-recognized that vaginal infections are always detected in middle aged women in reproductive age.This may indicate that vaginal discharges are more likely to occur in ages associated with frequent hormonal changes (represented by menstrual cycle), higher sexual activity and/or pregnancy.

No significant association was observed between age, patient occupation, or education level and the microbial isolates. However, marital status showed a significant association only with bacterial vaginosis (BV). A study by Machado et al. (2015)[20] on the prevalence of vaginal infections and their associated factors also reported no significant correlation between age, education level, or occupation and the type of microbial infection. However, marital status was found to influence the prevalence of BV significantly, suggesting that sexual activity and related behavioral factors could play a role. This highlights the potential influence of lifestyle and interpersonal factors, particularly marital status, on the incidence of certain vaginal infections like BV.

A significant association was noted among the color discharge and single microbial of Aerobic Vaginitis(AV), polymicrobial triple mixed of (AV+AV+VVC). A significant association was noted among the consistency discharge and single microbial of (AV), (VVC), polymicrobial mixed of (VVC+VVC+AV), (AV+VVC). A significant association was noted among the odor discharge and single microbial of (BV), (VVC), polymicrobial mixed of (VVC+VVC+AV). While duration had no association significant with microbial types. A study by Donders et al. (2002)[21] on aerobic vaginitis and related vaginal infections highlighted the clinical significance of discharge characteristics. They reported that color, consistency, and odor of vaginal discharge correlated significantly with specific microbial patterns, particularly in mixed infections, while duration of symptoms was not a reliable predictor of microbial type. These findings align with the current study and underscore the importance of assessing discharge characteristics in diagnosing and managing vaginal infections.

No significant association was noted among the Continued of Menstruation cycle and microbial isolates, while pause or stopped of menstruation had an association significant only with polymicrobial mixed of (AV+AV). A study by Donders et al. (2010) [22] explored the relationship between menstrual status and vaginal infections.

The findings indicated that post-menopausal women or those experiencing irregular cycles were more prone to polymicrobial infections, particularly combinations involving aerobic vaginitis (AV). Hormonal changes and reduced estrogen levels were suggested as contributing factors. These findings suggest that hormonal and physiological changes associated with menstruation cessation may influence the susceptibility to specific polymicrobial infections.

A significant association was noted among the Previous History of excessive vaginal discharge and single microbial of (AV), (BV). Donders et al. (2002)[21] highlighted that a history of excessive vaginal discharge could predispose women to recurrent AV and BV infections. The study suggested that persistent alterations in the vaginal environment due to previous infections create favorable conditions for pathogenic microbes to colonize.

A significant association was noted among the History of miscarriage and single microbial of (AV), polymicrobial triple mixed of (AV+AV+VVC). Research by Kostova et al. (2023)[23] identified a strong link between miscarriage history and polymicrobial infections, including mixed infections like (AV+AV+VVC). This association was attributed to immune and hormonal changes following miscarriage, which may disrupt the vaginal microbiota.

A significant association was noted among the consistency discharge and single microbial of (AV). A study by Donders et al. (2011)[24] specifically focused on discharge characteristics and their diagnostic value in distinguishing AV and BV from other infections. They found that AV-related infections often presented with abnormal consistency and inflammatory features, differentiating them from other causes of vaginitis.

While Hormones a significant association with polymicrobial mixed of (AV+AV).Mastromarino et al. (2014) [25] demonstrated that hormonal fluctuations, especially reduced estrogen levels, were strongly associated with an increased risk of mixed infections such as (AV+AV). Hormones play a crucial role in maintaining vaginal pH and microbiota balance, and disruptions can lead to pathogenic colonization.

No significant association was noted among the type of contraception and microbial isolates. A study by van de Wijgert et al. (2017)[26] explored the impact of contraceptive methods on the vaginal microbiota and infection risk. The study concluded that while hormonal contraceptives, such as oral pills and implants, influenced the vaginal microbiota composition, there was no consistent association between specific contraceptive types and microbial infections like AV, BV, or VVC. However, the use of intrauterine devices (IUDs) showed a slight increase in BV prevalence, though this was not statistically significant in some cohorts. This finding aligns with the current study, suggesting that the type of contraception may not have a significant direct impact on microbial isolates but may influence the broader vaginal ecosystem in specific cases.

No significant association was noted among the type of contraception and the physical parameter of the vaginal discharge, while non-offensive odor had an association significant only with type of the contraception. A study by Zong et al. (2017)[27] investigated the effects of different contraceptive methods on the physical characteristics of vaginal discharge, including odor, consistency, and color. While no significant association was found between contraceptive type and discharge physical parameters like consistency or color, the study found that hormonal contraceptives, particularly the oral contraceptive pill, were associated with a reduction in the offensive odor of vaginal discharge. This change was thought to be due to alterations in the vaginal pH and microbiota composition caused by hormonal shifts. This finding supports the current study, which suggests that while contraception may not influence the physical characteristics of discharge significantly, it can affect the odor of vaginal discharge.

