

The prevalence of Candidiasis, Trichomoniasis and Gonorrhea from patient by using rapid immunochromatographic test in kerbala and Babylon cities.

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ABSTRACT

Sexually transmitted diseases (STDs) are infections that are transmitted between individuals via sexual contact. They are typically transmitted through vaginal and anal intercourse. There are more than 20 types of STDs, including bacteria, viruses, fungi and parasites. The purpose of this study was to use an immunochromatography to estimate how many cases of *Candida albicans*, *Trichomonas vaginalis*, and *Neisseria gonorrhea* there were among females and males in the province of Kerbala and Babylon/ Iraq. A cross-sectional study was conducted on 300 patients (150 male and 150 female) with abnormal vaginal discharge, itching, dysuria, dyspareunia, urethritis, and prostatitis who visited private clinics in Kerbala and Babylon cities from November to June 2023. The initial swab was used with immunochromatography kits identified Candida, Trichomonas and Neisseria, the results found out of 300 samples, 150 for each gender, 81 positive cases for *Candida albicans*, 43 positive cases for *Trichomonas vaginalis*, 20 positive cases for *Neisseria gonorrhea* and 156 negative samples may have additional causes and the clinical samples showed 19.67%, 11.33%, and 2% *Candida albicans*, *Trichomonas vaginalis*, and *Neisseria gonorrhea* respectively infections in females while in males had 7.33% *Candida albicans*, 4.67% *Neisseria gonorrhea* and 3% *Trichomonas vaginalis*.

In conclusion: The study demonstrates that *Trichomonas vaginalis* has the highest infection rate in females as well as *Neisseria gonorrhea* in males.

Keywords: *Trichomonas vaginalis*, *Neisseria gonorrhea*, *Candida albicans*, immunochromatographic test

INTRODUCTION:

Sexually transmissible diseases (STDs) are the most prevalent acute illnesses worldwide include STDs. A group of illnesses made up of more than 30 bacterial, viral, and parasitic pathogens are spread through sexual contact. Even though some infections can spread by

means other than sexual contact, epidemiologically speaking, sexual contact is the most essential way for them to do so. By facilitating the prevention of the spread of sexually transmitted infectious diseases and associated sequelae, laboratory and point-of-care testing have the potential to be significant contributors to the management and control of STDs (Barrow *et al.*, 2020).

The right selection of diagnostic tests is challenging due to the high prevalence of STDs and the range of possible tests for each disease. Many of the STD tests that are now on the market have characteristics and potential drawbacks that may affect how effectively they can be utilized to improve STD control. Furthermore, it can be challenging to apply the various tests that are accessible in an era of constrained resources for a specific purpose. The choice of tests should be based on a prioritization approach that takes into account the likelihood of an illness, its impact on people and populations, its complications, test performance features, test costs, and the purposes for which the tests are being conducted (Hocking *et al.*, 2023).

The crucial factors set STD infection epidemiology apart from other infections that result in vaginal discharge. Included the distribution of infection is different from that of *Trichomonas vaginalis* infection, gonorrhea and candida infections appear to peak significantly later in life between 40 and 50 years of age (Engel *et al.*, 2022).

Trichomonas vaginalis relies on sexual transmission to spread from one host to another, the gender distribution of infections with laboratory-confirmed diagnoses of *Trichomonas vaginalis* is significantly skewed, with a female-to-male ratio as high as 4:1. This distribution is shown in the few studies that included males and females as well as the infection rates experienced by male partners of sick females, which range from 22% to 72% (Unemo *et al.*, 2017). Because it is picky, *Neisseria gonorrhea* needs a sophisticated, nutritionally loaded culture media to develop in vitro. Only humans are infected with *Neisseria gonorrhea*, which colonizes mucosal surfaces and is the cause of urethritis in males and cervicitis in females in lower urogenital tract infections. Asymptomatic urogenital infection affects fewer males than it does females, who are more likely to develop it (Ohnishi *et al.*, 2011).

The most frequent infectious cause of genitourinary candidiasis is *Candida albicans*. This commensal dimorphic yeast colonizes the gastrointestinal tract, skin, and reproductive systems. When observed longitudinally over a year, *Candida albicans* can be isolated from the vaginal tracts of up to 70% of healthy, asymptomatic, non-pregnant female at any given time (Beigi *et al.*, 2004).

