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Original Research

Assessment of Body and Uterine Dystemperaments Based on Persian Medicine in Patients with Bacterial Vaginosis: A Cross-Sectional Study

Mitra Esmaili[1]*, Zohreh Salari[2]

[1] School of Medical Sciences, Sirjan University of Medical Sciences, Sirjan, Iran
[2]Obstetrics and Gynecology Center, Afzalipour School of Medicine, Kerman University of Medical Sciences, Kerman, Iran

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Abstract

Bacterial vaginosis characterized by the loss of normal vaginal flora and the overgrowth of anaerobic bacteria. Complementary and alternative medicine is often used to help with bacterial vaginosis. In Persian medicine, a person's temperament is very important for diagnosing and treating health issues. This study aimed to assess the body and uterus dystemperaments in patients with bacterial vaginosis. This cross-sectional study was done on 90 married women 18-50 years of age suffering from bacterial vaginosis. To determine the general temperament of the body, Mojahedi questionnaire was employed. For specifying the uterus temperament, standard uterus temperament determination questionnaire was employed. Data were analyzed by descriptive statistics, as well as inferential statistics through SPSS 24 software. The results showed most patients with bacterial vaginosis had a hot and wet body temperament. Based on the data, in the present sample, less abortion is seen among those with a hot temperament (p=0.04). Also, examination of the uterine temperament in patient with bacterial vaginosis showed most patient had cold and wet temperament. Specifically, 83.3% of the patients had a cold uterine temperament; whereas 16.7% displayed a hot uterine temperament. Regarding moisture, 64.4% had wet, 10.0% had balanced, and 25.6% had dry uterus temperament. According to the results, most patients with bacterial vaginosis showed cold and wet uterus dystemperament. This might suggest there is a connection between the uterus dystemperament and the bacterial vaginosis risk; therefore, more research is needed in integrative health methods.

Keywords: Persian medicine; Complementary and alternative medicine; Genital infection; Vaginitis

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*Corresponding Author: Mitra Esmaili
School of Medical Sciences, Sirjan University of Medical Sciences, Sirjan, Iran
Email: mitraesmaili77@yahoo.com

Introduction

Various gynecological infections can affect the sexual health in reproductive-age women, the most common of which being bacterial vaginosis (BV) [1]. This infection occurs in the female genital system, where the bacteria in the vaginal microbiota, typically Lactobacilli, undergo a transformation into anaerobic pathogenic bacteria such as *Gardnerella* [2]. Diagnosis of this medical condition is characterized by manifestations of inflammation in the vaginal mucosa, including vaginal discharge, pruritus, and a sensation of burning [3]. The possibility of acquiring BV in reproductive age women ranges from 4% in women without symptoms to 61% in women seeking care at sexually transmitted diseases clinics [4].

Generally, research indicates that the recurrence of BV has a detrimental impact on the social and personal aspects of women's lives, in addition to their occupational interactions, ultimately resulting in a significant decline in their quality of life [5]. Furthermore, studies propose that the symptoms experienced in the vaginal region can induce intense feelings of unease and psychological anguish for women, thereby influencing their social and sexual connections [6]. In contemporary medical practices, antibiotics such as metronidazole or clindamycin are employed in the treatment of this ailment; though, they are associated with therapeutic ineffectiveness or disease recurrence [7].

Therefore, the use of alternate approaches to therapy is necessary. Complementary and alternative medicine (CAM) is regarded as a viable and advantageous modality for addressing various diseases in conjunction with conventional medicine. Recently, there has been a noticeable growing tendency to using CAM [8]. The integration of CAM into the contemporary medical services and healthcare system of nations is emphasized by the World Health Organization (WHO) [9]. Persian medicine (PM), renowned as a comprehensive medical system, has long been regarded as an exemplary embodiment of traditional medicine [10].

According to *al-Qanun fi al-Tibb* (Ibn Sina), the objective of medicine is to maintain one's well-being and, in the event of its decline, the reinstatement thereof. The PM system endeavors to provide individuals with the most optimal remedial course for their ailments by promoting a wholesome way of life; while simultaneously furnishing accessible and cost-effective therapies to the populace [11] [8].

