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Contemporary and Antiquity Approach for Understanding Leucorrhea (*Sayalan Al-Rahim*); A Review

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ABSTRACT

Back ground: Leucorrhoea is a common issue among women of childbearing age (15-45 years), characterized by abnormal vaginal discharge that may be white, yellow, red, or black. It can originate from the vagina or cervix and is a chronic condition affecting parts of the genital tract. Determining the underlying cause is crucial for effective management. In Unani System of Medicine, *Saylan al-Rahim* encompasses various conditions, characterized by the accumulation of excessive waste material (*Fuzlaat*) in the uterus, weakening its retention power (*Zoef-e-quwate-masika*).
Materials And Methods: Scientific databases, publications and the information documented in the old unani texts, as well as the modern medicinal aspects of this gynecological problem.
Objective: The purpose of this review is to provide an overview of the traditional *Unani* and modern aspects of this gynecological problem regarding the causes, possible mechanism of the disease process and treatment options in the literature research.
Results: Despite advances in modern medicine, Unani scholars and ongoing research highlight the effectiveness of Unani singular medicines and compound formulations in treating leucorrhea (*Saylan al-Rahim*). When used under proper treatment guidelines, these traditional remedies have shown successful outcomes, demonstrating the value of integrating Unani principles into contemporary healthcare approaches.
Conclusion: The traditional unani treatment for *saylan al-rahim* (leucorrhea) is not only an option but a well-documented and clinically proved first line treatment to address this problem, until a specific reason for the use of antibiotics can be detected, to avoid not only the resistance to injudicious use of antibiotics but also to minimize the complications and frequent recurrences.

Keywords: Leucorrhea, *Saylan Al-Rahim,* Vaginal Secretions, *Zoef-e-quwate-masika, unani* system of medicine

INTRODUCTION

The International Conference on Population and Development (ICPD) in Canada defined reproductive health as a state of complete physical, mental, and social well- being in all matters relating to the reproductive

system and its functions and processes, rather than just the absence of sickness or illness. Despite being the ICPD's primary focus, reproductive health was left out of the advancement objectives**.**[1]The term leucorrhoea has been defined by Fleming as an excess of vaginal discharges of which the physical, chemical and bacteriological characteristics are not within the limits of normality or a vaginal discharge which is pathological in nature.[2] WHO has defined vaginal discharge syndrome as abnormal vaginal discharge (amount, color, and odor) with or without lower abdominal pain or specific symptoms or specific risk factors.[3] Leucorrhoea is a symptom of underlying pelvic pathology, it over shadows actual disease and women seek the treatment of only this symptom. Leucorrhoea is physiological when associated with various phases of menstrual cycle.[4]

The abnormal vaginal discharge may be whitish, yellowish, reddish and blackish in color. Women find it difficult to attend social events and even to carry out private affairs when they have foul-smelling vaginal discharge. The abnormal condition of the reproductive organs of women, if not treated in the initial stages, then it may become chronic and leads to PIDs (Pelvic Inflammatory Diseases), which may cause infertility.[5] The main causes of leucorrhoea include, local congestive states of pelvic organs such as pregnancy, prolapsed congested ovaries, chronic pelvic inflammatory diseases, chronic constipation, sedentary occupation, sexually transmitted diseases, unhygienic conditions, frequent abortions.[6] Renowned unani physicians described the causes of the disease as *du'f quwwat ghadhiya rahim* (poor nutritional faculty of the uterus) that causes accumulation of the waste products because of which, the uterine *quwwat jadhiba* (absorptive power), becomes weak and the excessive waste products are expelled out of the vagina or uterus as *istifragh* (excretion). This is mentioned in classical unani literature such as "*Kamil al-sana'a,"* [7] *"Firdaws al-hikma fi'l tibb,"* [8] and *"Tibb-i-akbar,"* [9]

Prevalence: Almost every fourth woman in Gynecological outpatient department has the complaint of vaginal discharge.[3,10] Many studies included different levels of society, reported that the prevalence of abnormal vaginal discharge as 12.1 to 30%. The complaint of vaginal discharge is very common, especially in South East Asia, where about a quarter of all adult women report this problem. Approximately, ten million office visits each year are attributed to vaginal discharge complaints.[10] Factors like increasing age, illiteracy, low socioeconomic status, high parity, induced abortions and place of delivery are all contributory for the occurrence of vaginal discharge**.**[11] Cases of vaginal discharge in the world are around 75% and in women on the European continent are 25%.[12]

Normal variants of vaginal discharge: Leucorrhea, also known as flour albus is a body discharge that is secreted from the genital organs of women excessively, that may be physiological or pathological. Physiological leucorrhea occurs according to menstruation process, usually transparent to whitish colored, and odorless.[13] It implies that only the amount of secretion is increased and there are no changes in physical characteristics. It commonly occurs due to hormonal imbalance during puberty, sexual excitement and at the time of ovulation. On examination of secretions no pathological organisms or pus cells are seen. Patient has no associated complaints like: itching, pain in abdomen, foul smell, frequency of micturition. The discharge may be translucent or whitish in color, no need to use pad, no history of sexual contact and the amount of discharge may vary in different phases of menstrual cycle**.** Examination reveals normal genitals with minimal odorless transparent vaginal discharge. Gynecologist must explain to her that it is normal physiological process and the secretions protect the skin or mucous membranes to keep them moist and prevent infection by making the medium acidic. [14]

Leucorrhea caused by estrogen stimulation is referred to as "physiologic leucorrhea." It may occur normally during pregnancy caused by increased blood flow to the vagina due to increased estrogen. Among post pubertal women, there is significant variation in vaginal discharge, and patients can be reassured that the discharge is normal in the absence of pain, pruritus, abnormal color, or odor. Vaginal discharge is a common complaint from girls who have reached puberty (stage III, sexual maturity rating.)[15] During the early neonatal period, maternal estrogens cause oestrogenisation of the genital tract of the female neonate. A mucoid vaginal discharge, often bloody, is not an uncommon finding in the first 14 days of life. The effects of estrogen begin to recede after two weeks. Any vaginal discharge or bleeding beyond two weeks warrants an investigation.[16]

Physiology of vagina: The mucosal surfaces of the female genital tract are coated with cervical mucus and cervical vaginal secretion. CVS that are that are inhibited by a vibrant microbial population. Microorganisms that try to invade the mucosal surfaces are repelled by them. However, some pathogens viz., C. albicans, T. vaginalis and G. vaginalis produce proteases and/or glycosidases. Mucins and host defence components in mucus can be broken down by these enzymes.[17]

