ORIGINAL ARTICLE ASIAN JOURNAL OF MEDICAL SCIENCES

Clinicomycological study of pityriasis versicolor

Anaz KK[1], Mary Vineetha[2], Celine MI[3]

[1]Consultant, Department of Dermatology, Co-operative Hospital Vatakara, Kerala, India, [2]Associate Professor, [3]Professor, Department of Dermatology,Co-operative Hospital Vatakara, Government Medical College, Kottayam, Kerala, India

Submission: 14-01-2022 Revision: 04-05-2022 Publication: 01-06-2022

ABSTRACT

Background: Pityriasis versicolor (PV) is a mild chronic infection of the skin caused by *Malassezia* yeasts, and characterized by discrete or confluent scaly, discolored or dyspigmented areas, mainly on the upper trunk. Wood's lamp examination and potassium hydroxide (KOH) smear are essential tools to diagnose certain cases of PV. KOH smear examination is simple but may be difficult to interpret sometimes. Lactophenol cotton blue (LPCB) mount helps to visualize the hyphae and spores more clearly[4]. Hence, this study was conducted to assess the clinical features, epidemiological factors as well as KOH smear and LPCB findings in cases of PV. **Aims and Objectives**: To study the clinicomycological and epidemiological profile of PV in patients attending the department of Dermatology and Venereology, Government medical college, Kottayam. **Materials and Methods:** A descriptive cross-sectional study was done for a period of 18 months. All clinically diagnosed cases of PV were included in the study. A detailed history taking and clinical examination to asses the epidemiological parameters and to find any predisposing factors was done. Scrapings were taken for KOH smear demonstration and LPCB mount. The characteristics of hyphae were studied. **Results:** Peak incidence of disease was seen in 2nd and 3rd decade with a male preponderance. Most of the patients were asymptomatic with hypopigmented type on the trunk with positive stretch sign. Seborrheic dermatitis was the most common association. KOH mount and LPCB stain demonstrated hyphae in more than 90%. **Conclusion**: PV is a disease of younger age with hypopigmented macule on trunk being the commonest presentation. KOH mount and LPCB stain are useful tool in diagnosis.

Key words: Pityriasis versicolor; KOH mount; LPCB stain; Woods lamp examination

Access this article online

Website: http://nepjol.info/index.php/AJMS

DOI: 10.3126/ajms.v13i6.42383

E-ISSN: 2091-0576

P-ISSN: 2467-9100

Copyright (c) 2022 Asian Journal of Medical Sciences

This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

INTRODUCTION

Pityriasis versicolor (PV) is a mild chronic infection of the skin caused by *Malassezia* yeasts and characterized by discrete or confluent scaly, discolored or dyspigmented areas, mainly on the upper trunk. It is usually caused by a lipophilic fungus *Malassezia globosa* and other common agents include *Malassezia* furfur and *Malassezia* sympodialis.[1] It usually infects adults due to increasing sebum secretion after puberty.[2] Predisposing factors include warm, humid environment, heredity, Cushing's disease, immunosuppression, and malnutrition.[3] It has varied clinical presentations. Wood's lamp examination and Potassium hydroxide (KOH) smear are essential tools to diagnose certain cases of PV. KOH smear examination is simple but may be difficult to interpret sometimes. Lactophenol cotton blue (LPCB) mount helps to visualize the hyphae and spores more clearly.[4] Hence, this study was conducted to assess the clinical features, epidemiological factors as well as KOH smear and LPCB findings in cases of PV.

Aims and objectives

To study the clinicomycological and epidemiological profile of PV in patients attending the department of Dermatology and Venereology, Government medical college, Kottayam.

MATERIALS AND METHODS

It was a descriptive cross-sectional study conducted at Department of Dermatology, Government medical

Address for Correspondence:
Dr. Mary Vineetha, Associate Professor, Department of Dermatology, Government Medical College, Kottayam, Kerala, India.
Mobile: +91-9895141974. **E-mail:** drmaryvineetha@gmail.com

college Kottayam for a period of 18 months from January 2018 to June 2019. Patients who had taken treatment in the previous 3 months will be excluded. After getting permission from SRC and IRB all clinically diagnosed cases of PV who satisfy the inclusion criteria were taken up for the study. A preset proforma was used to collect data. A detailed history was taken with special reference to duration, site of onset of lesion, history of intake of immunosuppressive drugs, associated disease like diabetes mellitus, malignancies, seborrheic dermatitis, acne vulgaris, other immunosuppressive conditions, and family history of similar illness. Epidemiological parameters were assessed; socioeconomic status was assessed by the Kuppuswamy scale. Woods lamp examination was done in all cases. Samples were collected for direct microscopy in 10% KOH and LPCB and findings were noted. After cleaning the lesion with spirit, the lesions were scraped using a BP blade, and the specimen was collected in a clean glass slide. 10% KOH one drop added and coverslip placed over it. It was heated gently under flame and was seen under low power and high power microscopy after few minutes to see the presence and features of hyphae.[5]

