

Original Research Article

Diagnostic Efficacy of Wood's Lamp Examination Compared with Koh Wet Mount for Diagnosis of Pityriasis Versicolor Cases

Remya V. S¹, Arun B²

¹Assistant Professor, Department of Microbiology, Pariyaram Medical College, Kannur, Kerala, India.

²Assistant Professor, School of Health Sciences, Kannur University, Kannur, Kerala

Corresponding Author: Arun B

ABSTRACT

Background: Pityriasis versicolor (PV) is a chronic superficial fungal infection prevalent in tropical and subtropical countries. KOH wet mount and Wood's lamp examination are useful in diagnosing pityriasis versicolor. Aim of the study is to compare the effectiveness of Wood's lamp examination in clinically suspected pityriasis versicolor cases compared with KOH wet mount.

Objective: To demonstrate the diagnostic efficacy of Wood's lamp examination in comparison with KOH wet mount for diagnosis of PV. **Methods:** A total number of 450 different body sites of 422 pityriasis versicolor cases with respect to colour of lesions were studied. Wood's lamp examination was done in a dark room using Wood's lamp and 10% KOH wet mount was performed with Skin scrapings. Statistical analysis was done.

Result: Out of 450 lesions sampled, Wood's lamp was positive with 388 (86.2%). KOH wet mount gave 402 (89.3%) positive results. The sensitivity and specificity of Wood's lamp examination when compared with KOH wet mount was 96.52%, 100% respectively.

Conclusion: The diagnostic efficacy of Wood's lamp is comparable to KOH wet mount.

Key Words: - Pityriasis versicolor, *Malassezia*, KOH wet mount, Wood's lamp

INTRODUCTION

Pityriasis versicolor (PV) is a common cutaneous fungal infection prevalent in tropical and subtropical countries etiologically associated with lipophilic fungi of the genus *Malassezia*.^[1-3] The diagnosis of PV is usually done by clinical examination. The disease should always be confirmed by direct examination with 10% potassium hydroxide (KOH) wet mount. Wood's lamp is an important diagnostic tool in dermatology that can demonstrate fluorescence in PV. It is a small, simple, durable, non-invasive, inexpensive, safe and very easy to use device, chiefly used for the diagnosis of infective and pigmentary dermatoses by dermatologists.^[4-6]

The Wood's Lamp is based on the principle of fluorescence and was described in 1903 by a Baltimore physicist Robert W. Wood and was first used in dermatology by Margarot and Deveze in 1925 for the detection of tinea capitis.^[4-8] In order to observe fluorescence, the patient should undergo irradiation with Wood's lamp in a dark environment, i.e. in the absence of visible light.^[5] The lamp emits an invisible long wave ultra violet radiation at the wave length of 340-450 nm (maximum at 365 nm). Light is absorbed and radiation of a longer wave length, usually visible light, emitted to observe the fluorescence.^[4] This device can also be used for the diagnosis of bacterial and fungal infections, pigmentary changes and porphyria and each dermatosis

may show specific colour on fluorescence. [4,5]

Yellow-orange to green-yellow fluorescence observed by PV lesions under Wood's light is due to the presence of pityrialactone. [1] There are also other dermatoses which can use Wood's lamp for diagnosis. [5] Tinea capitis caused by *M.canis* and *T. schoenleinii* shows blue-green and light blue fluorescence respectively. Coproporphyrin III imparts coral red fluorescence in erythrasma caused by *Corynebacterium minutissimum*. Orange-red fluorescence in acne caused by *P.acne* is due to Coproporphyrin. [4-6]

Wood's lamp can detect early *Pseudomonas* infection of burn wounds due to the production of a pigment 'fluorescein' which shows green fluorescence. Depigmented patches of Vitiligo demonstrate bright blue fluorescence. In epidermal melasma lesions are well demarcated, whereas dermal melasma demonstrates less colour contrast. Examination of progressive macular hypomelanosis with Wood's lamp shows bright blue and coral red follicles. In urine of patients bearing some porphyrias shows coral red fluorescence. [4-6]

MATERIALS AND METHODS

This study was conducted at a tertiary care hospital in North Kerala. The study group comprises of 422 clinically suspected cases of PV attending Dermatology Outpatient Department over a period of 1 year. A total number of 450 different body sites of 422 PV cases with respect to colour of the lesions were studied. After taking informed consent Wood's lamp examination and KOH wet mount was performed.