Vaginal pH: The pH of the vagina usually ranges from 4 to 4.5. Lactobacillus species contribute by producing lactic acid, fatty acids, and other organic acids, though their exact role is still unknown. Anaerobic bacteria contribute by fermenting amino acids, and other bacteria can contribute organic acids from protein catabolism. Many species of the vaginal ecosystem rely on glycogen, which is found in healthy vaginal mucosa and is converted to lactic acid during metabolism (Boskey, 2001). Accordingly, as glycogen content within vaginal epithelial cells diminishes after menopause, this decreased substrate or acid production leads to a rise in vaginal pH. Specifically, if no pH-altering pathogens are present, a vaginal pH of 6.0 to 7.5 is strongly suggestive of menopause (Caillouette, 1997)[18]

Types of pathological vaginal discharges; A complex microbial environment comprising various species in varying quantities, primarily lactobacillus sp., which maintains a safe and healthy microenvironment, makes up the healthy vaginal tract of reproductive age women. Urogenital infections, such as AV, BV, TV, and VVC vaginitis, are caused by a disruption in this equilibrium.[17]

Bacterial Vaginosis: Although BV was first described in 1895, it was brought into focus as a major concern in women's genital health in the early 1980s. In the meantime, BV has not found a place in the core arsenal of syndromes that are treatable by physicians, nor has it been given a satisfactory pathophysiological explanation. Instead, BV is still, to this day, a disorder of unknown etiology, characterized by a foul smelling vaginal discharge, loss or reduction of the normal vaginal lactobacilli, and overgrowth of other anaerobic bacteria.[20] The most prevalent vaginal infection in the world, bacterial vaginosis (BV) is linked to significant public health problems like preterm labour and the acquisition and spread of sexually transmitted infections (STIs) and human immunodeficiency virus.[21] This common, complex, and poorly understood clinical syndrome reflects abnormal vaginal flora. It has been variously named, and former terms are Haemophilus vaginitis, Corynebacterium vaginitis, Gardnerella or anaerobic vaginitis, and nonspecific vaginitis.[18]

Table 1. Pathological vaginal discharges [19]

Pre-pubertal age;	**Reproductive age group;**
Causes of vulvo-vaginitis in prepubertal girl **Infective agents;** **Non-specific mixed bacterial flora (most common cause)**	**Infections;** **Non sexually;** • Candida sp. transmitted

• Group A beta Hemolytic streptococcus • Haemophilus influenza • Candida sp. (unusual) • Trichomonas vaginalis (acquired from mothers' genital tract at birth, if found in childhood suspect child abuse) **Chemicals and irritants;** • Soap, bubble bath • Prolonged contact with urine and feces • Clothing dye, perfume • Sand, dust • Foreign bodies	• Bacterial vaginosis • Group-B Streptococci (rare) **Sexually;** • Chlamydia trachomatis transmitted • Neisseria gonorrhea • Trichomonas vaginalis • Herpes simplex virus (associated cervicitis) **Non infective causes;** o Tumors o Foreign bodies o Allergy o Fistulae **Non sexually transmitted infections;** o Vulvo-vaginal candidiasis (VVC) o Bacterial vaginosis (BV) **Sexually transmitted infections;** o Trichomonas vaginalis (TV) o Neisseria gonorrhea (NG) o Chlamydia trachomatis (CT)

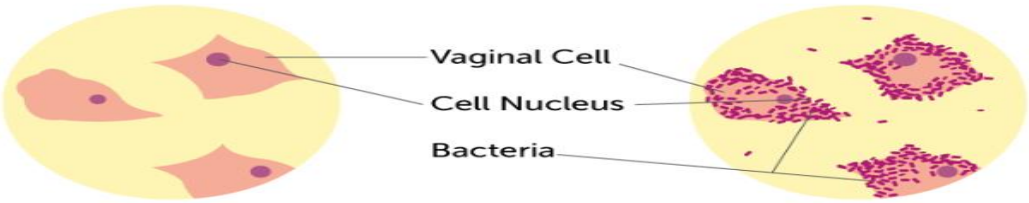
Pathophysiology: A diagnosis of bacterial vaginosis is suggested by the presence of "vaginal clue cells," which are squamous epithelial cells coated with the anaerobic gram-variable Gardnerella vaginalis and other anaerobic bacteria. The description and occurrence of clue cells have been consistent in the studies of bacterial vaginosis, and also recognized in the Amsel criteria, which is widely regarded as a highly effective tool in diagnosing bacterial vaginosis. Gardnerella species have been implicated in samples of cells coated with gram-variable bacilli. With advances in microbiological techniques, it has been possible to demonstrate, in non-specific vaginitis, a change of vaginal micro-flora, which forms the basis of the pathophysiology of the disease. Evidence has shown that a wide variety of pathogenic bacteria may be associated with this condition. These include mobiluncus, bacteroides species, peptostreptococci and Mycoplasma, as well as Gardnerella vaginalis, Urea plasma urealyticum, streptococcus viridans and atopobium vaginae.[22] The most common BV symptoms are a malodorous discharge and itching (Amsel et al., 1983), the odor, which is similar to the smell emanating from spoiled fish, is due to the release of amines, the same amines that are produced by the bacteria that spoil fish. In some people with BV, no symptoms are apparent.[20]

Table 2. Characteristics of Common Vaginal Infections.[18]

Category	complaint	Discharge	KOH "whiff test"	Vaginal pH	Microscopic Findings
Normal	None	White, clear	–	3.8-4.2	NA
BV	Odor, increased after intercourse and/or menses	Thin gray or white, adherent, often increased	–	>4.5	Clue cells, bacteria clumps (saline wet prep)
Candidiasis	Itching, burning, discharge	White, cloudy	–	<4.5	Hyphae and buds (10% KOH solution wet prep.
Trichomoniasis	Frothy discharge, odor, dysuria, pruritus,	Green-yellow, frothy, adherent, increased	±	>4.5	Motile trichomonads, saline prep.

	spotting				
Bacterial	Thin, watery discharge, pruritus	Purulent	–	>4.5	Many WBCs

Diagnosis: Bacterial vaginosis diagnosis is based on Amsel's criteria, with the need for the diagnosis, complying with three of the four following criteria: pH higher than 4.5; grayish and homogeneous vaginal discharge; positive amine discharge; and identification of clue cells in microscopic examination.[23] The Nugent score has replaced this diagnosis criterion. Both criteria can be associated, although the gold standard is the Nugent laboratory procedure, using Gram staining and objective score system, indicated as evidence. Gram-variable coccobacilli, Gram-negative curved bacilli, and lactobacilli are the three morphotypes to which a score is assigned in this evaluation. Gram-variable coccobacilli, Gram-negative curved bacilli, and lactobacilli are the three morphotypes to which a score is assigned in this evaluation. After the sum of all agents' scores, 7-10 indicates bacterial vaginosis, 4-6 is intermediate, and 0-3 is normal.[24]