Similarly, specimen was collected for LPCB staining, the cover slip was sealed with vaseline and seen under low power microscope after 15 min.[6] Data were entered in MS Excel and analyzed using SPSS software 17.

RESULTS

One hundred and seven clinically diagnosed cases of PV who attended out-patient department of Dermatology and Venereology, Medical College Kottayam over a period of 18 months were studied and the following observations were made. The peak incidence of PV was observed in the 2nd (39.25%) and 3rd (23.36%) decades. There were seven patients (6.54%) below 9 years of age and the youngest among these was a 5-year-old child and eldest patient was a male aged 72 years. The total number of males and females in the study were found to be equal with slight variations and the male-female ratio was 1.2:1.

According to Kuppuswamy's classification for assessing socioeconomic status, 34% of the patients belonged to upper-middle class, 11% of patients were lower class. Thirty patients (30.56%) belonged to the upper-lower class status, twenty-six patients (26.75%) were in lower middle class and four patients (3.81%) were in upper-class status. Majority of the patient were asymptomatic 75 (70.09%) and 32 (29.91%) were symptomatic. Most common type of PV was hypopigmented variety (77.04%) (Figure 1) followed by hyperpigmented (9.63%) (Figure 2) and least common type was erythematous variety (5.35%). In majority of cases the duration of disease was <2 months (65.27%), followed by 3–5 months in 24.62% and more than 1 year in 4%. Considering all types PV, the most common site was the upper trunk (28.03%). The next most common site to be affected was the neck (14.95%), followed by arms (11.21%). In 8 cases (7.47%) the site of involvement was the lower trunk. The abdomen was involved in five cases and multiple sites were involved in 13 cases. Hand, groin, genitalia, and other flexures were the site of lesion in 1 case each (0.93%). About93% of patients had the first episode of PV and 7% were recurrent case.

Majority of the patient were using coconut oil (88.78%) followed by olive oil (6.54%) and gingelly oil (4.67%). 64% of patients were not using cosmetics and 35.5% were using cosmetics. History of hyperhidrosis was present in 6.55%. Twenty-seven patients (25.24%) had family history of PV. About 46.73% of patients reported in monsoon season as compared to other climates such as summer (35.51%) and winter (17.75%). Shaving by self was recorded in 49.53%, from barber shop in 35.52% and those by both self and barber shop were 14.95%.

Out of 107 patients, 14.01% of patients had habit of sharing towels and 11.22% had history of sharing clothes. About 64.48% were using loose type of clothes and 45.52% were using occlusive clothing. Majority (72%) were using cotton clothes, 8% were using synthetic clothes and 25% were using both types. Only 14.02% of patients were staying in hostel. Only 14.02% of patients had a history of using topical or systemic antifungal. History of using either topical or systemic steroids was there in 3.73%. Only 2.80% of patients gave a history of use of immunosuppressants. Most common association of PV was seborrhoeic dermatitis (43.93%), followed by acne vulgaris (15.88%), psoriasis (6.54%), and diabetes mellitus (5.60%). Other skin diseases, other fungal infections, and anemia were seen in 3.37% each. 2.80% had atopic

Figure 1: Hypopigmented discrete and confluent pityriasis versicolor

dermatitis. 3 patients (2.8%) were retro positive. Most of the skin lesions had well-defined borders (78.51%) and borders were ill-defined in 21.49%. 85.05% had multiple lesions and only few lesions were there in 14.95%. Among all the patients, discrete lesions were present in 57% and in 13.08% lesions were confluent. Pityrosporum folliculitis was present in 4 patients (3.74%). Stretch sign was positive in 78.51% of patients and it was absent in 21.49%. 78.51% of patients showed scaling over the lesion and it was absent in 21.49%.

