

Short Research Article

Clinical and Mycological Study of Pityriasis Versicolor in Relation to species

ABSTRACT

Back ground: Pityriasis versicolor is a superficial infection of the skin caused by the yeast of *Malassezia* sp. genus. Although the disease has been described at the beginning of the 19th century, classification of its etiological agent was a matter of debate. There is only scanty information about the epidemiology and ecology of *Malassezia* species available and the clinical significance of the species is not completely recognized.

Aims- To evaluate the clinical & epidemiological pattern and to isolate different species of *Malassezia*. Also to assess the correlation between a particular species and different colours of the lesion.

Results- In this study young people of both sex are most commonly affected. Most of the lesion are hypo-pigmented and affect the upper part of the body. A few flexural lesions are also seen. *M. dermatis* is the most common isolated species. No significant association with color of the lesion and a species was found.

Limitation- Small sample size and difficulty to maintain the culture are two major limitation of this study.

Conclusion: *M. dermatis* was found as the most common species in patients with Pityriasis versicolor. Further studies about species and antifungal sensitivity will help to treat the disease better.

Keywords: *Pityriasis versicolor, malassezia sp, color of lesion, mycological study*

1. INTRODUCTION

Yeast of the genus *Malassezia* are known to be components of the microflora of human skin and that of many warm blooded animals¹. The occurrence of the clinical disease by *Malassezia* depends on the factors permitting the conversion of saprophytic yeast phase to the mycelial phase. Best known and frequent is Pityriasis versicolor². It is a chronic superficial infection of skin caused by the yeast of *Malassezia* sp. genus, which is a commensal of keratinized layer of skin. It is a common dermatoses in tropical region, where humidity and temperature increases its prevalence. It has a worldwide prevalence of up to 50% in the hot and humid environment and as low as 1% in cooler climates. Skin lesions of pityriasis versicolor presented with different colored

21 lesions. The color of patches vary from almost white to pink to reddish brown or fawn
22 colored. There has been several mechanisms postulated for the alterations in pigmentation,
23 like the production of dicarboxylic acids by *Malassezia* species which cause competitive
24 inhibition of tyrosinase³. *M.globosa* and *M.restricta* are the most frequently isolated species
25 from patients with pityriasis versicolor⁴.

26 The purpose of the present study is to isolate different species of *Malassezia* from pityriasis
27 versicolor lesion and to assess the association between the species and the clinical profile
28 particularly the color of the lesion.

29 **2. MATERIAL AND METHODS**

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31 **2.1 PATIENT SELECTION**

32 Clinically diagnosed patients having pityriasis versicolor among out patients of the
33 department of dermatology in a tertiary care hospital in Kerala, India.

34 Study period-January 2014- September 2015 (number of patients -66)

35 Epidemiological tool- descriptive cross sectional study.

36 **2.2 SAMPLE COLLECTION**

37 After obtaining informed consent, the epidemiological data and profile of the patient
38 in terms of gender, age, occupation, socioeconomic status were collected. Details regarding
39 the personal habits like the use of medicated oils, sunscreen, nature of sweating, use of
40 occlusive clothing, characteristics of the workplace, practice of sports, personal hygiene,
41 past history and family history of the disease were recorded. With regard to the type of lesion
42 data were recorded in terms of duration, colour, number, sites involved and symptomatology.

43 Scrapings were taken from the scaliest sites by the use of sterile blades and samples
44 were subjected to microscopy examination using 10% KOH . The diagnosis of pityriasis
45 versicolor was established by the presence of both hyphae and spores in direct microscopy.
46 Scraping were taken from the microscopically diagnosed patients for culture and transported
47 to microbiology lab in sterile Petri dishes.

48 The samples were plated on to Sabouraud's dextrose agar containing
49 chloramphenicol and gentamicin layered with sterile olive oil and were incubated at 32 °C.

The specimen were also incubated on modified Dixon's agar plate containing chloramphenicol and gentamicin and were incubated at 32 °C. The inoculated plates were observed every day for the suspected growth of *Malassezia* for 7 days .

2.3 SPECIATION

1. The gross morphology of suspected colonies of *Malassezia* was noted and further speciated by performing catalase test, Esculin hydrolysis test and temperature tolerance test.

2. Utilization of Tween 20 ,40, 60 and 80 were detected by a standard procedure and based on the results, speciation was done .

3. STATISTICAL ANALYSIS

Statistical analysis was done using Pearson's χ^2 test and P values were calculated.

Kruskal Wallis test is used to find the association between *Malassezia* species and mean age of the patient. A P value of < 0.05 was considered significant.

3. RESULTS AND DISCUSSION

Sixty six patients diagnosed as pityriasis versicolor both clinically and microscopically (KOH smear showed short hyphae), who attended the out patient department from January 2014 to June 2015 were included in the study .Skin scrapings were taken from all 66 patients for culture and speciation.