The aim of study was determine the prevalence of infection regarding *Candida albicans*, *Trichomonas vaginalis* and *Neisseria gonorrhea* in females and males in Kerbala and Babylon provinces.

MATERIALS AND METHODS

From November, to June 2023, a cross-sectional study was done on 300 patients (150 male and 150 female) with clinical signs like abnormal vaginal discharge, itching, dysuria, dyspareunia, urethritis, prostatitis and epididymitis who went to private clinics in Kerbala and Babylon provinces. The patient's ages ranged from 20 to over 59, and their full information was put into a special questionnaire for each patient. After a clinical check, each clinical swab was taken from each patient depending on clinical findings for example high vaginal swabs (medical procedure performed in obstetrics and gynaecology to test vaginal discharge for the presence of vaginal thrush, bacterial vaginosis and trichomonas vaginalis), cervical swabs, were taken from each female with a bivalve vaginal speculum and urethral swabs for men. No antiseptic lotions were used for swabs taken. Each swab was soaked right away in

phosphate buffer saline. Then, the swabs were carried in an ice pack box, which was recommended for collecting samples and keeping them safe until they could be processed.

The second swab was used to identify *Candida*, *Trichomonas* and *Neisseria* using immunochromatography kits. Each kit was checked every five minutes for a detection of type of three microorganisms. The measurement of the positivity or negativity of *Candida albicans*, *Trichomonas vaginalis* and *Neisseria gonorrhea* was performed by the immunochromatography method, using standard diagnostic bioline reagents trachomatis for rapid, qualitative antigen detection directly from endocervical samples, collected with endocervical swabs for females and urethral swabs for men. A fresh analysis of the samples was also carried out, with a microscope, in order to detect the presence of fungal spores and *Trichomonas vaginalis* and determine the prevalence of these microorganisms in these samples.

INCLUSION CRITERIA

Patient aged 20-59 Years, Patients who have not undergone treatment with vaginal discharge or urethritis in the week prior to sampling. Patients have not had sex in the 48 hours prior to the gynecological clinic. Patients have not douched in the days leading up to the study. Patient without menstrual or abnormal uterine bleeding. Patients with no history of antibiotic therapy use in the 14 days prior to the study.

RECRUITMENT OF STUDY

After corroborating compliance with the inclusion criteria, each patient was explained about the study and their approval to participate in it was requested. The patients participating in the study were given a questionnaire in order to collect information on sociodemographic, clinical and sexual behavior aspects. The sample was taken by each patient, during the time set for the realization of the work, under the supervision of health professionals of the institution.

ETHICS APPROVED

The study conformed to the ethical principles of clinical research: respect, benefit and justice for which the informed consent of the patient were requested to participate in the research project, it was explained what the project would consist of, its importance, how the sample would be taken and that it would not cause any harm. The study was free and the results were handled confidentially. At all times, the anonymity of the patients was managed, responding to their reliability to the services where they went for their study.

Statistical analysis: Chi-square and t-student tests were used to find out if there were any differences between the variables in the study. A P value > 0.05 is thought to be significant.

RESULTS

Out of a total of 300 samples distributed evenly (150) for each gender, the study obtained 81(27%) positive samples for *Candida albicans*, 43 (14.33%) positive samples for *Trichomonas vaginalis*, and 20 (6.67%) samples for *Neisseria gonorrhea*, while the remaining 156 (52%) negative samples, may be refer to other causative agents as present in table 1 and figure 1.

