

# Analysis of the Effectiveness of Microbiological Testing Methods in Gynecological Inflammatory Infections

Zhen-Chang Liu\*

Jiangxi Province Huichang County Maternal and Child Health Care Hospital, Jiangxi, Ganzhou, 342600, China

\*Correspondence to: Zhen-Chang Liu, Jiangxi Province Huichang County Maternal and Child Health Care Hospital, Jiangxi, Ganzhou, 342600, China, E-mail: [536591561@qq.com](mailto:536591561@qq.com)

**Abstract: Objective:** To analyze the microbiological testing methods and their effectiveness in gynecological inflammatory infections. **Methods:** A study was conducted on 100 patients with gynecological inflammatory infections from April 2023 to April 2024 in our hospital. Patients were divided into groups based on the testing method used: amine test (Group A), culture method (Group B), agglutination test (Group C), and microscopy (Group D). The main symptoms of the 100 patients were analyzed, and the test results were compared. **Results:** Among the 100 patients, 96 experienced vaginal odor (96.00%), 94 had vulvar itching (94.00%), 92 had abnormal vaginal discharge (92.00%), 88 had frequent urination (88.00%), and 78 had urgent urination (78.00%). The positive detection rates in Groups A, B, C, and D showed an increasing trend but without significant difference ( $P > 0.05$ ). **Conclusion:** All four testing methods are effective for detecting gynecological inflammatory infections. The appropriate method can be selected based on the actual situation.

**Keywords:** gynecological inflammatory infections; microbiological testing; agglutination test; microscopy

Gynecological inflammatory infections have a high incidence and come in various types, with common conditions including ovarian cysts, endometritis, and pelvic inflammatory disease. Epidemiological studies indicate that gynecological infections are prevalent, with an infection rate of approximately 30.00%-50.00%. In recent years, the incidence has been increasing, significantly impacting women's health and reducing their quality of life. The gynecological medical community is increasingly focusing on this disease, recommending that women receive scientific and comprehensive guidance for early detection, prevention, and treatment to eliminate inflammatory infections. Microbiological testing can

detect inflammatory infections, effectively identify pathogenic microorganisms, and improve diagnostic accuracy. There are numerous microbiological testing methods, each with different principles, and their specific roles are currently unclear. This study focuses on patients with gynecological inflammatory infections to analyze the effectiveness of different microbiological testing methods.

## 1. Data and Methods

### 1.1 General Information

A study was conducted on 100 cases of gynecological inflammatory infection patients in our hospital from April 2023 to April 2024. The age ranged from 20 to 62



© The Author(s) 2024. **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, sharing, adaptation, distribution and reproduction in any medium or format, for any purpose, even commercially, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

years old, with an average age of (39.25±4.26) years. Among them, 22 cases were diagnosed with uterine adnexal infections, 32 cases with pelvic infections, and 46 cases with vaginal infections.

Inclusion criteria:History of sexual activity;Confirmed diagnosis of gynecological inflammatory infection;Informed consent for participation in the study.

Exclusion criteria:Significant organ dysfunction; Presence of other physiological diseases;No antibiotic use within the past 2 weeks.

**1.2 Methods**

Preparation before testing: Patients were positioned supine, sterile cotton was used to wipe the vaginal sidewalls, ensuring approximately 3.00% coverage of secretions, adhering to sterile principles. A portion of the secretions was collected, placed in soft agar test tubes, stored at -40°C, with sampling time not exceeding 24 hours, and promptly sent for testing.

**1.2.1 Group A**

Amine test: Observation of patient symptom presentation, interpretation from a diagnostic perspective, examination of vaginal tissue structure. If bacterial infection is detected, due to the presence of amine substances in vaginal discharge, characterized by a distinct fishy odor perceptible through smell, the presence of bacterial infection is suggested under this condition. Potassium hydroxide examination is recommended to determine whether vaginal tissue is infected with bacteria.

**1.2.2 Group B**

Culture method: Standardized samples were collected and placed in Sabouraud agar culture medium. The samples were cultured at 35°C for a total of 7 days. If fungal growth was not detected, it indicated the absence of fungal infection.

**1.2.3 Group C**

Agglutination test: Secretion samples were placed at the bottom of test tubes, an appropriate amount of soft agar substance was added, and the tubes were stored in a dedicated refrigerator at -40°C. Temperature control was strictly maintained to ensure that the samples were stored properly and inoculated within 24 hours. Macroscopic observation was conducted, and the absence of significant purple particles indicated the absence of fungal infection.

**1.2.4 Group D**

Microscopic examination: Vaginal secretions were collected and used only as examination slides. A 10% potassium hydroxide solution (2 drops) was applied to the slides. Using a microscope, careful examination was performed. The presence of spore structures or fungal hyphae structures indicated a positive result for inflammatory infection.

**1.3 Observation Items and Indicators**

Analysis of Symptoms in 100 Patients:Observation of the number of cases with symptoms including vaginal odor, vulvar itching, abnormal vaginal discharge, frequent urination, and urgent urination. Calculate the proportions.Evaluation of the Results of the Four Testing Methods:Observation of the number of positive and negative cases detected by the four methods. Calculate the positive detection rate.

**1.4 Statistical Methods**

Data were analyzed using SPSS 27.0. Percentage (%) indicates count data. Chi-square tests were conducted, with significance set at  $P < 0.05$ , indicating statistically significant differences.

**2. Results**

**2.1 Analysis of Symptoms in 100 Patients**

Among the 100 patients:96 patients experienced vaginal odor, accounting for 96.00%.