Normal vaginal cells seen under a microscope **"Clue cells", vaginal cells with stucking bacteria**

Figure 1: Bacterial vaginosis [24]

Differential diagnosis; is carried out with candidiasis and trichomoniasis. As trichomoniasis is associated with severe hyperaemia of the vulva and vagina, observe the superficial focal flushing of the vulva in addition to the appearance of bright red spots on the mucous membranes of the cervix and the vaginal walls. Purulent cervicitis, erosion, or proliferative changes are noticeable when examining the cervix. The existence and type of the allocations during the review. Isolation: dense, numerous, whitish in colour, frequently associated with candidiasis; yellowish or greenish-gray, foamy, frequently odorous, found in conjunction with trichomoniasis.[23]

Table 3: Bacterial Vaginosis management [18]

Single-agent Bacterial Vaginosis Treatment
Recommended regimens; ○ Metronidazole, 500 mg two times daily for 7 days orally ○ Metronidazole gel 0.75%, 5 g (1 full applicator) intravaginally once daily for 5 days ○ Clindamycin cream 2%, 5g (1 full applicator) intravaginally at bedtime for 7 days
Alternative regimens; ○ Tinidazole, 2g orally once daily for 2 days ○ Clindamycin, 1 g orally once daily for 5 days, 300 mg orally twice daily for 7 days ○ Clindamycin ovules, 100 mg intravaginally at bedtime for 3 days

Vulvovaginal candidiasis (VVC):

Prevalence; A variety of Candida sp. strains can cause vulvovaginal candidiasis, an infection of the vulva and vagina. This condition affects 75% of all women at least once in their lifetime, occurring more frequently during their childbearing years.[25] One of the most typical vaginal infections among women during their reproductive years is vaginal candidiasis, which is also the most common fungal illness ever documented. Vaginal candidiasis was frequently disregarded as a minor pathology until recently. In addition, many psychological and emotional stress related problems are also explored to be associated with vaginitis like decreased immunity, prolonged antibiotic therapy, use of contraceptives, malnutrition, pregnancy, diabetes, obesity, tissue transplant, use of immunosuppressive agents, neutropenia etc. Nearly half of women suffer from multiple episodes of vulvovaginal candidiasis, and approximately two thirds of women experience the condition at least once in their lifetime. Candida albicans is recognised as the causative agent of most cases of vulvovaginal candidiasis and the frequency of episodes caused by other candida species other than albicans is also on rise.[26]

Vulvovaginal candidiasis, is an exceedingly common mucosal infection of the lower female reproductive tract (FRT), caused mostly by the polymorphic opportunistic fungus Candida albicans. A member of the normal human microbiota, C. albicans commonly colonizes the vaginal lumen asymptomatically. However, virulence effector production and exuberant mucosal inflammation, which is mainly brought on by fungal overgrowth in the vagina, can lead to symptomatic infection.[27] Complex interactions between fungal biology, host physiology, and the immune system control the symptoms of Candida vaginitis. (Figure 2)

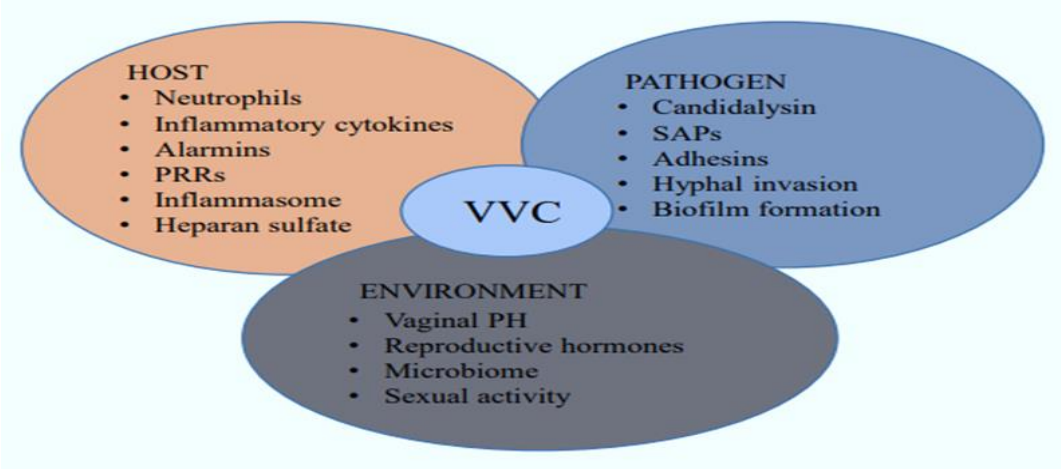


Figure 2. Vulvovaginal candidiasis (VVC) is a multifactorial disease. Multiple inputs from host (blue), pathogen (red), and environment (yellow) are required to drive disease onset and symptomatic infection. Each circle represents major contributing factors to the immune pathogenesis of VVC.[27]

Diagnosis: The simplest way of investigation is the analysis under microscope of the fresh vaginal content for which the material is collected from the vaginal wall and placed on the plate, 1-2 drops of saline or 10% potassium hydroxide for better evidencing morphotypes of yeasts are added, but the same should be confirmed by laboratory examinations. In addition to this examination, the Gram-stained vaginal smear bacterioscopy is another easy and affordable method. When recurrent candidiasis occurs, a vaginal sample may need to be cultured for fungi (using Sabouraud, Nickerson's, or Microstix-Candida media) in order to identify the species of fungus. For a differential diagnosis of recurrent vulvovaginal

candidiasis, importantly consider lichen sclerosus, vulvar vestibulitis, vulvar dermatitis, vulvodynia, cytolytic vaginitis, desquamative inflammatory vaginitis, atypical forms of genital herpes, and hypersensitivity reactions.[24]

Figure 3. Vulvovaginal candidiasis: [28]