In PM, a constituent part of traditional medicine, the four elements, namely fire (characterized by hotness and dryness), earth (exhibiting coldness and dryness), water (displaying coldness and wetness), and air (manifesting hotness and wetness), assume a critical role in the identification and treatment of diseases. Through the lens of hotness, coldness, wetness, and dryness, each element possesses distinct attributes, wherein the amalgamation and interplay with other elements engender a novel notion known as temperament (referred to as *Mizaj* in Persian). Indeed, temperament serves as an essential cornerstone in PM, upon which the processes of diagnosis, treatment, and preventive measures are predicated. Any deviation from this state of equilibrium is denoted as dystemperament [12]. Recent investigations have also found a connection between dystemperament and certain diseases. For example, infertility has been linked to a cold temperament in the genital system [13].

BV is very common and frequently recurring. Relapse is common and current treatments are not fully effective. Despite PM's emphasis on organ-specific temperament and systemic body temperament balance, few studies have examined the condition from this perspective. This is a gap because there has not been any systematic research done on the possible connection between uterine temperament and body temperament in women with BV. Thus, the goal of this study was to investigate the relationship between uterine temperament and overall body temperament in BV patients in order to offer a PM-based viewpoint that could support complementary preventative and management strategies. Thus, in this cross-sectional study we intended to assess body temperament and uterus temperament in patients with BV.

Methods

Study design and setting

This cross-sectional study was conducted December 2021 to November 2022 on a total of 90 married females, aged between 18 and 50, who were suffering from BV. The participants were sourced from Afzalipour Hospital in Kerman, along with various healthcare facilities located in Kerman.

Participants and eligibility criteria

During the initial phase, an investigation was conducted on patients displaying symptoms of BV. The inclusion criteria were married women aged 18-50 years who fulfilled the requirements as confirmed by a gynecologist. BV was diagnosed based on the presence of three out of four criteria established by Amsel. These criteria included the observation of a homogeneous discharge from the vagina, identification of clue cells, a positive Wiff's test, a pH level exceeding 4.5, and absence of flagella parasites associated with trichomoniasis or candidiasis in the vaginal specimen. In the subsequent phase, a comprehensive examination was conducted on these individuals regarding their physical and uterine temperament by a Persian medicine expert. Subsequently, upon completion of the informed consent procedure, they were duly en-

rolled in the research endeavor.

Uterine temperament assessment

To evaluate the temperament of the uterus, a standardized questionnaire for determining uterus temperament was employed. This particular questionnaire comprises nine traits that are associated with either coldness or hotness. The survey encompassed olfactory perception of menstrual blood, quantity of pubic hair, temperature sensation of the thigh or buttocks, appearance of vaginal discharge, sexual desire or libido, texture of genital discharge, and perception of the cervix during sexual intercourse, in addition to three characteristics associated with wetness and dryness such as quantity of genital discharge, moistness of the cervix, and texture of the cervix. The spectrum of scores ranged from 1 to 7, wherein a score of 1 signifies the minimum degree of intensity and a score of 7 indicates the maximum level of intensity of the traits. The cumulative score attained in the initial segment of the questionnaire fluctuated between 9 and 63, whereby values proximal to 9 denoted a cold temperament and values approaching 63 denoted a warm temperament. Scores falling below 36 were indicative of coldness; while scores exceeding 36 were representative of warmth, with 36 established as the threshold for a balanced temperament. In the subsequent segment, scores varied from 3 to 21, wherein lower values signified dryness and higher values signified wetness; a score of 12 was deemed the threshold for equilibrium [14].

Body temperament assessment

Body temperament was assessed via a questionnaire containing 10 items, designed by Mojahedi et al. The initial eight components are utilized to determine the body's susceptibility to coldness and hotness. A score of ≤14 signifies a temperament towards coldness; while a score within the range of 15-18 indicates a balanced temperament, and a score exceeding 19 denotes a tendency towards hotness. The concluding two components are instrumental in determining the presence of dryness or wetness: a score of ≤3 indicates a wet temperament, a score of 4 signifies a state of equilibrium, and a score exceeding 5 suggests a temperament towards dryness. The reliability and validity of this methodology have already been affirmed [15].

Ethical Approval

The present study was approved by the Medical Research Ethics Committee of Kerman University of Medical Sciences (code: No. IR.KMU.REC.1400.547). The participants enrolled in the study after signing the informed consent form. They were assured of the confidentiality and anonymity of the data.

Sampling Method

Convenience and consecutive sampling were used in this investigation. Every married woman who met the inclusion criteria and visited the Obstetrics and Gynecology Clinic at Afzalipour Hospital in Kerman during the study period was evaluated in turn, and those who qualified were enrolled at the time of their visit. Practical limitations and the ease of patient access in the clinical setting led to the adoption of this strategy. Additionally, the risk of selection bias was reduced because participants were selected from regular clinic attendees, resulting in a sample that accurately represented the target population of women with bacterial vaginosis.

