

Clinical and Mycological Study of Pityriasis Versicolor in Relation to species

ABSTRACT

Background: 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 colors 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 commonly isolated species. No significant association with the color of the lesion and a species was found.

Limitation: Small sample size and difficulty to maintain the culture are two major limitations 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 the tropical region, where humidity and temperature increase its prevalence. Although some of the currently recognized species can survive even a temperature of 37⁰c, many isolates from human skin are more limited in their temperature tolerance. 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 lesions. The color of patches varies from

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

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

2. MATERIAL AND METHODS

2.1 PATIENT SELECTION

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

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

Epidemiological tool- descriptive cross-sectional study.

2.2 SAMPLE COLLECTION

After obtaining approval from the institutional ethical committee and informed consent from the patients, the epidemiological data and profile of the patient in terms of gender, age, occupation, and socioeconomic status were collected. Details regarding the personal habits like the use of medicated oils, sunscreen, nature of sweating, use of occlusive clothing, characteristics of the workplace, the practice of sports, personal hygiene, past history and family history of the disease were recorded. With regard to the type of lesion, data were recorded in terms of duration, color, number, sites involved and symptomatology.

Scrapings were taken from the scaliest sites by the use of sterile no.15 blades and samples were subjected to microscopy examination using 10% KOH. The diagnosis of pityriasis versicolor was established by the presence of both hyphae and spores in direct microscopy. Scrapings were taken from the microscopically diagnosed patients for culture and transported immediately to microbiology lab in sterile Petri dishes.

The samples were plated same or next day on to Sabouraud's dextrose agar containing chloramphenicol and gentamicin layered with sterile olive oil and were incubated at 32°C. The specimen was also incubated on modified Dixon's agar plate containing chloramphenicol and gentamicin and were incubated at 32 °C. The inoculated plates were

61 kept in biosafety chamber and observed every day for the suspected growth of Malassezia
62 for 14 days.

63

64 2.3 SPECIATION

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

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

71

72 Table-1&2 represent the scheme used for the identification of Malassezia species

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Table - 1

Species	Growth on SDA	Growth on Dixon at			Utilization of tween			
		32 ⁰ c	37 ⁰ c	40 ⁰ c	Tw 20	TW 40	TW 60	TW880
M.pachydermatis	+	+	+	+	+	+	+	+
M.sympodialis	-	+	+	+	-	+	+	+
M.globosa	-	+	-	-	-	-	-	-
M.dermatis	-	+	+	+	+	+	+	+
M.furfur	-	+	+	=	+	+	+	+
M.sloofiae	-	+	+	+	+	+	+	+
M.obtusa	-	+	-	-	-	-	-	-
M.restricta	-	+	+	-	-	-	--	-

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Table - 2

Species	Esculin	Polyetoxylated castor oil	Catalase reaction
M.pachydermatis	+	+	+
M.sympodialis	+	-	+
M.globosa	-	-	+
M.dermatis	-	-	+
M.furfur	-	+	+
M.sloofiae	-	-	+
M.obtusa	+	-	+
M.restricta	-	-	-

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 outpatient 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. A 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 a good percentage of patients gave a history of sun exposure and excessive sweating (87.8%).

12.1% of our patients had a family history of pityriasis versicolor. 33.3% had past history of pityriasis versicolor. 40% patients had the lesions for more than a year. 59% of patients had normal skin texture. Majority of patients complained only of discoloration. A small percentage (12.12%) had coexisting seborrheic dermatitis. And only a very few patients had systemic illnesses like diabetes mellitus.

Most (56%) of the patients presented with a hypo-pigmented lesion, yellow-white in color, followed by different shades of hyperpigmentation. Upperpart of the body like face, neck and trunk are most commonly involved. None of the patients had lesions in the lower limbs or groin.

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

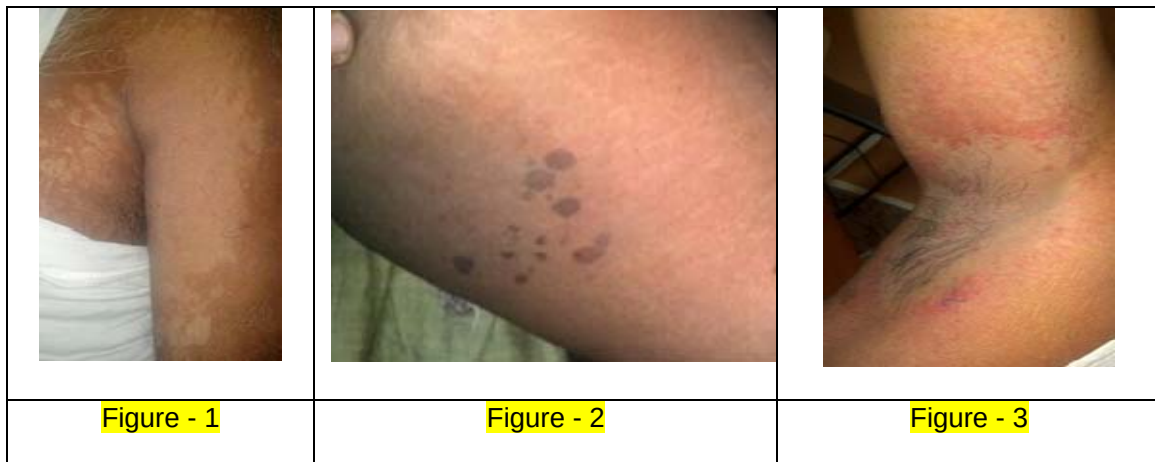
In this study, no significant difference was found in species isolated with the clinical type and the anatomical site of lesions. Also no significant association was found with age, gender, use of cosmetics, skin type, life style, with the frequency of species.