Of the 66 patients 32 were males and 34 were females . Age of patient ranged from 8 to 74 . Maximum number of patients were young in the age group of 19-29. Most of the patients were non-professional followed by students.

93.9% of patients gave the history of cosmetics like Talcum powder, oil, soap , deodorant etc., and 69.7% patients use synthetic dressings. And good percentage of patients gave history of sun exposure and excessive sweating.

12.1% of our patients had family history of pityriasis versicolor. 33.3% had past history of pityriasis versicolor. 40% patients had the lesions for more than 1 year. 59% patients had normal skin texture. That main complaint of the patient was only discoloration.

79 A small percentage (12.12%) had coexisting seborrheic dermatitis. And only a very few
80 patients had systemic illnesses like diabetes mellitus.

81 Most (56%) of the patients presented with hypo-pigmented lesion, yellow white in
82 color, followed by different shades of hyperpigmentation. Upperpart of the body like face,
83 neck and trunk are most commonly involved. No patients had lesion in the lower limbs or
84 groin.

85 42 out of 66 (63.63%) samples of skin scrapings were able to identify *Malassezia*
86 species. *Malassezia dermatis* (19/42) was the most common species isolated followed by
87 *Malassezia globosa*. *M.sloofiae*, *M.furfur*, *M.obtusa* and *M.restricta* were the other species
88 isolated.

89 In this study, no significant difference was found in species isolated with the clinical
90 type and the anatomical site of lesions. Also no significant association was found with age,
91 gender, use of cosmetics, skin type, life style, with the frequency of species.

92 Although pityriasis versicolor has worldwide occurrence, its frequency is variable and
93 depends on different climatic, occupational and socio-economic conditions. Our study
94 showed equal frequency of the disease among male and females. Many studies shows
95 higher prevalence in male subjects, while in other studies female patients were more
96 affected^{5,6}. Apparently there is no predominance between genders. Male predominance
97 seen in certain studies may be due to the fact that they are involved in more outdoor
98 activities.

99 Maximum number of patients in our study were younger age group [39.3% between
100 10-30]. Similar findings were published by many workers^{7,8}. This may be due to the fact
101 increased sebum production in adolescents and young adults, which favors the growth of
102 *Malassezia*.

103 As per the questionnaire, we observed a few common habits of the study population.
104 Sun exposure was seen in a high frequency of study population(64.6%) . Use of cosmetics
105 are also attributed to the development of pityriasis versicolor by altering the skin microform

and pH. In our study 93.9% of patients use some form of cosmetics either oil, soap, powder etc.

Most of the patients in our study had normal (59%) skin texture followed by oily and dry. This finding is similar to study done by Ghosh et al⁹. 12.2% patients of our study had coexisting seborrheic dermatitis. Similar coexistence was also noted by other workers also. In the present study, only a small number of patients (4.5%) had coexisting systemic diseases like Diabetes mellitus. This is similar to the study by Ghosh SK et al⁹. where 2.73% had diabetes mellitus.

Most of the lesions of pityriasis versicolor were hypopigmented, Almost similar observation was done by Krishnan et al¹¹. In the present study common sites of affection are trunk, neck and face. Flexural involvement (axilla, groin) was also not rare. Lower part of the body (below waist) was not at all involved. Similar findings were also noted by Dutta et al¹¹, Rao et al¹² and Krishnan et al¹⁰.

Regarding the pattern of lesion, most of our study subjects had nummular pattern (69.7%) of lesions followed by circinate and follicular pattern. This is similar to the findings of study by Motto MP et al¹³.

We reported *Malassezia dermatis* to be the predominant isolate grown in 19 (45.23%) patients. This is in contrast with all other studies. Most of the studies reported *Malassezia globosa* as the predominant species and a few studies reported *Malassezia sympodialis* to be the predominant isolate. Dutta et al¹¹, Chaudhary et al¹⁴, and Nakabayashi et al¹⁵, in their studies have reported *M.globosa* as the predominant isolate. However, Gupta et al¹⁶ in their research reported *M. sympodialis* as the predominant isolate followed by *M.globosa* and *M.furfur*. Difference in the frequency of species we got in our study was probably due to the difference in environmental factors such as high temperature and high humidity in our area.. *M.sympodialis* was not isolated from any of the lesion, even though it was reported as the second commonest in most other studies. *M.furfur* is responsible for PV especially in tropical countries. Dutta et Al¹¹ and Tarazooie et al¹⁷ have reported *M.furfur* to

be the second most frequent species isolated from PV patients. However in the present study it is the fourth most common agent.