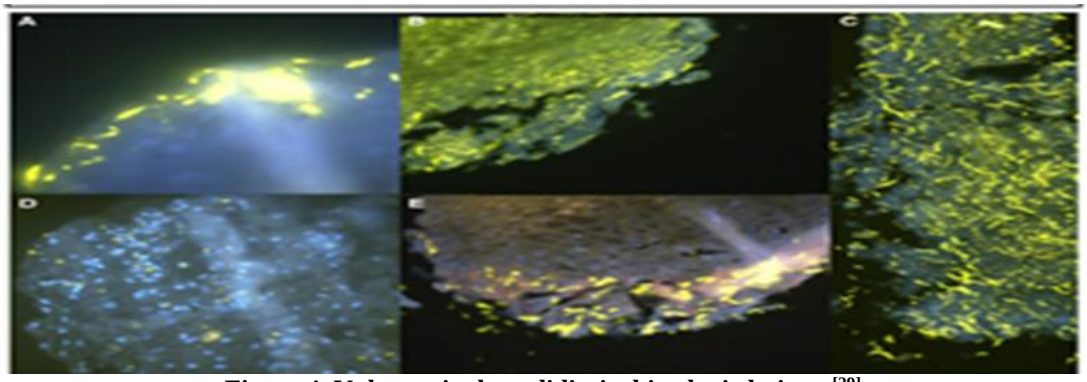


Figure 4. Vulvovaginal candidiasis: histologic lesions:[29]

Table 4. Recommended Regimens for Treatment of Vulvovaginal Candidiasis. [30]

Regimen and Dosing	
Over the counter intravaginal agents	**Prescription intravaginal agents**
• Clotrimazole 1% cream; 5g intravaginally daily for 7-14 days • Clotrimazole 2% cream; 5g intravaginally daily for 3 days • Miconazole 2% cream; 5g intravaginally daily for 7 days • Miconazole 4% cream; 5g intravaginally daily for 3 days • Miconazole 100 mg vaginal suppository; One suppository daily for 7 days • Miconazole 200 mg vaginal Suppository; One/day for 3 days • Miconazole 1200 mg vaginal Suppository; One suppository for 1 day • Tinidazole 6.5% ointment;5g intravaginally in a single application	• Butoconazole 2% cream (single dose bio adhesive product); 5g intravaginally in a single application • Terconazole 0.4% Cream; 5g intravaginally daily for 7 days • Terconazole 0.8% cream; 5g intravaginally daily for 3 days • Terconazole 80 mg vaginal suppository; 1daily for 3 days
• **Oral agents:** Fluconazole 150 Single dose.	

Trichomoniasis: In 1986 a French doctor and microbiologist Alfred F discovered T. Vaginalis. Donné; in 1916, Hoehne showed the TV was responsable for producing vaginitis. TV belongs to the Trichomonadidae family. Different types of Trichomonas can be found in humans: T. hominis, T. tenax, T. vaginalis and Pentatricomonas hominis. The T. hominis is found in the intestines, the T. tenax in the mouth, the Ptv in the intestines and TV in the vagina and urethra and parasitize the urogenital area of both genders.[.31] TV is likely the most common non-viral sexually transmitted infection (STI) in the world. While not a reportable disease, the World Health Organization estimated that there were 276.4 million cases in 2008 and nearly 90 % of these infections occurred among people living in resource-limited settings. TV is more prevalent than Chlamydia trachomatis, Neisseria gonorrhoeae, and syphilis combined. The global prevalence of TV has been estimated at 8.1 % for women and 1.0 % for men. These rates could be underestimated because there are no official surveillance systems in place and they are based on studies that used microscopy rather than the more sensitive nucleic acid amplification tests (NAAT).[32]

Trichomoniasis generally refers to infection of the genitourinary tract by the flagellate protozoon. Trichomoniasis also applies to infection of the intestinal tract by Trichomonas hominis (Pentatrichomonas hominis) and infection of the oral cavity by Trichomonas tenax (Trichomonas buccalis and Trichomonas elongata). Trichomonas hominis and T. tenax are usually considered nonpathogenic in humans.[33]

Pathobiology/Pathophysiology:

Trichomonas vaginalis (TV) has an incubation period of 4-28 days. It primarily affects the squamous epithelium of the urogenital tracts in both men and women. TV replicates through binary fission and is found in the male urethra and prostate, as well as the female lower urogenital tract, including the vagina and urethra. The primary mode of transmission among humans, the only known host, is through sexual intercourse. In females, the infection can persist for months or even years, whereas in males, it typically resolves within ten days. It can survive outside the human body for over three hours in a moist environment. However, it does not appear to have a cyst form and is not well-suited to the external environment. Trichomonas vaginalis (TV) can be infected with double-stranded RNA (dsRNA) viruses, which may have significant implications for trichomonal virulence and disease. In its physiological niche, the urogenital tract, TV must adapt to various stressors, including pH fluctuations, iron and nutrient imbalances, and vaginal epithelial cell desquamation linked to the menstrual cycle. The parasite can reside in the female urethra and re-infect the cervicovaginal segment in response to pH changes. TV cannot survive in acidic environments and is eliminated from the vagina when lactobacilli return. However, the parasite in the urethra re-invades the vagina before menstruation (pH 7.5) leading to reinfection without ongoing therapy. TV attaches to the cervicovaginal cell wall, using a potent enzyme system to disrupt host metabolism, producing toxins that can cause cell necrosis. The parasite requires minimal energy, obtained from glycolysis of cellular glycogen. TV, like other parasitic protozoans, displays complex carbohydrates (glycolipids, glycoproteins, and lipid-anchored GPI) on its surface, enabling it to evade host immune responses and invade host cells. [31]

Signs and symptoms of trichomoniasis: Approximately 70% of those who are infected show no symptoms at all. When symptoms of trichomoniasis do occur, they can vary in severity from minor irritation to intense inflammation. Some individuals develop symptoms 5 to 28 days after infection and others don't experience so for a very long time. Men who have trichomoniasis may experience burning after urinating or ejaculating, discharge from the penis, and internal itching or irritation. The following symptoms of trichomoniasis in

women: burning, itching, redness, or soreness in the genitalia, and difficulty urinating, a shift in the consistency of their vaginal discharge, which can be clear, white, yellowish, greenish, or have an odd fishy smell. Having sex can be uncomfortable if you have trichomoniasis. If left untreated, the infection can last longer.[34] The majority of women (85 %) and men (77 %) with TV are asymptomatic. Within six months, one-third of asymptomatic women develop symptoms. Women often get infections in the urethra, endocervix, and vagina.The normal vaginal pH is 4.5, but with TV infection this increases markedly, often to >5. Coplitis macularis or straw- berry cervix is seen in about 5 % of women, though with colposcopy this rises to nearly 50 %. Infections of the adnexa, endometrium, Skene, and bartholin glands are additional complications. It can lead to decreased motility of sperm cells, prostatitis, and epididymitis in men.[32]