Elevated blood sugar level was seen in 5.60%. Spaghetti and meat ball appearance was seen in 92.5%, was absent in 7.5%. Chi-square test showed significant association between hypopigmented PV, recurrent PV, Stretch sign, and KOH positivity with P<0.05. KOH smear was positive in 99 patients (92.52%) with Spaghetti and meat ball appearance and smear was negative in 7.48%. 85.98% showed short filaments of hyphae and 6.54% of patients showed long filaments. Hyphal appearance was coarse in 96.27% and fragmented in 3.73%.

LPCB mount showed the presence of hyphae and spores in 93.45% (Figure 3) and it was absent in 6.55%. Wood's lamp examination of the skin lesion revealed Golden-Yellow Fluorescence in 91.58% and it was absent in 8.42%. There was a significant association between duration of disease and the presence of golden yellow fluorescence in Wood's lamp examination (P<0.007).

Figure 2: Hyperpigmented tinea versicolor

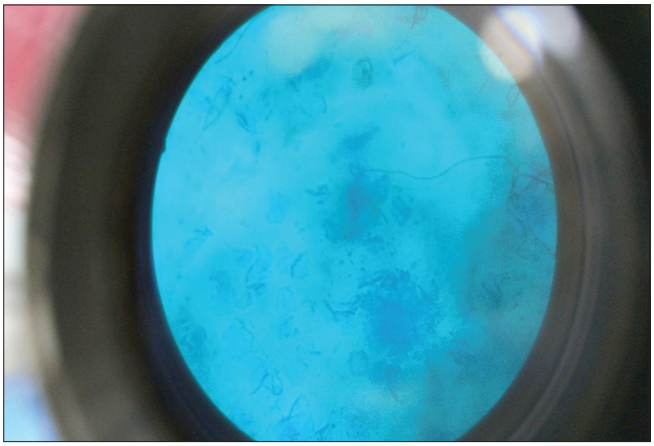

Figure 3: Spores and hyphae in lactophenol cotton blue mount

DISCUSSION

In this study age of the patients varied from 5 to 80 years. The peak incidence of PV was observed in the 2nd (39.25%) and 3rd (23.36%) decades. In a study conducted by Archana et al., most of the patients affected were in 3rd decade (57%).[7] In our study, the total number of males and females were found to be equal with slight variations. Male: Female ratio was 1.2:1, which was in agreement with studies conducted by Kambil,[8] who noticed a male: female ratio of 1.39:1 respectively. But a male predominance was found in Archana et al., study (73%).[7] In studies by Robert et al., Kim et al., and Vijaya et al., males were affected more than females.[9-11] In our study we found that 34% of the patients belonged to upper-middle class. Followed by the upper lower class, lower middle class, lower class, and upper-class status. 11% of patients were lower class and 3.81% were in the upper class. But in study by Sharma et al., 50% of patients were from upper lower and lower socioecomic status.[12]

In our study, majority of the patient were asymptomatic (70.09%). This was in concordance with studies by Razack et al.,[13] and Ingordo et al.,[14] in which also majority of cases were asymptomatic. In Razack et al., study 52.73% of cases were asymptomatic.[13]

In our study, most common type of PV was hypopigmented variety (77.04%) followed by hyperpigmented (9.63%) and least common type was erythematous variety (5.35%). In studies conducted by Sharma et al.,[12] Ghosh et al., and Rao et al., most of the lesions were hypopigmented macules.[15,16] In Rao et al., study 8.3%were hyperpigmented variety.[16] In our study there was significant association between the hypopigmented type of PV and KOH smear positivity (P<0.006). In majority of cases duration of disease was <2 months (65.27%), followed by 3–5 months in 24.62% and more than 1 year in 4%. In study by Ghosh et al., the duration of disease in majority of patients was between 2 weeks and 2 years.[15] In their study patients with more than 10 year duration of the disease was 0.91%.[15] Benerjee et al. reported that duration of disease in 28.75% of patients was between 1 and 20 years.[17]

In our study we found that there was significant association between duration of disease and presence of golden yellow fluorescence in Wood's lamp examination (P<0.007). The most common site of involvement in our study was the upper trunk (28.03%) followed by the neck (14.95%).

