ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor (RJIF): 8.4
IJAR 2024; 10(5): 251-253
www.allresearchjournal.com
Received: 14-02-2024
Accepted: 16-03-2024

Dr. Radha D Datkar
Junior Resident 3, Department of Microbiology, GMC Nagpur, Maharashtra, India

Dr. Manjushri Waiker
Professor and Head, Department of Obstetrics and Gynecology, GMC Nagpur, Maharashtra, India

Sonali S Gosavi
Technician, RSTRRL, Department of Microbiology, GMC Nagpur, Maharashtra, India

Manisha K Sharma
Research Officer, RSTRRL, Department of Microbiology, GMC Nagpur, Maharashtra, India

Kalindi S Deogade
Technician, RSTRRL, Department of Microbiology, GMC Nagpur, Maharashtra, India

Dr. Vandana A Agarwal
Professor, Department of Microbiology, GMC Nagpur, Maharashtra, India

Corresponding Author:
Dr. Radha D Datkar
Junior Resident 3, Department of Microbiology, GMC Nagpur, Maharashtra, India

Wet Mount Vs Culture: Cost Effectiveness for diagnosis of Trichomonal Vaginitis

Dr. Radha D Datkar, Dr. Manjushri Waiker, Sonali S Gosavi, Manisha K Sharma, Kalindi S Deogade and Dr. Vandana A Agarwal

Abstract
Background: In recent years, *Trichomonas vaginalis* has emerged as the most common parasitic cause of sexually transmitted infections and limited data is available on the effective screening technique for diagnosis of *Trichomonas vaginalis* in resource limited settings. Aim of the present study was to assess the sensitivity and specificity of wet-mount, taking culture as gold standard and to compare the cost-effectiveness of wet-mount and culture for the diagnosis of *T. vaginitis.*
Materials and Methods: The study was conducted from April 2020 to September 2023 at Government Medical College and Hospital, Nagpur. It was a prospective cross-sectional wherein 9397 symptomatic women complaining of increased vaginal discharge with or without itching attending Gynecology OPD were tested. Two vaginal swabs were collected, the first swab was used for wet-mount preparation and the second swab was used for culture in Kupferberg medium. The cost of wet-mount and culture were calculated for examining 10,000 vaginal swabs by each method, taking into consideration use of sterile normal saline, slides and coverslips for wet mount and use of stuart's medium, Kupferberg medium and supplement for culture. The cost incurred upon manpower and infrastructure was not included.
Results: Out of 9397 samples, 73 were positive by wet-mount and additional 3 were positive by culture for *T. vaginalis.* Overall, *T. vaginalis accounted* for 0.80% reproductive tract infections. Cost of wet-mount and culture calculated for 10,000 samples was 5000 and 47,700 respectively.
Conclusion: Sensitivity and specificity of wet-mount was 96.20% and 100% respectively and the cost was 8.5 times lower as compared to culture. We found wet-mount a simple and cost-effective method suitable for diagnosis of *T. vaginitis* in resource limited settings.

Keywords: *Trichomonas vaginalis,* Kupferberg medium, Wet-mount

Introduction
Trichomonas vaginalis, a sexually transmitted protozoan, affects approximately 400 million people worldwide, with new infection reported at about 156 million annually [1]. In female's clinical manifestations vary from asymptomatic presentation to vaginitis with copious discharge. Association of trichomonas in women can lead to serious sequelae such as preterm labour, premature rupture of membranes and low birth weight. It has also been associated with significantly higher risk of HIV transmission [2, 3]. Diagnosis of *Trichomonas vaginalis* cannot be made only on the basis of clinical presentations as the clinical symptoms may be synonymous with other STDs. Hence laboratory diagnosis is necessary for early and accurate diagnosis [4, 5]. However, data on effective screening techniques for the diagnosis of Trichomonal vaginitis in resource limited settings is scanty. The aim of this study was to assess the sensitivity and specificity of wet-mount, taking culture as gold standard and to compare the cost-effectiveness of wet-mount and culture for the diagnosis of *T. vaginitis.*

Materials and Methods
The study was conducted from April 2020 to September 2023 at Government Medical College and Hospital, Nagpur. It was a prospective cross-sectional wherein 9397 symptomatic women complaining of increased vaginal discharge with or without itching attending Gynecology OPD were tested. Two vaginal swabs were collected, the first swab was used for wet-mount preparation and the second swab was used for culture in Kupferberg medium. The cost of wet-mount and culture were calculated for examining 10,000 vaginal swabs by each method, taking into consideration use of sterile normal saline, slides and

coverslips for wet mount and use of stuart's medium, Kupferberg medium and supplement for culture. The cost incurred upon manpower and infrastructure was not included.

Results

Out of 9397 women screened, 76 were positive for *T. vaginalis* by gold standard culture and 9321 were negative. None of the sample gave false positive results by microscopy alone. Of these 76 culture positive cases, 73 were positive by both microscopy and culture and three cases which were missed by microscopy were picked by culture. Sensitivity and specificity of wet-mount were 96.20% and 100% respectively as shown in Table 1.

Cost effectiveness was calculated for examining 10,000 vaginal swabs by each method, taking into consideration use of sterile normal saline, slides and coverslips for wet mount and use of stuart's medium, Kupferberg medium and supplement for culture. The cost incurred upon manpower and infrastructure was not included. As shown in table 2 cost of wet-mount was 8.5 times lower as compared to culture.