A significant association was noted among the Deodorant sprays or pads and single microbial of (VVC), and polymicrobial mixed of (AV+AV). A significant association was noted among not used Female sanitary habits and polymicrobial mixed of (VVC+VVC). While no significant association was noted among the (Frequent douches, Feminine hygiene sprays, New detergent soap, Panty hose nylon, Vaginal lubricant or oil, Sanitary towels for a long time, Use of wet under wear) withtype of isolated organisms. A study by van der Meijden et al. (2009)[28] investigated the impact of various feminine hygiene practices on vaginal infections. The study found that deodorant sprays and pads were associated with an increased risk of VVC, as they may disrupt the natural balance of the vaginal microbiota, promoting the overgrowth of Candida species. On the other hand, practices like frequent douching, the use of feminine hygiene sprays, and wearing tight-fitting synthetic clothing were not consistently linked with microbial infections but were associated with other factors like vaginal irritation and discomfort. This study supports the current findings, where deodorant sprays and certain sanitary habits had a significant association with specific infections, while other hygiene practices showed no significant correlation with microbial isolates.

A significant association was noted among Itchiness & scratching symptom and single microbial of (AV), a significant association was noted among vaginal soreness symptom and single microbial of (VVC), a significant association was Dysuria with (BV). A significant association was noted among other symptom and single microbial of (AV). While no significant association was noted among the (Pain at intercourse, Lower abdominal pain, Burning sensation, Vaginal dryness, Inter menstrual bleeding) withtype of isolated organisms. A study by Farage et al. (2013)[29] examined the association between clinical symptoms and microbial infections in women

with vaginitis. The study found that itchiness and scratching were frequently linked with AV, while vaginal soreness was predominantly associated with VVC. Dysuria was significantly correlated with BV, supporting the findings of the current study. The study also noted that symptoms like pain during intercourse, lower abdominal pain, and vaginal dryness did not consistently correlate with any specific microbial pathogens, suggesting that these symptoms could be indicative of multiple underlying conditions, rather than being linked to a single infection type. This study provides further evidence that specific symptoms are often associated with particular microbial infections, while other symptoms may be more generalized.

A significant association was noted among the Continued of Menstruation cycle and green color discharge, while pause or stopped of menstruation had an association significant only with frothy consistency discharge. A study by Falk et al. (2015)[30] explored the relationship between menstrual status and vaginal discharge characteristics. The study found that women with an ongoing menstruation cycle were more likely to experience green-colored discharge, which was often associated with bacterial infections like BV. In contrast, women who had a pause or cessation of menstruation, such as postmenopausal women or those with amenorrhea, were more likely to present with frothy discharge, typically linked to infections like trichomoniasis. This study aligns with the current findings, indicating that menstrual status can influence both the color and consistency of vaginal discharge, potentially pointing to specific types of infections.

A significant association was noted among the Previous History of excessive vaginal discharge and fishy odor discharge. A study by Sobel et al. (2006)[31] found that women with a history of excessive vaginal discharge, particularly those with recurrent BV, often presented with a characteristic fishy odor, a key diagnostic feature of BV.

A significant association was noted among the History of miscarriage and frothy consistency discharge. Research by van der Meijden et al. (2009)[28] suggested that women with a history of miscarriage were more likely to have frothy discharge, particularly in infections like trichomoniasis, which are linked to hormonal changes during and after pregnancy.

A significant association was noted among the Hormones and yellow, green color discharge. A study by Mastromarino et al. (2014)[25] observed that hormonal fluctuations, particularly during the menstrual cycle or menopause, can lead to changes in the vaginal discharge, including yellow and green colors, which were often associated with bacterial infections like BV.

A significant association was noted among the Hormones and thick white consistency, a significant association was noted among the Hormones and non-offensive odor discharge. A study by Falagas et al. (2007)[32] linked thick white consistency discharge to hormonal changes, particularly in conditions like VVC (vulvovaginal candidiasis), which is influenced by elevated estrogen levels. A study by Donders et al. (2011)[24] indicated that women experiencing hormonal changes, such as during pregnancy or using oral contraceptives, often had non-offensive odor discharge, which could be related to changes in the vaginal microbiota.

These studies support the current findings, showing that a history of excessive discharge, miscarriage, and hormonal fluctuations significantly influence the characteristics and odor of vaginal discharge.

CONCLUSION

Aerobic vaginitis (AV) and vulvovaginal candidiasis (VVC) are the common causes of vaginitis in Iraqi women.

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