

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. Although some of the currently recognized species can survive even a temperature of 37°C, 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 vary from almost white to pink to reddish brown or fawn colored. There has 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 out patients 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 institutional ethical committee and informed consent from the patients , the epidemiological data and profile of the patient in terms of gender, age, occupation, 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, 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, colour, 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. Scraping were taken from the microscopically diagnosed patients for culture and transported **Immediately** to microbiology lab in sterile Petri dishes.

51 The samples were plated same or next day on to Sabouraud's dextrose agar
 52 containing chloramphenicol and gentamicin layered with sterile olive oil and were incubated
 53 at 32 °C. The specimen were also incubated on modified Dixon's agar plate containing
 54 chloramphenicol and gentamicin and were incubated at 32 °C. The inoculated plates were
 55 kept in biosafety chamber and observed every day for the suspected growth of Malassezia
 56 for 14 days .

57

58 2.3 SPECIATION

- 59 1. The gross morphology of suspected colonies of Malassezia was noted and further
 60 speciated by performing catalase test, Esculin hydrolysis test and temperature
 61 tolerance test.
- 62 2. Utilization of Tween 20 ,40, 60 and 80 were detected by a standard procedure and
 63 based on the results, speciation was done

64 Table-1&&2 Represent the scheme used for the identification of Malassezia
 65 species

66 Table -1

Species	Growth on SDA	Growth on modified Dixon at			Utilization of tween			
		32°C	37°C	40°C	Tw 20	TW 40	TW 60	TW 80
M.pachydermatis	+	+	+	+	+	+	+	+
M.sympodialis	-	+	+	+	-	+	+	+
M.globosa	-	+	-	-	-	-	-	-
M.dermatis	-	+	+	+	+	+	+	+
M. furfur	-	+	+	=	+	+	+	+
M.slooffiae	-	+	+	+	+	+	+	+
M.obtusa	-	+	-	-	-	-	-	-
M.restricta	-	+	+	-	-	-	--	-

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69 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	-	-	-

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71 **3.STATISTICAL ANALYSIS**72 Statistical analysis was done using Pearson's χ^2 test and P values were calculated.

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

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76 **3. RESULTS AND DISCUSSION**

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78 Sixty six patients diagnosed as pityriasis versicolor both clinically and microscopically
79 (KOH smear showed short hyphae), who attended the out patient department from January
80 2014 to June 2015 were included in the study .Skin scrapings were taken from all 66
81 patients for culture and speciation.

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

85 93.9% of patients gave the history of cosmetics like Talcum powder, oil, soap ,
86 deodorant etc., and 69.7% patients use synthetic dressings. And good percentage of
87 patients gave history of sun exposure and excessive sweating (87.8%).

88 12.1% of our patients had family history of pityriasis versicolor. 33.3% had past
89 history of pityriasis versicolor. 40% patients had the lesions for more than 1 year. 59%
90 patients had normal skin texture. That main complaint of the patient was only discoloration.

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

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

97 42 out of 66 (63.63%) samples of skin scrapings were able to identify *Malassezia*
98 species. *Malassezia dermatis* (19/42) was the most common species isolated followed by
99 *Malassezia globosa*. *M.sloofiae* ,*M.furfur*, *M.obtusa* and *M.restricta* were the other species
100 isolated.

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

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

111 Maximum number of patients in our study were younger age group [39.3% between
112 10-30]. Similar findings were published by many workers^{7,8}. This may be due to the fact
113 increased sebum production in adolescents and young adults, which favors the growth of
114 *Malassezia*.

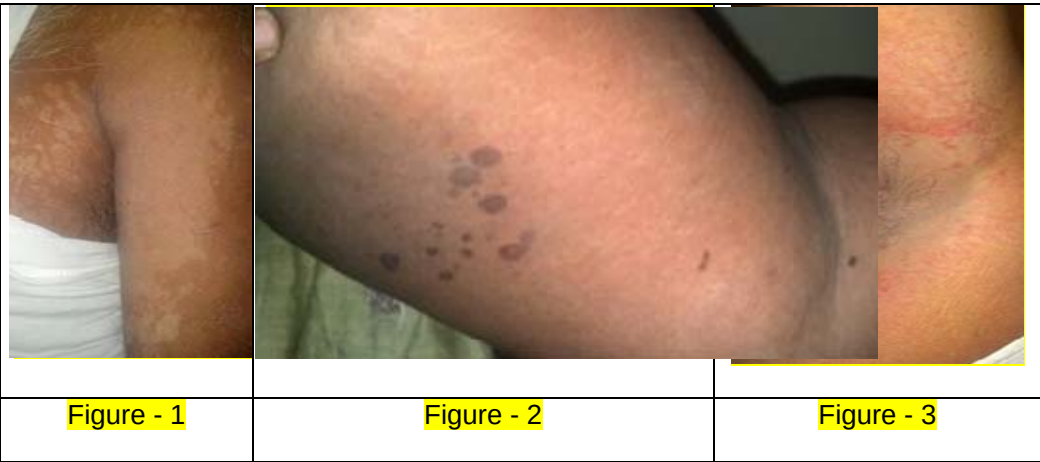
115 As per the questionnaire, we observed a few common habits of the study population.
116 Sun exposure was seen in a high frequency of study population(64.6%) . Use of cosmetics
117 are also attributed to the development of pityriasis versicolor by altering the skin microform

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

120 Most of the patients in our study had normal (59%) skin texture followed by dry(23%) and
121 oily (18%). This finding is similar to study done by Ghosh et al⁹. 12.2% patients of our study
122 had coexisting seborrheic dermatitis. Similar coexistence was also noted by other workers
123 also. In the present study, only a small number of patients (4.5%) had coexisting systemic
124 diseases like Diabetes mellitus. This is similar to the study by Ghosh SK et al⁹.where 2.73%
125 had diabetes mellitus.

126 Most of the lesions of pityriasis versicolor were hypopigmented, Almost similar
127 observation was done by Krishnan et al¹¹. In the present study common sites of affection are
128 trunk, neck and face. Flexural involvement (axilla, groin) was also not rare. Lower part of the
129 body (below waist) was not at all involved. Similar findings were also noted by Dutta et al¹¹,
130 Rao et al¹² and Krishnan et al¹⁰ . (Figures 1),2,) 3) represent hypopigmented, erythematous
131 &hyperpigmented lesions of Pityriasis versicolor in different body parts).

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134 Regarding the pattern of lesion, most of our study subjects had nummular pattern
135 (69.7%) of lesions followed by follicular(9%) and circinate (3%) pattern. This is similar to the
136 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 (Averages 86°F & 78% humidity during summer months) 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.

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 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.

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