Wood's lamp examination: All suspected cases seen by the dermatologists were studied with examination in a dark room which was situated near the OPD. The lamp was switched on and allowed to warm up for approximately one minute to attain optimum intensity. The light was allowed to fall on the lesion and adjacent skin by

keeping it 4–5 inches away from the body. The affected lesions were observed for the presence or absence of fluorescence and the results were recorded. [4]

Direct microscopy: Microscopic examination of the scales was performed after treatment with 10% KOH for detection of fungal elements. (spaghetti and meatballs appearance). The scales were collected by scraping the PV lesions with sterile No: 15 scalpel blades without disrupting healthy looking areas. The scrapings were placed on a clean glass slide with 1-2 drops of 10% KOH. A cover slip was placed over it and the preparation was examined under the 40X objective of microscope. [9]

RESULTS

This study compared two different methods for diagnosis of PV. Since KOH wet mount is the commonly used existing method for identifying PV, KOH wet mount has been considered as the gold standard and Wood's lamp examination is compared to this.

Out of 450 lesions studied, Wood's lamp was positive with 388 (86.2%) KOH wet mount gave 402 (89.3%) positive results. Negative result was got in 62(13.79%) with Wood's lamp and 48 (10.67%) with KOH wet mount. (Table-1)

(Table-1) Diagnostic efficacy of Wood's lamp examination compared with KOH wet mount in PV suspected cases.

Pityriasis Versicolor Cases	KOH wet mount		Total	
	Positive	Negative		
	Positive	388	0	388
	Negative	14	48	62
Total		402	48	450

A total of 402 PV cases were detected by KOH wet mount (plate-1), out of which 388 cases were detected by Wood's lamp (plate-2). Forty eight cases were found to be negative using KOH wet mount; all these cases were also found to be negative using Wood's lamp. So the sensitivity of Wood's lamp as compared to KOH wet mount is 96.52% and the specificity is 100%.

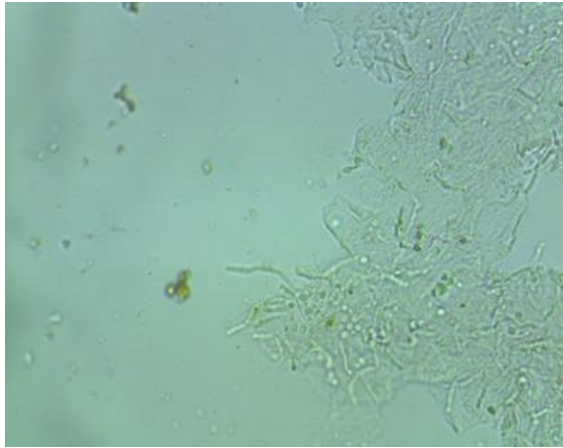


Plate-1 Direct microscopy using KOH wet mount showing. Direct microscopy using KOH wet mount showing yeast cells and pseudo hyphae ("spaghetti and meatball" appearance) of *Malassezia* -in PV

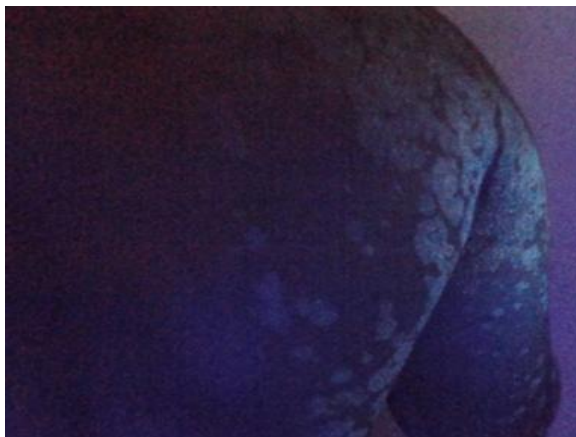


Plate-2. Wood's lamp examination showing positive fluorescent lesions in pityriasis versicolor