Sampel size

The standard formula for estimating a proportion was used to calculate the sample size:

$$n = \frac{z^2 p(1-p)}{d^2}$$

Z was set at 1.96 for a 95% confidence level. The estimated sample size was roughly 76 participants based on earlier research that reported the prevalence of "cold temperament of the uterus" at roughly p = 0.733, with an allowable margin of error (d = 0.10). The adjusted sample size rose to about 86 in order to account for a possible 10% loss from attrition or missing data. A final sample of ninety participants was included, taking into account the research center's recruitment capabilities and availability. We have now explained why this figure is reasonable and appropriate for the goals of the study in the manuscript's Methods section.

Statistical analysis

In this research, descriptive statistics were utilized to encapsulate demographic features and the distribution of temperament types. To examine the relationships between categorical variables (body temperament and uterine temperament, along with categorized demographic variables), the Chi-square test was selected as a suitable method for evaluating associations among nominal variables. The analyses were performed using SPSS software, version 24. The selection of this test was grounded in the categorical nature of the variables and the study's aim, specifically the comparison of group frequencies.

Results

Participants and descriptive data

In the examined sample, 4.4% had experienced no pregnancy, 23.3% one or two pregnancies, 44.4% between three and five pregnancies, and 27.8% more than six pregnancies. Also, 58.9% of the patients had experienced no abortion, 28.9 % one, 4.4% two, 3.3% three, and 4.4% had experienced four abortions. Further, 58.9% of patients were illiterate and only 2.2% of

the examined patients had academic education degree. Also, Table 1 reports the mean age of the patients with BV in the examined sample which was 31.73 years, their mean age of marriage was 18.83 years, the mean number of pregnancies was 4.45, and the mean number of children was 3.83.

Outcome data

Determining the body temperament in patients with BV

Investigation of the body temperament regarding hotness and coldness of the patients' body in figure 1 indicated that 18.9% had cold, 22.2% had balanced, and 58.9% had hot temperament. Also, examination of the body temperament regarding dryness and wetness in figure 1 showed that 47.6% had wet, 13.3% had balanced, and 40.0% had dry temperament. The results of examining the frequency of age in the body temperament line regarding hotness and coldness showed that among those with a hot temperament, 19 were in the age range 26-30 years, and 12 in above 40 years. Among those with a cold temperament, 11 were in the 31-35-year-old age group.

Determining the uterus temperament in patients with BV

The examination of the temperament of the uterus with respect to its hotness and coldness demonstrated that 83.3% of the patients had a cold temperament; whereas 16.7% displayed a hot temperament (Figure 2). Also, examination of the uterus temperament regarding dryness and wetness in figure 2 revealed that 64.4% had wet, 10.0% had balanced, and 25.6% had dry temperament.

Determining the relationship between demographic characteristics and body temperament

In order to choose an appropriate test, it is essential to identify the type of variables. Age, age of marriage, number of pregnancies, and number of abortions are variables of the ranked type. To determine their correlation with temperament, which is a nominal vari-

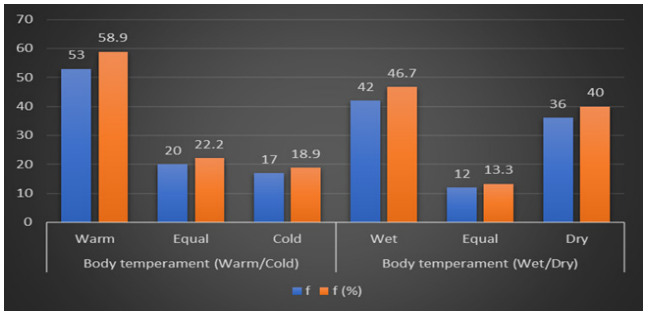

Figure 1. Determining the body temperament in patients with bacterial vaginosis

Table 1. Determining the frequency of demographic characteristics of patients with bacterial vaginosis

Demographic characteristics		Frequency (%)
Gravidity	0	4(4.4%)
	1-2	21(23.3%)
	3-5	40(44.4%)
	≤6	25(27.8%)
Parity	0	8(8.9%)
	1-2	24(26.7%)
	3-5	39(43.4%)
	≤6	19(21.1%)
Abortion	0	53((58.9%)
	1	26(28.9%)
	2	4(4.4%)
	3	3(3.3%)
	4	4(4.4%)
Education	Illiterate	53(58.9%)
	Elementary	22(24.4%)
	Secondary	11(12.2%)
	High school	2(2.2%)
	Academic	2(2.2%)
Age		31.73 ± 7.17
Marriage age		18.83 ± 3
Gravidity		4.45 ± 2.88
Parity		3.83 ± 3.63