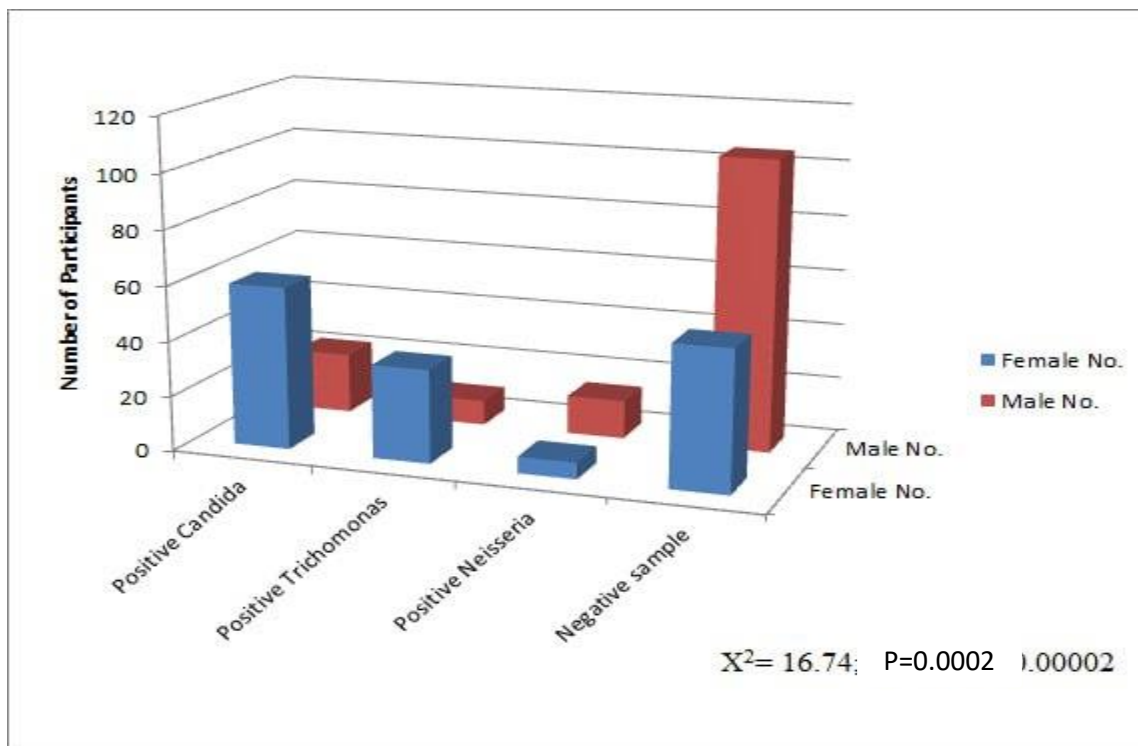
The infection was distributed in the clinical samples according to gender, as it recorded 19.67%, 11.33% and 2% in females for *Candida albicans*, *Trichomonas vaginalis* and *Neisseria gonorrhea*, respectively. Moreover, the samples also recorded 7.33%, 3% and 4.67% in males for *Candida albicans*, *Trichomonas vaginalis* and *Neisseria gonorrhea*, respectively. The present study noticed through table (1) figure (1) there is a clear significant difference ($X^2 = 16.74$, $P = 0.0002$) in some sexual transmitted disease for both sexes, where the *Trichomonas vaginalis* recorded highest infection in female compared to males, while the *Neisseria gonorrhea* recorded the highest infection in males compared to female.

Table (1):-The Percentage of sexual transmitted microorganisms among gender.

X²=
square
DF=
of

Types of microorganisms	Female No.	%	Male No.	%	Total No.	%
<i>Candida albicans</i>	59	19.67	22	7.33	81	27
<i>Trichomonas vaginalis</i>	34	11.33	9	3	43	14.33
<i>Neisseria gonorrhea</i>	6	2	14	4.67	20	6.67
No growth	51	17	105	35	156	52
Total	150		150		300	
Statistical analysis	X ² = 16.74; DF= 2; P= 0.0002					

chi-
test;
Degree



Figures (1) explain the number of sexually transmitted microorganisms in males and females.

Table (2):- The sexually transmitted microorganisms are according to types of isolation as a single.

Types of Microorganism	Vaginal swab	Cervical swab	Urethral swab	Total
	(Female) (%)	(Female) (%)	(Male) (%)	
Single <i>Candida</i>	46 (67.65)	3 (4.41)	19 (27.94)	68
Single <i>Trichomonas</i>	14 (43.75)	12 (37.5)	6 (18.75)	32
Single <i>Neisseria</i>	3 (20)	0 (0)	12 (80)	15
Negative samples	43(27.56)	8 (5.13)	105 (67.31)	156
Total	106	23	142	271
Statistical analysis	$X^2 = 80.94$; $DF = 6$; $P = 0.001$			