Diagnosis: Point-of-care tests, culture, and wet prep microscopy/amine test can all be used to make the diagnosis. **A.** Wet Prep Microscopy (60–70% sensitivity; for women use only). Multiple, mobile trichomonads—pear-shaped protozoa with motile flagella that move between non-motile cells—are seen. Presence of increased quantity of WBCs. Positive "whiff" test (fishy amine odor from vaginal fluid mixed with 10% KOH). **B.** Point-of-Care Diagnostics. Positive OSOM Trich Rapid Test (vaginal swab). Positive Affirm (vaginal swab) **C.** Culture testing. Positive APTIMA. Positive Amplicor (vaginal swab or urine). While a definitive diagnosis is established through the observation of motile trichomonads on a wet mount. Client preference for/against wet mount testing should be considered and provider judgment is encouraged in these cases.[35] The current pattern of diagnosis test for vulvovaginitis depends on the structure available at the place of attendance. Most of the diagnoses are conducted empirically and based on clinics, although the availability of a microscope for fresh examination is an important supplementary examination. Molecular tests directed to bacterial vaginosis diagnosis, Candida sp. and T. vaginalis can improve diagnostic accuracy and reduce result time compared to culture. This can be especially important for bacterial vaginosis, which encompasses multiple organisms in vaginal microbiota.[24]

Table 5: Overview and characteristics of diagnostic assays for Trichomonas vaginalia [36]

Overview and characteristics of diagnostic assays for Trichomonas vaginalia						
Diagnostic test	**Technique**	**Time to result**	**Specimen type**	**Sensitivity (with 95% CI)**	**Specificity (with 95% CI)**	**Comments**
Wet mount	Microscopic visualization	Minutes	Vaginal or urethral secretions	36-70%	98.8-100%	Traditional, inexpensive, operater-dependant, must be done within minutes
Culture (diamonds or in pouch)	Culture	1-5 days	Vaginal or urethral swab; urine F, semen	75-95%	100%	Diagnostic gold standard before NAATs
OSOM tricomoniasis rapid test	EIA	Minutes	Vaginal swabs, saline solution for wet mount prep.	75-96%	95-99%	FDA cleared and CLIA waived
Affirm VP III	Nucleic acid probe test	Minutes	Vaginal swab	89.2-92.8%	98.1-99.9%	FDA cleared, can be used at the point of CLIA moderately complex

Amplvue trichomonas	NAAT	Minutes	Vaginal swab (CC)	100%	98.2%	FDA cleared, CLIA moderately complex
Aptima TV (panther)	NAAT	Hours	Vaginal (CC), endocervical (CC) swab, endocervical specimen in preserv-cyt solution	95.2-100%	98.9-99.6%	FDA cleared, CLIA moderately complex
Aptima TV (Tigris)	NAAT	Hours	Vaginal (CC), endocervical (CC) swab, endocervical specimen in preserv-cyt solution, urine (F)	95.2-100%	98.9-99.6%	FDA cleared, CLIA moderately complex
BD MAX CT/GC/TV Assay	NAAT	Hours	Vaginal (SC), endocervical (CC) swab, urine F	92.9-96.1%	992.9-96.1%	FDA cleared, CLIA moderately complex
Solana trichomonas	NAAT	Minutes	Vaginal swab (CC), urine F	95.5-98.3%	98.2-98.7%	FDA cleared, CLIA moderately complex
TVQ Amplified DNA	NAAT	Hours	Vaginal (SC), endocervical (CC) swab, urine F	95.5-98.3%	98.7-99.4%	FDA cleared, CLIA moderately complex
Xpert TV	NAAT	Minutes	Vaginal (SC), endocervical (CC) swab, urine F	96.4-98.9%	98.6-99.7%	FDA cleared, CLIA moderately complex
EIA; Enzyme immunoassay, NAAT; nucleic acid amplification test. SC; self-collected. CC; clinician-collected. F; female						

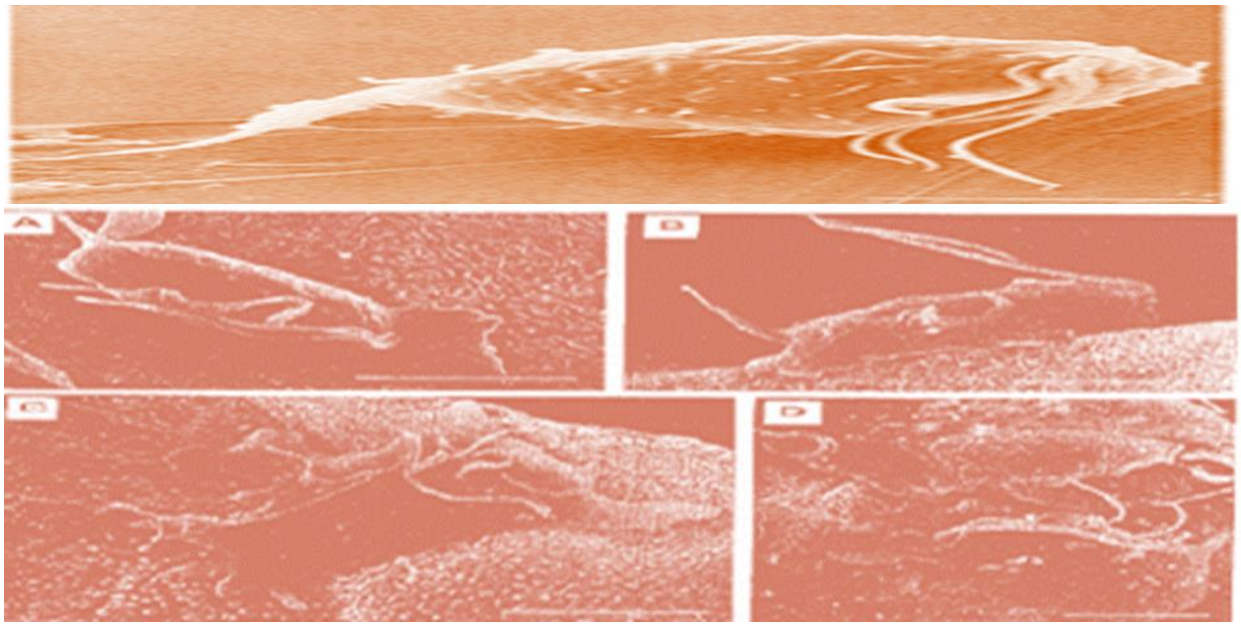


Fig 5: T. Vaginalis parasite as seen in broth culture (petrin et al. 1996) and Rapid amoeboid transformation of T. Vaginalis during cysto-adherence Arroyo et al. 1993.[37]

Treatment: A permanent cure necessitates systemic antibiotic therapy with nitroimidazoles because infection of the urethra and paraurethral glands, in addition to the vagina, occurs frequently.