The face was involved in 9%. Hand, groin, genitalia were involved only in 1 case each. In a study by Ghosh et al., most of the lesions were seen over the chest in 48.1% followed by face in 46.3% and back in 41.8%.[15] A study by Rao et al., found that the disease occurred most commonly on the neck (71.60%), back (70%), and chest (58.30%).[16] Our study showed that 93% of patients had first episode of PV and 7% were recurrent case. Ghosh et al., found that 48.18% of patients were having recurrent PV.[15] There was a significant association between recurrent case of PV, stretch sign (P=0.047), and KOH positivity (P=0.006). Majority of the patient were using coconut oil (88.78%) followed by olive oil (6.54%) and gingelly oil (4.67%). In our study, there was a significant association between the use of coconut oil and KOH smear positivity (P=0.029). 24.24% of our patients had a family history of PV which was similar to studies conducted by Kambil[8] and Hafez et al.[18] In Rao et al., study family history was seen in 34.22%.[16]

In our study, most cases of PV occurred in monsoon season (46.73%) as compared to other climates such as summer (35.51%) or winter (17.75%). Dutta et al., found that maximum number of the cases presented during the period July to September.[19] Rao et al., reported clustering of cases(35%) during the summer months.[16] Ghosh et al., found that most cases occurred during the months of August, October, and November.[15]

Most common association of PV was seborrhoeic dermatitis (43.93%) and acne vulgaris (15.88%). Diabetes mellitus was associated in 5.60%. In Kambil[8] study association with diabetes mellitus was 35.5% and it was 2.73% in Ghosh et al.,[11] study. In our study, 2.8% of patients had atopic dermatitis and 6.54% had psoriasis. Out of 107 patients, three patients were retro positive. About 2.8% of our patients had a history of use of immunosuppressants. This was in concordance with study by Ghosh et al., in which 2.73% were using immunosuppressants. But in Kambil study 20.58% were using systemic steroids.[8] Seborrhoeic dermatitis and acne vulgaris are associated with seborrhea and increased prevalence of PV in them may be due to the lipophilic nature of *Malassezia*. The etiological agent is also same in seborrhoeic dermatitis and PV.

Surface scaling was present in 80.37% of cases in our study and in Rao et al.,[16] study stretch sign was positive in 78.51%. Out of 107 patients, six patients (5.6%) had random blood sugar more than 200 mg/dl and rest of them was in <200 mg/dl. Meera et al., found that 13% of PV patients had diabetes mellitus.[20] In our study out of 107 patients, 99 cases (92.52%) demonstrated "Spaghetti and meat ball appearance" in KOH smear. This was in concordance with study by Maheswary et al.,[2] who found KOH positivity to be 96%. In Shankar et al.,[21] study KOH smear was positive in 100% cases and in Kindo et al.,[22] study it was 70%. Hyphae were coarse in 96.27% and short filaments were seen in 85.98%. LPCB stain demonstrated hyphae and spores in 92% of cases, similar to KOH smear positivity. So the positivity of KOH smear is comparable to that of LPCB mount.

Golden-Yellow Flourescence was seen in 91.58% of patients in patient with PV. In a study conducted by Kumar et al., Wood's lamp examination showed fluorescence in 77%.[23]

Limitations of the study

Small sample size.

CONCLUSION

PV is a common fungal infection of the skin. It occurs mainly in the 2nd and 3rd decade and less prevalent in elderly. Sex distribution is almost equal with a slight male preponderance. The most common presentation is multiple discrete hypopigmented macules with well-defined borders and positive stretch sign. The upper trunk and neck are the sites commonly affected. Seborrhoeic dermatitis is the most common association, as the etiological agents in both are same, followed by acne vulgaris. Wood's lamp examination shows golden yellow fluorescence in majority of the cases. Spaghetti and meatball appearance can be demonstrated in more than 90% of cases in KOH smear with coarse, short filaments in most, and chance of positivity is high in hypopigmented PV, recurrent PV, and in lesions with positive stretch sign. LPCB mount is also useful as hyphae and spores can be seen clearly and both techniques have comparable results.

ACKNOWLEDGMENT

Nil.

REFERENCES

1. Hay RJ and Ashbee HR. Fungal infections. In: Griffiths CE, Barker J, Bleiker T, Chalmers R and Creamer D, editors. Rook's Text Book of Dermatology. 9th ed., Vol. 1. New York, United States: Wiley Blackwell; 2016. p. 32.10-32.12.
2. Amma SM. Clinical and epidemiological studies on tinea versicolor in Kerala. Indian J Dermatol Venereal Leprol. 1978;44(6):345.
3. Sunenshine PJ, Schwartz RA and Janniger CK. Tinea versicolor. Int J Dermatol. 1998;37(9):648-655. http://doi.org/10.1046/j.1365-4362.1998.00441.x
4. Gupta AK, Batra R, Bluhm R and Faergemann J. Pityriasis versicolor. Dermatol Clin. 2003;21(3):413-429. http://doi.org/10.1016/s0733-8635(03)00039-1