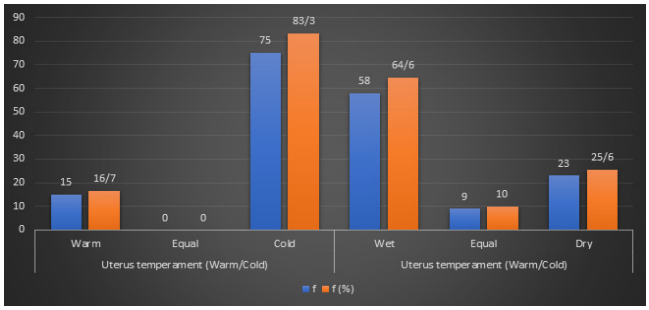

Figure 2. Determining the uterus temperament in patients with bacterial vaginosis

able, the Chi-Do test was employed. The findings of the Chi-squared test revealed a connection between the age of the patients and their body temperament in terms of hotness and coldness. Likewise, there was a correlation between body temperament and the number of abortions. Based on the data, in the present sample, less abortion is seen among those with a hot temperament. Also, among those who have not experienced any abortion, 30 had wet and 16 had dry temperament, and the individuals experiencing the maximum rate of abortion all had dry temperament. It should be noted that the Chi-square test reports only the χ^2 statistic and p value; confidence intervals and effect sizes are not directly provided by this test. The repeated appearance of p=0.047 in row 4 reflects the same statistical result and is consistent with the output format (Table 2).

Relationship between total body temperament and uterine temperament

The association between body temperament categories and uterine temperament categories was evaluated using Chi-square tests across two classification systems. For the first system (uterine temperament based on hotness/coldness), a significant relationship was observed with overall body temperament (hot, moderate, cold) (χ^2 test, p = 0.011). The reported Cramer's V value (0.011) corresponds to the significance level of the test.

For the second system (uterine temperament based on wetness/dryness), the association with body temperament (wet, moderate, dry) was also statistically significant, with the Chi-square tests yielding p values of 0.043 and 0.027. The corresponding Cramer's V values (0.043 and 0.027) again represent the significance levels. Collectively, these results indicate a statistically significant association between systemic body temperament and uterine temperament in both classification approaches, suggesting a consistent pattern between the two (Table 3).

Discussion

According to the principles of Persian medicine, dystemperament stands as a prominent etiology of ailments, and the identification of dystemperament serves as a fundamental prerequisite in the development of an efficacious therapeutic regimen.

Based on the results obtained, a significant majority of the patients exhibited a predominance of a hot and wet body temperament. This observation can be attributed to the patients being in their young ages, with an average age of 18.83 years. Notably, according to the principles of Persian medicine, the body tends to manifest higher levels of heat during the period of youthfulness [16].

The results obtained from this study showed that those with BV had 83.3% cold uterine temperament regarding coldness and hotness, and 64.4% had wet uterine temperament considering wetness and dryness. This was in line with the study by Adhami et al. in Tehran on these patients; specifically, 73.3% of patients had cold uterus temperament and 74.6% had wet uterus temperament [14]. According to Shirooyieh et al., which examined the pathophysiology of vaginal discharge in relation to Persian medicine and compared it to modern medicine, a theory has been proposed. This theory posits that the presence of humors with a cold uterus temperament plays a fundamental role in the development of BV [17]. However, the investigation conducted by Sultana et al. on the subject of uterus temperament and dystemperament in cases of abnormal vaginal discharge in India exhibited that the majority of patients exhibiting abnormal vaginal

Table 2. The relationship between the demographic characteristics and temperament of the body in patients with bacterial vaginosis

Demographic characteristics	Body temperament	Chi-square statistic (χ^2)	Degrees of freedom	p values
Age	(Warm/Cold)	18.536	8	0.018
	(Wet/Dry)	10.699	8	0.219
Marriage age	(Warm/Cold)	1.422	4	0.840
	(Wet/Dry)	8.725	4	0.068
Gravidity	(Warm/Cold)	11.82	6	0.086
	(Wet/Dry)	7.071	6	0.314
Abortion	(Warm/Cold)	0.047	8	0.047
	(Wet/Dry)	0.040	8	0.040