$X^2 =$ chi-square test;
 $DF =$ Degree of freedom

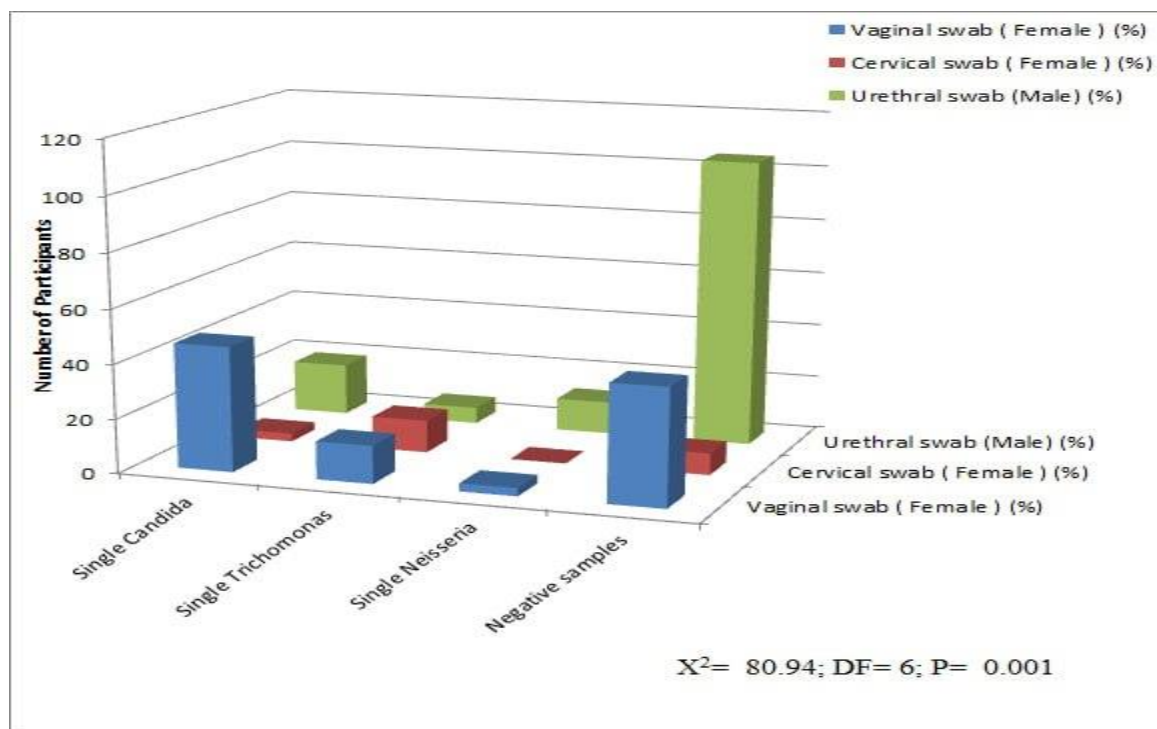


Figure (2) explain the sexually transmitted microorganisms according to types of swabs and isolation as single.

Table (2) figure (2) shows the site of isolation plays a major role with the presence of microorganisms, as the vagina in Female recorded more infection rather than other sites for both Trichomonas and candidiasis organisms, where that the samples of the fungus type Candidiasis were more present and isolated from the vaginal genital tract, its recorded 46 (67.65%) positive samples as single, followed by the Trichomonas parasite, it was recorded 14 (43.75%) from vaginal samples.

The results of the current study showed the relationship among the type of sample isolated from patients of both sexes with the mixture of microorganisms. Candida and Trichomonas were considered the most abundant microorganisms, recording 64.28% compared to the total mixture of other microorganisms. Although the conditions needed for the establishment of *Trichomonas vaginalis* in the genital canal are different from those required by Candida spp., it has been discovered that some female have both of these microbes present at the same time table (3) figure(3).

Table (3):- The sexually transmitted microorganisms accord to the types of isolation as mixed.

Types of Microorganism	Vaginal swabs (Female) (%)	Cervical swabs (Female) (%)	Urethral swab (Male) (%)	Total
Candida +Trichomonas	6 (66.67)	1 (11.11)	2 (22.22)	9
Candida + Neisseria	2 (66.67)	0 (0)	1 (33.33)	3
Trichomonas + Neisseria	0 (0)	0 (0)	1 (100)	1

Candida + Trichomonas + Neisseria	1 (100)	0 (0)	0 (0)	1
Total	9	1	4	14
Statistical analysis	$X^2= 3.63$; DF=6; P=0. 73			

$X^2=$ chisquare test;
DF= Degree of
freedom

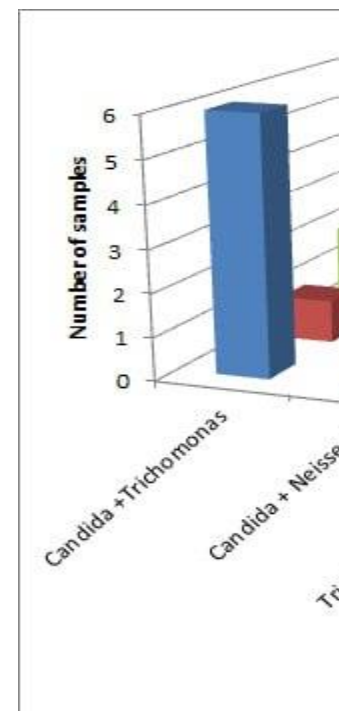


Figure (3) explain the distribution of sexually transmitted microorganisms according to isolation as mixed.