Recommended regimen (Grade 1A): Metronidazole 400–500 mg twice daily for 7 days

Pregnancy and breast feeding: 400 mg oral metronidazole twice daily for 7 days in preference to the use of short high-dose regimens which are not recommended during pregnancy (Grade 1A).

People living with HIV: (Grade 1A) The recommended treatment regimen should also be used in those living with HIV. According to a randomized clinical trial, women with HIV who had trichomoniasis responded better to 500 mg of metronidazole taken twice daily for seven days than to a single oral dose of 2 g of metronidazole.

Higher dose course of Nitroimidazole (Grade 2B) Sherrard et al. • Metronidazole 2 g daily for 5–7 days or • Metronidazole 800 mg three times daily for 7 days - in those who failed to respond to a second course of treatment, 70% responded to a higher dose course of metronidazole.[38]

Other causes of leucorrhoea: Foreign bodies, vulvar vestibulitis, and allergic vaginitis are non-infectious conditions that can lead to vaginitis. Inflammation from a foreign object, such as toilet paper or tampons, results in excess discharge and odor. Vestibulitis occurs when acidic vaginal discharges irritate vestibular tissue, causing burning and pain during intercourse. Common causes of non-infectious vaginitis include irritant and allergic contact dermatitis from genital hygiene products and contraceptives. Other non-infectious cervical disorders include cervical ectopy, mucous polyps, chronic cervicitis, and ectropion. [39]

Table 6: Brazilian Protocol for Sexually Transmitted Infectious 2020

Clinical condition	Treatment	Remarks
Vulvovaginal candidiasis		
First option	2% Miconazole cream or other imidazole derivatives vaginal route, one full applicator at night when going to bed for seven days OR IU 100.00 Nystatin one application vaginal route, when going to bed or 14 days.	Sexual partners do not need to be treated except symptomatic ones. It is common during pregnancy. It can recur due to the favorable conditions of vaginal pH in this period. Treatment in pregnant and breastfeeding women, only the vaginal route. Oral treatment and using triazoles are unrecommende.
Second option	Fluconazole 150 mg, (PO) single dose OR Itraconazole 100 mg. pills, PO. Twice/day, for one day	
Complicated and recurrent vulvovaginal candidiasis	Induction: Fluconazole 15Omg. PO once/day. in days1,4and7 OR Itraconazole 10Omg. two pills PO twice/day for one day OR Miconazole topical vaginal cream daily for 10-14 days **Maintenance:** fluconazole 150mg, once once/week for six months OR Miconazole topical vaginal cream twice/week OR Miconazole vaginal once/week for six months	
Bacterial vaginosis		
The first option	Metronidazole 250 mg. two pills PO twice/day	Treatment of sexual partner is not

(including pregnant and breastfeeding women)	for seven days OR Metronidazole cream, vaginal use 10Omg/d at night when going to bed, one full applicator for five days	recommended. For postpartum women we recommend same as pregnant women.
2nd option	Clindamycin 300mg. PO, twice/day. for seven days	
Recurrent	Metronidazole 250mg, two pills PO twice day for 10-14 days. Metronidazole cream, vaginal use 10Omg/d one full applicator vaginal route. Once/day, followed by suppressive treatment with intra vaginal boric acid of 600mg/day for 21 days and metronidazole vaginal use 100mg twice/week for 4-6 months.	The treatment of sexual partners is not recommended. For postpartum women same as pregnant.
Trichomonas infections		
The first option, including pregnant and breast feeding women	Metronidazole 400mg. 5 pills PO, single dose (total doses 2g) OR Metronidazole 250mg, two pills/day, PO. Twice/day, for seven days	Sexual Partners must be treated with the same therapy scheme. The treatment can assess symptoms of vaginal discharge in pregnant women and prevent infection in newborns.
		For postpartum women we recommend the same treatment as pregnant women

Source: adapted from the clinical protocol and therapeutic guidelines for comprehensive health care for people with sexually transmitted infections, 2020. Treatment of vulvovaginal candidiasis, bacterial vaginosis and trichomonas infections. [24]

Unani* concept of *Sayalan al-Rahim: Within the *Unani* System of Medicine (USM), *sayalan al-rahim* encompasses all conditions that are currently classified under various names in modern medicine, such as gonococcal cervicitis, trichomoniasis, moniliasis, or bacterial vaginosis. In *Sayalan al-Rahim*, the uterus accumulates excessive waste material (*Fuzlaa*t) as a result of weakened repulsive power (*Zoef-e-quwate-dafea*). *Sayalan al-Rahim* is thus the resultant excretory waste of the uterus, happens as a result of amenorrhoea (*Ahtibas tamath*), anemia (*Qilat wa rikkate-e-khoon*), amenorrhea (*Badani zauf*), irregular and disproportionate distribution of humors (*Akhlat*), especially phlegm (*Balgham*). Phlegm humor is a type of mucus secreted from the vagina (*Balghami khilt*). All of this causes the nutritional faculty (*quwwat-e-gadhia*) to weaken, which in turn affects the vaginal lining and ultimately leads to excessive vaginal discharge.[40]

According to Ibn Sina, *sayalan al-rahim* is an infected discharge that emerges from the uterus, while *saylan al-mani* is an overabundance of regular discharge that occasionally emerges from the uterus. Additionally, he said that while some discharge is normal during sexual arousal, discharge without arousal occurs when weakness *quwwat-e-hadima Rahim* is the cause of the discharge.[41] This *sayalan*, according to Ibn Hubal Baghdadi, is an execratory waste product of the uterus or the body expelled from the uterus. It is typically *balghami* and has a viscous or watery consistency.[42] According to Ajmal Khan *Sayalan al-Rahim*, is a disease that negatively impacts the heart, brain, liver, and other essential organs as well as women's fertility.[43] Akbar Arzani said that fluid is secreted from the uterus as a result

of poor *Quwwat ghadhiya*.[9] *Sayalan al rahim*, according to Majoosi, is a discharge from the uterus that is either generated naturally by the organ due to its poor capacity for absorption (*Quwwat e Jadhiba*) or it is bodily waste that is directed towards the uterus in order to be expelled in order to cleanse the body.[7] According to Razi, it is the excess bodily fluid that the body expels.[44] *Saylan al-rahim*, as described by Hasan Qarshi, is the term for the secretions secreted by the mucous membrane of the uterus and vagina, and it contains vaginal cells.[45]

Mutradif Naam: **(Synonyms)** *Safaid rutubat, Safaid palu,* [45] *Safaid pani ka aana,* [46, 47] leucorhea.[48]