DISCUSSION

Pityriasis versicolor is a cutaneous fungal infection characterized by changes in skin pigment due to colonization of stratum corneum by a lipophilic fungus of genus *Malassezia*. [1-3] The disease can be easily diagnosed, but should always be confirmed by direct microscopy using 10% potassium hydroxide to demonstrate pseudohyphae and blastoconidia in typical "spaghetti and meatballs" pattern. [10]

Wood's lamp is a valuable device in dermatology useful in many dermatological disorders. Each dermatosis may show specific colour on fluorescence. [4-6] In PV the fungus produces, pityrialactone, a fluorescent bis indole compound that produces yellow orange to green yellow fluorescence on exposure to Wood's light. [1,4] Pityrialactone shows blue fluorescence

in a lipophilic environment and yellow fluorescence in watery milieu. The multicolor fluorescence of PV lesions fluctuating from yellow-orange to green-yellow described in the various literatures might be explained by this depending on whether the substance was dissolved in sweat or epidermal lipids. [1,11]

This study compared Wood's lamp examination with KOH wet mount in patients with PV. The present study showed Wood's lamp and KOH positivity in 86.2% and 89.3% respectively of the PV lesions studied. The sensitivity of Wood's lamp as compared to KOH wet mount is 96.52% and the specificity is 100%. No studies are available regarding the diagnostic efficacy of Wood's lamp compared to KOH.

The positive Wood's lamp examination in this study shown by 86.22% of lesions studied correlate well with other studies done in various parts of India and Indonesia. [12-14]

Whereas a higher percentage was obtained in studies conducted in West Bengal [15] and in Erbil city [16] Relatively lower percentages ranging from 24.5%-78.3% were obtained with other studies from India. [17-20] Wood's lamp is not the confirmatory test for PV and imperceptible or doubtful lesions are more visible by this method. It can detect sub-clinical infection, the extent of infection and *Malassezia* folliculitis from other causes of folliculitis. [21]

Wood's lamp examination does not cause any pain to patients and does not need any preparation before the test. It can point to the exact site to collect specimens there by increasing the yield for positive results. [7]

The negative results in this study may be due to a recent bath taken by the patient as the water soluble pigment (pityrialactone) responsible for the fluorescence may be washed off or may be due to non-fluorescent strains.

CONCLUSION

The diagnostic efficacy of Wood's lamp is comparable to KOH. It provides

rapid results and can be very useful in detecting sub-clinical as well as the extent of infection. Moreover, it can point to the precise site to collect specimens. So, we recommend this technique for diagnosis of pityriasis versicolor especially before specimen collection for microscopy and culture.