DISCUSSION

Sexually transmitted diseases (STDs) are one of the most common and universal public health problems. Because STDs are responsible for high morbidity as well as serious sequelae, it is very important that all health professionals take them into account when assessing the patient (Mann *et al.*, 2010).

The study found that out of 300 samples, 81 (27%) were positive for *Candida albicans*, 43 (14.33%) were positive for *Trichomonas vaginalis*, and 20 (6.67%) were positive for *Neisseria gonorrhea*; the remaining 156 (52%) were negative; for possible alternative causes, this results are consistent with what was explained by similar studies, where it was found that the infections of candidiasis in female are more than in male, as they recorded 66.63% in female and 33.37% in male (Loster *et al.*, 2016).

Table (2) figure(2) shows that the site of isolation plays a major role in the presence of microorganisms, as the vagina in females recorded more infection than other sites for both Trichomoniasis and candidiasis organisms. The fungus type candidiasis was more present and isolated from the vaginal genital tract, with 46 (63.24%) positive samples as pure, followed by the parasite

Trichomonas, with 18 (60%) from other sites. Hormones, medicines, and immune system changes increase infection risk, Vaginal yeast infections, or vaginitis (Gonçalves *et al.*, 2016).

Whereas, *Neisseria gonorrhea* were recorded to be more present in the urethra of male compared to female) $X^2 = 11.899$, ($P = 0.0181$); Purulent urethral discharge and dysuria are characteristic symptoms of gonococcal urethritis in males (Buder & Lautenschlager, 2022).

Cervical swabs in female recorded less infection with each of *Candida*, *Trichomonas* and *Neisseria*, compared to vaginal and urethral swabs, and this is due to the purity of the uterine lining in female. Both the vagina and uterine mucosa have host unique microbial communities, the uterine mucosa is particularly interesting because it undergoes cyclical changes throughout the menstrual cycle and serves as an important tissue barrier with the primary function of providing protection against pathogens and other toxic factors. Since the uterine mucosal immune system must change in response to hormonal stimuli during menstruation, it is distinct from the immune systems of other mucosal surfaces. In addition to its involvement in pathogen binding, the uterine immune system plays a crucial role in implantation and pregnancy by tolerating the semi-allogeneic fetus (Agostinis *et al.*, 2019).

The current study showed that the percentage of infection with *Candida* fungus was in males 19 (27.94) and this indicates an abnormal presence of *Candida* fungus in the urethra of males. In male who present with signs of urethritis, the presence of *Candida* should be suspected. Symptoms may not present themselves at all, or they may include urine frequency, urgency, dysuria, and lower abdomen pain (El-Reshaid & Sallam, 2021).

The current study indicated the association between the type of sample isolated from patients of both sexes and the mixture of microorganisms. *Candida* and *Trichomonas* comprised 30% of the microbes. *Trichomonas vaginalis* and *Candida* spp. require different circumstances to develop in the genital canal, yet some females have both bacteria, Oral intercourse has been identified by some authors as a risk factor for acquiring vulvovaginitis by *Candida*, and considering that *Candida albicans* is a member of the intestinal microbiota; it is adequate to assume that female colonized by *Candida albicans* in the anal region have a greater possibility of having vulvovaginitis candida. These results were consistent with what the researcher explained when he found a double infection in only 3 female out of a total of 193 female suffering from genital infections (Glehn *et al.*, 2016).

CONCLUSION

- 1- The highest percentage of sexually transmitted microorganisms caused by *Candida albicans*, which recorded 81 positive cases in both sex.
- 2- *Neisseria gonorrhea* more spread in males than females, which register 14 positive out of 20 cases, in opposite *Candida albicans* and *Trichomonas vaginalis* more prevalence in females than males.
- 3- The most common microorganisms were isolated from vaginal swab than cervical and urethral swabs.

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