Definition; It is described as a condition wherein abnormal discharge other than blood is expelled from the cervix, vagina, and uterus. It is a discharge from the uterus that is infected.[41] It carries out the entire body's *tanqiya* as *istifragh tabi'i*.[44] *Rutubat ufuni*, which is caused by a weakness in the *Rahim's* (uterus's) digestive power, exits the body as *saylan al-rahim.*[49]

***Asbaab*: (Etiology)**

- *Du'f quwwat jadhiba rahim,*
- *Du'f quwwat ghadiya rahim* and
- *Du'f quwwat masika* (decreased uterine absorptive, nutritive and retentive power respectively.)[8]

Ufunat, Excessive *rutubat* in the body, Excessive *fuzlat* (waste material) of whole body or *rahim, Ghalaba-i-akhlate-arb'a* (predominance of all 4 humors)[7,42,50,,51] There are a few potential reasons why these physiological parameters could change, including *waram indame nihani* (vaginitis)[43,46] *inqilab al rahim/ nutu al rahim* (uterine prolapse)[43,45,46] *waram al rahim* (metritis), *atshak* (syphilis), *hurqa al-nisa* (gonorrhea), generalized weakness (*du'f a'am*),[43,45,46,47] early pregnancy [43,45,46,47,52] *niqris* (gout) [43,45,46] *waja al-mufassil* (arthritis), *diqq* (tuberculosis) [45,46] *buthur al-rahim, quruh al-rahim, bawasir al-rahim, su al-qinya* (anemia) [43,45,46,47] excessive intake of cold and moist foods, [43] amenorrhea [43,46,47]

Predisposing factors: Unsanitary circumstances, particularly during menstruation, low socioeconomic standing, and *kathrath milaap* (frequent sexual intimacy),[47] cases of *kathrat-i-isqat*, or frequent abortions, anaemia (*faqr al-dam*), worm infestation (*didan al-am'a*), chronic constipation (*qabd muzmin*), and amenorrhoea (*ihtibas al-tamath*) [47] *nafsiyati dabav* [mental stress], *ishal* (diarrhoea), and *zahir* (dysentery) [47, 53]

***Mahiyatul Marz* (Pathophysiology):** In *Sayalan Al-Rahim, quwwat al-ghadhia* is affected by *su-i-mizaj,* which affects the uterus. *Quwwat masika,* or retentive power, is what is still present at the receiving end primarily and loses its ability to keep the nutrients in the uterus for long enough for the *quwwat hadima* to act upon them and transform them into the right nutrients for absorption. The *hararat-e-ghariziyya* are subdued by this adverse material. During this process, the uterus is overpowered by *hararat-e-ghariba*, which then turns the buildup of uterine waste into infected material. This abnormal substance has an irritating nature, can lead to ulcers when it builds up, particularly in the cervix, and can burn and irritate the body when it exits the body. *Sayalan al-rahim* is the term for this excessive and contaminated material that emerges from the genital tract.[7,51,53]

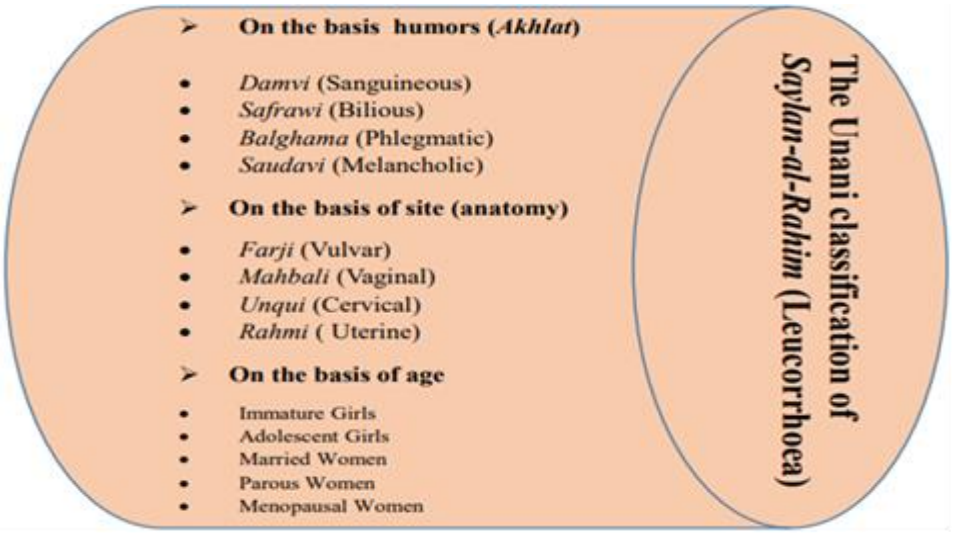


Fig 6: Showing the *Unani* classification of *Saylan-ur-Rahem* (Leucorrhoea)[40]

According to the character of the discharge: In young women, discharge is viscous and shiny and on examination it is adherent to labia. In newly wed, nulliparous and menopausal women, it is just like egg white but it is less viscous and is associated with itching and burning. In old age women the discharge resembles cheese and viscid in consistency and is common in this age, if it turns like egg yolk requires treatment.[43] in multiparous women, discharge is like egg white but sometimes mixed with blood and pus.[43,46,47]

Clinical features; the main symptom is the discharge of excessive fluid discharge which can be thin, thick, viscous, yellowish white. The other associated symptoms are; *hikka al-mahbil* (pruritus vulva) [43,45,46,47] *waja'al-zahr* (backache)[43,45,46,47,48] *usr al-tamath* (dysmenorrhea),[43,46,47] *qabd* (constipation), [45] *usr al-bawl* (dysuria),[52] *du'f hadim* (indigestion),[48] *du'f a'am* (general weakness) [43,45,46,47,48] *kathrat al-bawl* (increased frequency of micturition), [43,45,46,47] pallor, [9,41,45,46,50] puffiness around eyes,[9,41,49,50] *du'f al-ishtiha'* (loss of appetite)[9,41,43,45,49,50] laboured breathing [41,49,50] headache.[48]

***Awarizaat*: (Complications)** *uqr, isqaat and diqq*.[48]

***Tashkhees* (Diagnosis):** The cause of *sayalan al-rahim* is a predominance of either of the *khilt* that can be diagnosed with the help of a swab. The patient is asked to keep overnight a sterile tampon into her vagina and remove the same next morning and dry up in the shade to describe the predominant involved *khilt* by its color. If the color of the discharge is white and associated with lethargy then it is of the *khilt-i-balgham*. If red then indicates the predominance of *khilt-i-dam* [blood]. In *khilt-i-safra* the color will be *ahmar naseh* or *zaffrani* and associated with polydipsia and the black color associated with dryness and weakness is the indication of khilt-*i-sawda*.[7,41,50]

Tashkhees-i-fariqa* (Differential diagnosis): *Sayalan al-mani*:** Yellowish-white, thick, non-offensive with a characteristic order.[45] ***Bawasir al-rahim*:** Reddish or blackish with associated symptoms.[45] ***Buthur al-rahim: Scanty, yellowish or reddish. Burning sensation and irritation are present.[45] ***Sartan al-rahim***: Like meat water or black with a foul smell. ***Quruh al-rahim***: Thick yellowish pus-like. ***Hurqa***: Thick foul smelling.[45]

Principles of treatment: To identify the causing *khilt* and make possible to balance the *ikhlat* by modifying the characteristics of the offending one. In *waram al-rahim* local application of *marham dakhliyoon* 10gm, *Aab Kasni Sabz* 10gm, *Aab Mako Sabz* 10gm and add *Roghane Gul* 6gm and *Safedi Bayda Murgh* 1 piece per vaginum.

