

Title: Advancing vaginal infection diagnosis: Molecular versus conventional methods for detecting *T. vaginalis* and *C. albicans*

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Abstract:

Trichomonas vaginalis (*T. vaginalis*) is a motile, flagellated protozoan that exclusively infects humans. It is a significant etiological agent of vaginitis and has been associated with adverse reproductive outcomes such as preterm birth and infertility. *Candida albicans* (*C. albicans*) accounts for approximately 85–90 % of fungal vaginitis cases. This study aimed to determine the prevalence of trichomonal and candidal vaginitis among married women attending health centers in Khorramabad, using both conventional laboratory techniques and molecular diagnostics.

Methods

In this descriptive-analytical study, vaginal specimens were collected from 304 married women attending health centers in Khorramabad during 2024. Samples were analyzed using conventional laboratory methods, including direct smear, Giemsa staining, culture on Sabouraud Dextrose Agar (SDA), germ tube test, Corn Meal agar culture, and incubation at 45 °C, as well as molecular techniques (PCR and sequencing). Data were statistically analyzed using SPSS version 27.

Results

T. vaginalis was identified in 9 cases (3 %) via PCR and in 2 cases (0.7 %) via direct smear. The kappa coefficient for agreement between direct smear and PCR was 0.36 ($p < 0.001$), indicating fair concordance. For *C. albicans*, PCR detected 20 positive cases (6.6 %), while conventional methods yielded the following results: direct smear 56 cases (18.4 %), SDA culture 65 cases (21.4 %), germ tube test 63 cases (20 %), Corn Meal agar culture 58 cases (19.1 %), and incubation at 45 °C 12 cases (3.9 %).

Conclusion

PCR demonstrated superior sensitivity for detecting *T. vaginalis*, whereas SDA culture exhibited the highest sensitivity for *C. albicans*. The low prevalence of trichomoniasis (3 %) contrasted with the relatively high prevalence of candidiasis (6.6–21.4 %), underscoring the need for targeted educational and preventive health programs