M.dermatis was the predominant isolate from both hypopigmented and hyperpigmented lesions. No specific relation with *Malassezia* species and the color of lesion was noted so far. The hypopigmentation induced by these fungus can be explained on the basis of production of dicarboxylic acids, main component of which is azealic acid. This acid acts through competitive inhibition of DOPA tyrosinase and perhaps has direct cytotoxic effect on hyperactive melanocytes. The pathogenesis of hyperpigmentation is also unknown but it may be due to increased thickness of the keratin layer and more pronounced inflammatory cell.

4.CONCLUSION

The present study suggests *M.dermatis* to be the most prevalent species, followed by *M.globosa*, *M.sloofiae*, *M.furfur*, *M.obtusa* and *M.restricta*. No statistically significant association was found with a particular species with age, sex, personal habits uses of cosmetics, site of lesion or color of lesion. However, more studies with larger samples have to be performed to clarify the investigated subject. Since *Malassezia* species show different response to antifungal therapy, correct identification of *Malassezia* species may help in the selection of appropriate antifungals. Thus correct identification of *Malasezia* species and antifungal susceptibility tests could facilitate selection of appropriate antifungal agents.

REFERENCES

1. Raabe P, Mayser P, Weiss R. Demonstration of *Malassezia furfur* and *M. sympodialis* together with *M. Pachydermatis* in Veterinary specimens. *Mycoses* 1998;41:493-500.
2. Mayser P, Willed G, Imkamp A, Thomas W, Arnold N, Monsees T. Synthesis of flurochromes and pigments in *Malassezia* by use of tryptophan as the single nitrogen source. *Mycoses* 1998;41:265-271.

3. Nazarro-Porro M, Passi S. Identification of tyrosinase inhibitors in cultures of *Pityrosporum*. *J invest Dermatol* 1978;71:205-208.
4. Midgley G, Gueho E and Guillot J. Disease caused by *Malassezia* species. In: Ajello L, Hay RJ, editors. *Topely and Wilson's Microbiology and microbial infections, Medical Mycology*. 9th ed. London: Arnold; 1998. p. 201-214.
5. Kordbacheh P, Zaini F, Tarazooie KF, Zomorodian, Saadat H, Zeraati Z. Study of the distribution of *Malassezia* species in patients with pityriasis versicolor and healthy individuals in Tehran, Iran. *Bmc Dermatology* 2004;4:5.
6. Nikipoor N, Lepard B. Fungal disease in Shiraz Pahlavi med. J 1978: 901:27-49.
7. Gupta AK, Kohil Y, Faergemann J. Epidemiology of *Malassezia* yeasts associated with pityriasis versicolor in Ontario, Canada *med Mycol* 2001;39:199-206.
8. Makni F, Ben Salah I, Affers M. Identification des espèces de *Malassezia* isolées des lésions de pityriasis versicolor et des sujets sains dans la région de Sfax (Tunisie). *Abst FSMM J mycol Med* 2004;14:159.
9. Ingrodo V, Naldi L, Colecchia B, Licci N. Prevalence of pityriasis versicolor in young Italian sailors. *Br J Dermatol* 2003;149:1270-2.
10. Krishnan A, Thapa DM. Morphological and pigmentary variations of *Tinea versicolor* in south Indian patients. *Indian J Dermatol*. 2003;48:83-6.
11. Dutta S, Bajaj AK, Basu S. Pityriasis versicolor: socio-economic and clinicomycologic study in India. *Int J Dermatol* 2002;41:823-824.
12. Rao GS, Kuruvilla M, Kumar P, Vinod V. Clinico epidemiological studies on *Tinea Versicolor*. *Indian J dermatol, Venerol, Leprol* 2002; 68: 208-9.
13. Morais PM, Cunha MGS, Frola 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.
14. Choudhary R, Singh S, Banerjee T, Tilak R. Prevalence of different *Malassezia* species in Pityriasis Versicolor in Central India. *Indian J Dermatol Venereol Leprol*. 2010; 76:159-164.

- 191 15. Nakabayashi A, Sei Y, Guillot J. Identification of *Malassezia* sp isolated from
192 patients with seborrhoeic dermatitis, Atopic dermatitis, Pityriasis Versicolor and
193 normal subjects. *Med Mycol* . 2000;38:337-341.
- 194 16. Gupta AK, Kohli Y, Faergemann J . Epidemiology of *Malassezia* yeasts associated
195 with pityriasis versicolor in Ontario, Canada. *Med Mycol* 2001;39:199–206.
- 196 17. Tarazooie B, Kordbacheh P, Zaini F, Zomorodian K, Saadat F, Zeraati H, et al. Study
197 of the distribution of *Malassezia* species in patients with pityriasis versicolor and
198 healthy individuals in Tehran, Iran. *BMC Dermatol* 2004;4:5.