REFERENCES

1. Gaitanis G, Magiatis P, Hantschke M, Bassukas ID, Velegaki A. The *Malassezia* genus in skin and systemic diseases. *Clin Microbiol Rev.* 2012;25(1):106-41.
2. Morais PM, Cunha MGS, Frota MZM. Clinical aspects of patients with pityriasis versicolor seen at a referral center for tropical dermatology in Manaus, Amazonas, Brazil. *An Bras Dermatol.* 2010;85(6):797-803.
3. Crespo Erchiga V, Guého E. Superficial diseases caused by *Malassezia* species. 10 ed. Merz WG HR, editor. London: Hodder Arnold; 2005.
4. Gupta LK, Singhi MK. Wood's lamp. *Indian J Dermatol Venereol Leprol.* 2004 Mar-Apr;70(2):131-5.
5. Veasey JV, Miguel BAF, Bedrikow RB. Wood's lamp in dermatology: applications in daily practice. *surg Cosmet Dermatol* 2017;9(4):324-6.
6. Wigger Alberti W, Elsnor P. Fluorescence with Wood's light. Current applications in dermatologic diagnosis, therapy, follow-up and prevention. *Hautarzt* 1997, Aug 48: 523-7.
7. Asawanonda P, Taylor CR. Wood's light in dermatology. *Int J Dermatol.* 1999;38(11):801-7.
8. Klatte JL, van der Beek N, Kemperman PM. 100 years of revised. *J Eur Acad Dermatol Venereol.* 2015;29(5):842-7
9. Larone DH. Medically important fungi: a guide to identification. 3 ed. Washington DC: American Society of Microbiology; 1995. 3rd edn. Washington DC, ASM press: 1995; 83 p.116
10. Remya VS, Arun B, Karunakaran U et al. Cellophane tape Pugh's staining a novel contrast staining method for rapid detection of fungal elements of *Malassezia* in Pityriasis versicolor. *Int J Health Sci Res.* 2017; 7(11):42-46.
11. Mayser P, Gaitanis G. Physiology and biochemistry. In: Boekhout T, Guého-Kellermann E, Mayser P, Velegaki A, editors. *Malassezia and the Skin.* Berlin: Springer; 2010. p. 121-37.
12. Krishan K, Badgal A, Dogra D, Dogra N. A Single Centre Study on Epidemiological and Clinical Aspects of Pityriasis Versicolor and Prevalence of Other Dermatoses with High Sebum Production. *SJAMS.* 2015;3(2D):810-2.
13. Shah A, Koticha A, Ubale M, Wanjare S, Mehta P, Khopkar U. Identification and speciation of *Malassezia* in patients clinically suspected of having pityriasis versicolor. *Indian J Dermatol.* 2013;58(3):239.
14. Krisanty RI, Bramono K, Made Wisnu I. Identification of *Malassezia* species from pityriasis versicolor in Indonesia and its relationship with clinical characteristics. *Mycoses.* 2009;52(3):257-62
15. Banerjee S. Clinical profile of pityriasis versicolor in a referral hospital of West Bengal. *J Pak Assoc Dermatol.* 2011;21(4):248-5
16. Abdullah AM, Sulaiman AA. Morphological and pigmentary variation of pityriasis versicolor in Erbil city. *J Kerb Uni.* 2013 11(3):8-12.
17. Abdullah AM, Sulaiman AA. Morphological and pigmentary variation of pityriasis versicolor in Erbil city. *J Kerb Uni.* 2013 11(3):8-12.
18. Ratheesh TP, Anu B, Elizabeth, Sourabh AP. Clinical, Epidemiological and Mycological Study of Tinea Versicolor. *J Evol Med Dent Sci.* 2014;3(44):10796-803.
19. Saurabh S, Deshpande A, Deshpande S, Amladi S, Shastri J. The role of mycological investigations in the diagnosis of Pityriasis Versicolor and Seborrheic Dermatitis. *IJBAMR.* 2014;4(1):315-23.
20. Kabbins JS, Vijaya D, Meundi MD, Leelavathy B, Kabbins JS. A Clinicomycological Study of Pityriasis Versicolor with a Special Reference to the Calcofluor White Stain. *J Clin Diagn Res.* 2011;5(7):1356-8.
21. Rao GS, Kuruvilla M, Kumar P, Vinod V. Clinico-epidermiological studies on tinea versicolor. *Indian J Dermatol Venereol Leprol.* 2002;68(4):208-9.
22. Chander J. *Malassezia* infections. In *Textbook of medical mycology.* 2002:92-102.

How to cite this article: Remya VS, Arun B. Diagnostic efficacy of Wood's lamp examination compared with KOH wet mount for diagnosis of pityriasis versicolor cases. *Int J Health Sci Res.* 2019; 9(4):27-30.