Discussion

In the present study prevalence of *T. vaginalis* is 0.81%. Researchers have reported a prevalence of 1.3-16.5% of *T. vaginalis* in STI's, worldwide [6, 7]. In India low prevalence has been reported from Andaman and Nicobar (0.9%) and Northern India (0.57%) most likely due to syndromic management of STI's [8, 9]. Even though *T. vaginalis* infection has been associated with adverse outcomes of pregnancy and increased risk of human immunodeficiency virus acquisition, little emphasis has been laid on importance of decreasing its rates. However, using a sensitive screening test can help in increasing diagnosis and treatment of T. vaginitis, thereby decreasing its prevalence.

Gold standard for diagnosis of trichomoniasis is still culture, however, culture requires expensive culture media, media preparation is cumbersome, cannot detect nonviable organism and may have to wait 3-7 days [10]. In the present study the sensitivity and specificity of wet mount was 96.20% and 100% respectively compared to culture and also cost effectiveness of wet-mount was 8.5 times lower than that of culture. However, the sensitivity of wet-mount highly depends on expertise of microscopist, prompt transport and laboratory processing of the sample before organism loses its motility [11, 12].

Other methods like Fluorescent microscopy, nucleic acid amplification and molecular tests are highly sensitive, however, they are costly, not always available at health service and often require laboratory infrastructure thereby limited to higher centers' only [10].

Table 1: Diagnosis of T. vaginitis by microscopy and culture

Method	FY: April to march			
	2020-21	2021-22	2022-23*	Total
Only microscopy +	0	0	0	0
Only culture +	1	0	2	3
Both microscopy & culture +	19	13	41	73
Both microscopy & culture -	3683	2666	2972	9321
Total	3703	2679	3015	9397

- * Upto September 2023 Prevalence = 0.81%
- Sensitivity – 96.20% and Specificity – 100%

Table 2: Cost effectiveness of wet-mount vs culture for diagnosis of T. vaginitis

Material	Cost incurred in examining 10,000 vaginal swabs	
	Wet-mount	Culture
Slide	Rs 3900	-
Cover slip	Rs 1100	-
Kupferberg medium	-	Rs 14,600
Supplement	-	Rs 26,000
Stuart's medium	-	Rs 2065
Total cost	Rs 5000	Rs 42,665
Cost ratio	1	8.5

Conclusion

Wet-mount microscopy for detection of *T. vaginalis* is a rapid, inexpensive screening technique, with high sensitivity and specificity of 96.20% and 100% respectively. Culture has higher sensitivity compared to wet-mount, but it is 8.5 times costly than wet-mount and not easily available in resource limited settings.

References

1. World Health Organization. Report on global sexually transmitted infection surveillance 2018. Geneva: World Health Organization; c2018. p. 63.
2. Wolner-Hanssen P, Krieger JN, Stevens CE, Kiviat NB, Koutsky L, Critchlow C, *et al*. Clinical manifestations of vaginal trichomoniasis. JAMA 1989;261:571-6.
3. Royce RA, Seva A, Cates W, Cohen MS. Sexual transmission of HIV. N Engl J Med. 1997;336:1072-8.
4. Fouts AC, Kraus SJ. *Trichomonas vaginalis*: Reevalaution of its clinical presentation and laboratory diagnosis. J Infect Dis. 1980;141:137-43.
5. McLellan R, Spence MR, Brockman M, Raffel L, Smith JL. The clinical diagnosis of trichomoniasis. Obstet Gynecol. 1982;60:30-4.
6. Anh PK, Khauh NT, Ha DT, Chien do T, Thue PT, Luong PH, *et al*. Prevalence of lower genital tract infection among women attending maternal and child health and family planning clinics in Hanoi, Vietnam. Southeast Asian J Trop Med Public Health. 2003;34:367-73.

7. Garcia PJ, Chavez S, Feringa B, Chiappe M, Li W, Jansen KW, *et al*. Reproductive tract infections in rural women from the highlands, jungle and coastal regions of Peru. Bull World Health Organ. 2004;82:483-92.
8. Parvez R, Vins A, Radhakrishnan V, Beniwal N, Biswas L, Thankachan N, *et al*. *Trichomonas vaginalis* infection among married women of Andaman and Nicobar Islands. Infect Dis (Lond). 2023;55(12):874-879. Doi:10.1080/23744235.2023.2236700. Epub 2023 Aug 2. PMID: 37531291.
9. Chaudhary N, Kalyan R, Singh M, Agarwal J, Qureshi S. Prevalence of reproductive tract infections in women attending a tertiary care center in Northern India with special focus on associated risk factors. Indian J Sex Transm Dis AIDS. 2019;40(2):113-119. doi: 10.4103/ijstd.IJSTD_17_16. PMID: 31922100; PMCID: PMC6896375.
10. Nathan B, Appiah J, Saunders P, Heron D, Nichols T, Brum R, *et al*. Microscopy outperformed in a comparison of five methods for detecting *Trichomonas vaginalis* in symptomatic women. Int J STD AIDS. 2015;26(4):251-6
11. Draper D, Parker R, Patterson E, Jones W, Beulz M, French J, *et al*. Detection of *Trichomonas vaginalis* in pregnant women with the In Pouch TV culture system. J Clin Microbiol. 1993;31:1016-8.
12. Barenfanger J, Drake C, Hanson C. Timing of inoculation of the pouch makes no difference in increased detection of *Trichomonas vaginalis* by the In Pouch TV method. J Clin Microbiol. 2002;40:1387-9.