5. Chander J. Fungal reagents and stainings. In: Text Book of Medical Mycology. 3rd ed. India: Mehta Publisher; 2009. p. 514-521.
6. Godkar PB and Godkar DP. Clinical Mycology in Text Book of Medical Laboratory Technology. 2nd ed. New Delhi: Bhalani Publishing House; 2008. p. 593-594.
7. Archana BR, Beena PM and Kumar S. Study of the distribution of *Malassezia* species in patients with pityriasis versicolor in Kolar region, Karnataka. Indian J Dermatol. 2015;60(3):321. http://doi.org/10.4103/0019-5154.156436
8. Kambil SM. A clinical and epidemiological study of pityriasis versicolor. Int J Sci Stud. 2017;5(9):155-159.
9. Robert SO. Pityriasis versicolor: A clinical and mycological investigation. Br J Dermatol. 1969;81(5):315-326. http://doi.org/10.1111/j.1365-2133.1969.tb13990.x
10. Kim HS and Suh MS. A clinical and mycological investigation on Tinea versicolor. Korean J Mycol. 1982;9:199-207.
11. Vijaya D, Nagarathnamma T, Kumar BH, Rajesh R, Satish N, Savitha G, et al. Study of pityriasis versicolor. Antiseptic. 1998;95(4):133.
12. Sharma Y, Jain S, Chandra K and Munegowda KC. A clinico-epidemiologic evaluation of pityriasis versicolor. Indian J Med Sci. 2016;68:63-66.
13. Razack EM and Thambiah AS. A clinical study of pityriasis versicolor in Madras. Sabouraudia. 1977;15:305-311.
14. Ingordo V, Naldi L, Colecchia B and Licci N. Prevalence of pityriasis versicolor in young Italian sailors. Br J Dermatol. 2003;149(6):1270-1272. http://doi.org/10.1111/j.1365-2133.2003.05549.x
15. Ghosh SK, Dey SK, Saha I, Barbhuiya JN, Ghosh A and Roy AK. Pityriasis versicolor: A clinicomycological and epidemiological study from a tertiary care hospital. Indian J Dermatol. 2008;53(4):182-5. http://doi.org/10.4103/0019-5154.44791
16. Rao GS, Kuruvilla M, Kumar P and Vinod V. Clinico-epidermiological studies on tinea versicolor. Indian J Dermatol Venereol Leprol. 2002;68(4):208-209.
17. Banerjee S. Clinical profile of pityriasis versicolor in a referral hospital of West Bengal. J Pak Assoc Dermatol. 2011;21:248-252.
18. Hafez M and El-Shamy S. Genetic susceptibility in pityriasis versicolor. Dermatologica 1985;171(2):86-88. http://doi.org/10.1159/000249397
19. Dutta S, Bajaj AK, Basu S and Dikshit A. Pityriasis versicolor: Socioeconomic and clinic-mycologic study in India. Int J Dermatol. 2002;41(11):823-824. http://doi.org/10.1046/j.1365-4362.2002.01645.x
20. Meera G, Thilak S and Joshua J. A study of 200 cases of pityriasis versicolor: The distribution of age, gender, blood group, lesion morphology, hemoglobin levels, cholesterol levels and diabetic status. Int J Res Dermatol. 2017;3:20-23.
21. Rao IV, Rajeashekar N and Lava R. Mycological study of tinea versicolor. Indian J Dermatol Venereol Leprol. 1997;63(3):168-169.
22. Kindo AJ, Sophia SK, Kalyani J and Anandan S. Identification of the *Malassezia* species. Indian J Med Microbiol. 2004;22(3):179-181.
23. Kumar BC, Gopi A, Harindranath D, Gupta D, Hitha TK and Ul Khair SM. Isolation and speciation of *Malassezia* in patients clinically suspected of pityriasis versicolor. Int J Sci Study. 2015;3(6):54-57.

Authors Contribution:
AKK- Literature review, analysis; **MV-** Preparation of manuscript, analysis; **CMI-** Concept, coordination, revision of manuscript

Work attributed to:
Government Medical college, Kottayam - 686 008, Kerala, India

Orcid ID:
Dr. Anaz KK - https://orcid.org/0000-0002-6143-0069
Dr. Mary Vineetha - https://orcid.org/0000-0002-5295-6093
Dr. Celine MI - https://orcid.org/0000-0001-7108-852X

Source of Support: Nil, **Conflicts of Interest:** None declared.