Give *muqawwiyat* to improve the general health and maintain the perineal hygiene.[43] *Mundij Wa Mushil* as per the dominant *khilt* causing the disease and if caused by vaginal infection the morbid *khilt* should be eliminated from the stomach and liver.[52]

***Ilaj bi'l-tadbir*:** Avoid strenuous exercise,[43] heavy weight lifting,[43,45,46] and maintain perineal hygiene.[46]

***Ilaj bi,l ghida* (dietary recommendations):**

- Proper diets are assumed to produce good *khilt* and improper diet will produce *Radi'khilt* as stated by Ibn Rushd.[54] Patient should be advised *Muqawwt Ghadha* to strengthen *Quwwat Ghadhiya*.[50]
- Rice, milk and fruits should be avoided in case of *Ghalaba-i-Balgham* and also *baadi* and *saqeel* foods.[42]
- Extremely hot, spicy, oily and sour foods should be avoided.[43,45]
- Kabir al-Din advised taking *Muqawwat Aghdiya like shorba, Bayda Nim Barsht*, Chapati, *Qorma* and milk.[55]
- Qarshi advised taking *Shorba Bakri*, Chappati, Moong ki Daal and vegetables.[45]

Ilaj bi;l-Dawa:

Oral: single drugs;

- Powder of *Murmakki* 2gm for consecutive 3 days with a half-boiled egg on empty stomach.[7]
- Powder of dried *Post Molsari* with an equal amount of sugar is advised in the morning, [50]
- *Kakrasingi* powder with sugar with water or milk.[50]

Compound formulations:

- *Taj, Majeeth, Gul pista, Kharkhasak, Gond Dhak, Mazu Sabz, Nakhood biryani* 12gm each with an equal amount of sugar, 7gm /day with water.[45]
- Powder of, *Talmakhana, Beejband, Gul Dhawa, Gule Supari, Gule pista, post beroon pista* each 4gm, *Maghz Tukhme Tamarhindi biryaan, Salab Misri, Arde Moong biryaan,* each 10gm and *mastagi* 3gm and equal amount of sugar with *Arq Gauzabaan* 100ml /day.[46]
- Fine powder of *Mochras, Samagh Arbi, Gul Dhawa, Gul Fofil,* and *Molsari* 6gm each, *Nabat Safed* 200gm in the dose of 6gm daily with water [43,45,46]
- Fine powder of each, *Sang Jarahat, Mazu Sabz, Nakhood biryani* 10gm and *Misri* 20gm, in the dose of 7gm/day morning with wate

Local applications:

- *Abzan* (stiz bath) with decoction of *Samar Mughilan* followed by its *Hamul* [50]
- *Mazu* is soaked in *sharab* or *Simaq* with honey and used as *Firzaja*
- A decoction of *Baloot Kofta* or *Nardeen* as *huqna.*[50]
- *Hamul or pichkari* made of *Phitkari biryaan, Mazu biryaan* 2gm each and *Kath Safed* 4gm boiled in 250 ML of water.[43,45,47]
- *Hamul* of powderd *Aqaqia, Gul anar, Mazu Sabz* 7gm each, *Phitkari, Sumulut tib,* 3gm each.[43,47]
- 4.5gm powder of each, *Juft Baloot, kharnoob, Mazu Sabz, Izfar Tib, Aqaqiya, Sandal Safaid, Barg Morad*, with *Roghan Ood Hindi* 1gm, as *Farzaja* [50]

Ready to use compound formulations:

- *Majun Muqawwi Rahim, Majun Suhaga Sonth, Qurs Saylan al-rahim, Habb-i-Marwareed,*[43,53] *Safufi-i-Saylan al rahim,* [47,53] *Majun Supari Pak, Kushta Musallas* [44,49,54] *Majun Mochras, Kushta Bayda Murgh, Qurs Khusta Khabsul Hadeed, Kushta Qalai* [43,47,53] and *Sharbat Habbul Aas* [53].

CONCLUSION

Vaginal discharge is an uncomfortable and individualized symptom, some women find that a less frequent discharge bothers them, while others consider a more frequent discharge to be typical and could be a

woman's presenting symptom. It is considered that changes in the vaginal epithelium; changes in the normal bacterial flora and pH of the vaginal secretion predispose to leucorrhoea. Genital tract infections are one of the main causes of illness in developing nations, and they can be brought on by any one of the three main causes—iatrogenic, endogenous, or sexually transmitted—or by a combination of them. The discharge changes color from whitish to yellow or light green and has an unpleasant odor. It is important to identify the cause or causes of the excessive discharge per vaginum for proper treatment. Physiological leucorrhea does not need any medical treatment, only assurance and counselling is required. In unani system of medicine *sayalan al-rahim* is vastly described and it mostly covers all the types that were described in conventional medicine and the treatment is widely described for all these types with good outcomes and provides a good substitute if taken as per the proper advice and recommendations. The use of antimicrobial agents should be considered as a last priority after proper culture and sensitivity to avoid resistance to these antimicrobial agents.

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Abbreviation: USM- *Uanani* system of medicine, (ICPD) International Conference on Population and Development, PIDs (Pelvic Inflammatory Diseases), (CVS) cervical vaginal secretion, AV- Aerobic vaginitis, BV- Bacterial vaginosis, TV- Trichomonas vaginalis and VVC- Vulvovaginal candidiasis, (STIs) sexually transmitted infections, POCT-devices (point of care testing), (FRT) female reproductive tract, PRRs- pattern recognition receptors, SAPs- secreted aspartyl proteinases, (NAAT) nucleic acid amplification tests, (GPI) glycosylated phosphatidylinositol, OSOM (one step on site monitoring)

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