Table 3. Relationship between total body temperament and uterine temperament

		Uterine temperament 1		Sig	Cramer's V	Uterine temperament 2			Sig	Cramer's V
		cold	hot			wet	moderate	dry		
Body temperament 1	cold	16	1	0.011	0.011	13	4	0	0.043	0.043
	moderate	20	0			13	1	6		
	hot	39	14			32	4	17		
Body temperament 2	wet	31	11	0.015		31	0	11	0.027	0.027
	moderate	9	3			8	1	3		
	dry	35	1			19	8	9		

discharges had wet and warm dystemperament [18]. This observation aligns with the findings of our current study in terms of wetness, but diverges in respect to coldness and warmth. This discrepancy may be attributed to the traditional medical principle asserting that individuals inhabiting different climates show distinct bodily temperaments, The discrepancy with the findings of Sultana et al., who reported warm-wet uterine temperament, may be explained by differences in climate, ethnicity, or study populations. This highlights the need for more critical cross-regional comparison; thus, manifesting distinct temperaments within their body [16]. This hypothesis may provide a rationale for instances of treatment resistance, further investigation, conducted with a larger sample size across diverse regions of the globe, is warranted to substantiate these theories. Subsequently, in light of variances in temperament, diverse herbs ought to be employed, and their impact on treatment-resistant cases should be scrutinized.

According to the principles of Persian medicine, different illnesses are believed to be correlated with the cold temperament of the body or its organs [9]. Thus, the presence of a cold uterine dystemperament may be associated with uterine conditions; however, causation cannot be inferred from this study. Kaviani et al. conducted a study exploring the correlation between temperament and dysmenorrhea. Their findings revealed that individuals with a cold temperament exhibited heightened levels of pain [19]. Also, in the study by Sultana et al., evaluation of general body temperament and uterine dystemperament in amenorrhea indicated that cold and wet general temperament as well as uterine temperament is more common in amenorrhea and obesity (18). The aforementioned studies demonstrate that in the condition of dysmenorrhea and amenorrhea, dystemperament manifests as cold and wet, which aligns with our findings. Our own research found that patients with BV also exhibited a cold and wet temperament of the uterus.

Based on the study results examining the relationship between body temperament and demographic characteristics, it was found that those with dry and cold body temperament had the highest rate of abortion, and individuals with wet and hot temperament showed the minimum rate of abortion. In exploring the paper by Tansaz et al. regarding evaluation of uterus temperament of Iranian infertile women using a quantitative tool for diagnosing uterus temperament for whom body temperament was also evaluated, it was found that the body temperament was cold in infertile women [13]. According to traditional medicine theories, cold and dry dystemperament results in increased abortion [20]. Nevertheless, to prove these theories, further research should be conducted with a larger sample size. Research in this issue is important since treatment of such dystemperaments before pregnancy may help patients and contribute to lowering their rate of abortion.

One notable confounder in this study is the low educational attainment among participants, with 58.9% being illiterate. This factor could have impacted their comprehension of the questionnaire items and the reliability of their responses, despite the questions being administered directly by the researcher.

The study's primary limitation revolves around its small sample size and the restriction of participants to a specific geographic area- the southeastern region of Iran (Kerman)- which reduces the broader applicability of the findings. Furthermore, possible selection bias may have arisen due to recruitment from a single research center. The reliance on self-reported evaluations of temperament adds another layer of potential bias, potentially affecting the accuracy of the data collected. Additionally, these outcomes are most relevant to Iranian women and may not be widely generalizable to populations outside Iran. Future research should aim to overcome these limitations by utilizing larger, more diverse cohorts encompassing various geographical regions. Moreover, developing precise quantitative tools to assess uterine temperament would enhance the reliability and scope of future studies.

Conclusion

According to our study, most patients exhibited a cold and wet uterine dystemperament. In Persian medicine, temperament serves as a key diagnostic tool, and our results point to a potential link between uterine dystemperament and an increased risk of bacterial vaginosis. Future research should prioritize moving beyond cross-sectional studies by incorporating longitudinal designs to better understand these pathways. Additionally, interventional studies are needed to explore whether addressing uterine dystemperament could decrease susceptibility to BV. Broadening the scope of research to include larger and more diverse populations, including individuals from non-Iranian communities, would improve the generalizability of these findings. Combining diagnostic and therapeutic practices from Persian medicine with modern medical approaches could lead to more effective treatments, help combat drug resistance, and reduce the overall burden of chronic diseases.

Conflicts of Interests

The authors declare no conflicts of interest.

Acknowledgements

None.

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