94 patients had vulvar itching, accounting for 94.00%.92 patients had abnormal vaginal discharge, accounting for 92.00%. 88 patients had frequent urination, accounting for 88.00%.78 patients had urgent urination, accounting for 78.00%.

Please refer to **Table 1** for details.

**Table 1:** Analysis of Symptoms in 100 Patients [n(%)]

Symptom	Number of Cases	Percentage
Vaginal odor	96	96.00
Vulvar itching	94	94.00
Abnormal vaginal discharge	92	92.00
Frequent urination	88	88.00
Urgent urination	78	78.00

**2.2 Comparison of Results from Four Testing Methods**

The positive detection rates in Groups A, B, C, and D showed an increasing trend, but the differences were not statistically significant ( $P > 0.05$ ). Please refer to **Table 2** for details.

**Table 2:** Comparison of Results from Four Testing Methods [ $n(\%)$ ]

Group	Number of Cases	Number of Positive Cases	Number of Negative Cases	Positive Detection Rate
A	100	72	28	72.00
B	100	78	22	78.00 <sup>a</sup>
C	100	80	20	80.00 <sup>ab</sup>
D	100	86	14	86.00 <sup>abc</sup>

Note: Compared to Group A: <sup>a</sup> $P > 0.05$ , Compared to Group B: <sup>b</sup> $P > 0.05$ , Compared to Group C: <sup>c</sup> $P > 0.05$

### 3. Discussion

Epidemiological studies have shown that over 61.00% of adult females may experience infections in their reproductive tract when their reproductive tissues are examined for microorganisms. The complex and unique anatomical structure of the human body, combined with external and internal factors, predisposes it to the growth of numerous pathogenic microorganisms, leading to dysbiosis and resulting symptoms such as urgency urination and genital itching. Fungal infections, particularly candidiasis, are the most common, often parasitizing the intestinal mucosa, oral cavity, and vaginal tract, with vaginal candidiasis being the most prevalent. *Candida albicans* can cause vaginal candidiasis, leading to localized infections such as superficial skin and mucosal infections or systemic infections. Classifying gynecological inflammations based on the affected site includes lower reproductive tract inflammations like cervicitis and vulvitis, as well as upper reproductive tract inflammations such as endometritis and salpingitis. Each type of inflammation presents different symptoms. For example, pelvic inflammatory disease (PID) commonly manifests as lower abdominal distension, lumbar pain, and soreness, while patients with adnexitis experience bilateral lower abdominal distension, accompanied by chills and fever, and lumbar sacral pain. Cervicitis can cause a sensation of prolapse in the cervix or lower abdomen, bleeding during sexual intercourse, increased viscous discharge, and vulvar swelling and itching. Vaginitis is characterized by abnormal vaginal discharge, odor, and redness and itching of the external genitalia. Endometritis presents with irregular bleeding, mood swings, irritability, and menstrual irregularities. This disease has a high incidence and primarily affects adult females. It is curable, typically with antimicrobial therapy. Early treatment yields better results.

Once the disease is diagnosed, timely treatment can effectively control the disease, and it can also be used

in primary hospitals. However, the operator should be experienced, have a high sense of responsibility, prevent false negatives, reduce false positives, and ensure high accuracy. Research results show that out of 100 patients, 96 had external genital odor, accounting for 96.00%, 94 had external genital itching, accounting for 94.00%, 92 had abnormal vaginal discharge, accounting for 92.00%, 88 had urinary frequency, accounting for 88.00%, and 78 had urinary urgency, accounting for 78.00%. This indicates that common symptoms of gynecological inflammation infection include external genital odor, itching, and abnormal vaginal discharge. The positive detection rates of Groups A, B, C, and D showed an increasing trend but without significant differences ( $P > 0.05$ ), indicating that the accuracy of the amine test method was the lowest, while microscopy was the highest. However, there were no significant differences among the four methods. When conducting tests, appropriate methods should be selected based on the patient's condition and hospital situation. This suggests that all four techniques can effectively detect gynecological inflammation infections, facilitating the analysis of the condition and the formulation of treatment plans.

In summary, all four methods for testing gynecological inflammation infections are effective and can be selected based on actual circumstances.

### References

- [1] Meng, L., Han, D., & Wu, F. (2024). Analysis of Microbiological Examination Methods in Gynecological Inflammatory Infections. *Industrial Microorganisms*, 54(2), 60-62.
- [2] Huang, J., Huang, J., & Han, P. (2023). Study on the Effect of Different Microbiological Examination Methods in Gynecological Inflammatory Infections. *Systems Medicine*, 8(23), 161-164.
- [3] Liu, Y. (2023). Analysis of the Application Value

- of Different Microbiological Examination Methods in Gynecological Inflammatory Infections Testing. *Smart Health*, 9(32), 45-48.
- [4] Gao, L. (2023). Observation of Several Microbiological Examination Methods in Gynecological Inflammatory Infections. *Industrial Microorganisms*, 53(5), 125-127.
- [5] Wang, R. (2021). Effect and Clinical Analysis of Microbiological Examination Methods in Gynecological Inflammatory Infections. *Health Care Medicine Research and Practice*, 18(1), 106-108.
- [6] Li, H., & Huang, Y. (2022). Discussion on the Use of Different Microbiological Examination Methods in Gynecological Inflammatory Infections. *China Rural and Urban Enterprise Health*, 37(3), 150-152.
- [7] Huang, S. (2021). Evaluation of Microbiological Examination Methods for Gynecological Inflammatory Infections. *Medical Nutrition Therapy and Health*, 19(12), 147-148.
- [8] Yin, D., & Wang, R. (2021). Effect and Clinical Observation of Microbiological Examination Methods in Gynecological Inflammatory Infections. *Smart Health*, 7(27), 10-12.