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

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123 A maximum number of patients in our study were younger age group [39.3% between 10
124 and 30]. Similar findings were published by many workers^{7, 8} this may be due to the fact
125 increased sebum production in adolescents and young adults, which favors the growth of
126 *Malassezia*.

127
128 As per the questionnaire, we observed a few common habits of the study population. Sun
129 exposure was seen in a high frequency of study population (64.6%). Use of cosmetics is
130 also attributed to the development of pityriasis versicolor by altering the skin microform and
131 pH. In our study, 93.9% of patients use some form of cosmetics either oil, soap, powder etc.
132 Most of the patients in our study had normal (59%) skin texture followed by dry (23%) and
133 oily (18%). This finding is similar to study done by Ghosh et al⁹. 12.2% patients of our study
134 had coexisting seborrheic dermatitis. Similar coexistence was also noted by other workers
135 also. In the present study, only a small number of patients (4.5%) had coexisting systemic
136 diseases like Diabetes mellitus. This is similar to the study by Ghosh SK et al⁹ where 2.73%
137 had diabetes mellitus.

138
139 Most of the lesions of pityriasis versicolor were hypopigmented, an almost similar
140 observation was done by Krishnan et al¹¹. In the present study, common sites of affection
141 are trunk, neck and face. Flexural involvement (axilla, groin) was also not rare. The lower
142 part of the body (below waist) was not at all involved. Similar findings were also noted by
143 Dutta et al¹¹, Rao et al¹² and Krishnan et al¹⁰. (Figures 1, 2, 3 represent hypopigmented,
144 erythematous & hyperpigmented lesions of Pityriasis versicolor in different body parts).



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147 Regarding the pattern of the lesion, most of our study subjects had a nummular pattern
 148 (69.7%) of lesions followed by follicular (9%) and circinate (3%) pattern. This is similar to the
 149 findings of the study by Motto MP et al¹³.

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151 We reported *Malassezia dermatis* to be the predominant isolate grown in 19 (45.23%)
 152 patients. This is in contrast with all other studies. Most of the studies reported *Malassezia*
 153 *globosa* as the predominant species and a few studies reported *Malassezia sympodialis* to
 154 be the predominant isolate. Dutta et al¹¹, Chaudhary et al¹⁴, and Nakabayashi et al¹⁵, in their
 155 studies, have reported *M.globosa* as the predominant isolate. However, Gupta et al¹⁶ in their
 156 research reported *M. sympodialis* as the predominant isolate followed by *M.globosa* and
 157 *M.furfur*. The difference in the frequency of species we got in our study was probably due to
 158 the difference in environmental factors such as high temperature and high humidity
 159 (Averages 86⁰F & 78% humidity during summer months) in our area. *M.sympodialis* was not
 160 isolated from any of the lesion, even though it was reported as the second commonest in
 161 most other studies. *M.furfur* is responsible for PV, especially in tropical countries. Dutta et
 162 Al¹¹ and Tarazooie et al¹⁷ have reported *M.furfur* to be the second most frequent species
 163 isolated from PV patients. However, in the present study, it is the fourth most common
 164 agent.

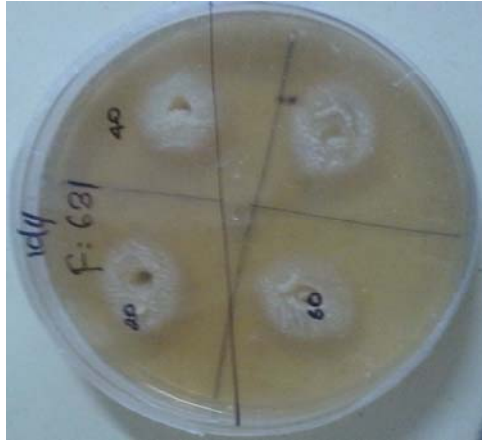


Figure-4: Tween assimilation pattern of M. dermatis

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

4. CONCLUSION

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

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