



A Clinical and Epidemiological Study of Pityriasis Versicolor in Baghdad City

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Abstract

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BACKGROUND: Pityriasis versicolor (PV) is a common and chronic superficial mycosis seen in all age groups and characterized by dyspigmented lesions caused by dimorphic lipophilic yeast.

AIM: The aim of the study was to study the clinical aspects, prevalence, and demographic data of patients with PV in Baghdad City.

MATERIALS AND METHODS: Total of 175 patients with PV attending the department of Dermatology at Al Imamein Al Kadhemein Medical City and Alkarama Teaching Hospital in Baghdad city from January 2019 to January 2020 were included in this study. Diagnosis was done clinically. Interviews with patients were done using a questionnaire designed by the researcher.

RESULTS: From 175 patients with PV, there were 71 (40.6%) males and 104 (59.4%) females. The mean age was 23.97 ± 10.25 years. The majority of cases 71 (40.6%) were 21–30 years. Eighty-one (46.3%) patients were presented from April to June. Itching presented in 21.7% of patients. The majority of patients (48.6%) presented with hyperpigmented type. Neck was the most common site to be involved in 101 patients (57.7%).

CONCLUSION: The most common age group affected was 21–30 years. Females were commonly affected. Peak incidence was observed in April–July months. Neck was the most common site affected. Hyperpigmented type is more commonly presented type.

Introduction

Pityriasis (tinea) versicolor is a mild, chronic, superficial, and recurring fungal infection of the stratum corneum [1]. Tinea versicolor occurs worldwide, with a high rate (20–50%) in tropical areas and it is more frequently occur in the tropical regions with higher temperatures and higher relative humidities [2], [3].

It is caused by lipophilic yeasts of *Malassezia* genus which are dimorphic, lipophilic fungus which are the endogenous saprophytes of commensal members of the normal skin flora. It needs predisposing factors for multiplication and subsequent conversion from the commensal (saprophytic yeast) yeast form to the mycelial phase (pseudo-filamentous parasitic form) which is associated with clinical disease [4], [5]. The risk factors are warm, humid environment, heredity, profuse sweating, a malnourished state, immunosuppression, Cushing's disease, pregnancy, and the use of oral contraceptive pills [4], [6], [7].

Clinically, the disease is usually asymptomatic (some patients complain of mild pruritus) with patients seeking medical attention for cosmetic purposes. Lesions are characterized by scattered or confluent, finely scaly, dyspigmented oval to round macular

skin lesions most often occurring on the upper trunk, neck, and extremities. The color of skin lesions varies from almost white to pink, fawn, to reddish brown. It becomes more visible with a sun exposure and is more common in teenagers and young adults than in older patients. Similar to other investigations the highest prevalence of Pityriasis versicolor (PV) was observed in 20–30 year-old group, suggesting that the peak of the infection is coincided with ages when the sebum production is in the highest level. Very few cases of PV in a child <10 years age are found. Moreover, it is rarely seen in older adults [8], [9].

The dicarboxylic acids which is produced by *malassezia* yeast may have a cytotoxic effect on melanocytes and inhibit tyrosinase enzyme. There is a reduction in number, size, and accumulations of melanosomes in melanocytes and in surrounding keratinocytes. These lead to hypopigmented macules [10], [11], [12]. Residual hypopigmentation, without overlying scale, may remain for many months following effective treatment. These areas may become more apparent after suntan, causing the patient to incorrectly suspect recurrence of the infection [12].

The upper trunk is affected most commonly, but spread to the upper arms, antecubital fossae, neck, abdomen, and popliteal fossae often occur. Lesions in

the axillae, groin, thighs, and genitalia may occur but are less common. Facial, scalp, and palmar lesions occur in the tropics but rarely in temperate zones. Uncommon but possible locations include axilla, popliteal fossa, fore arms, lower limbs, and penis/genitalia [13]. Clinically suspected cases can be confirmed by microscopic study of KOH preparation of scales scraped from the surface of skin lesion. Microscopy is reported as positive if hyphae and yeast cells are seen; they resemble “spaghetti and meatballs”. In contrast to dermatophyte infections, a negative microscopic examination virtually excludes the diagnosis [13], [14].

Due to widely different environmental factors, epidemiological and clinical presentation of PV will vary from one geographical area to another. Hence, we undertook this study to find out the clinical aspects, prevalence, and demographic data of the patients with PV in Baghdad City.

Materials and Methods

One hundred and seventy-five patients with clinical diagnosis of PV who attended the department of Dermatology and Venereology at Al Imamein Al Kadhemein Medical City and department of Dermatology and Venereology at Alkarama Teaching Hospital in Baghdad city in the periods from January 2019 to January 2020 were enrolled.

The diagnosis of PV was done by dermatologist on clinical basis and established by wood’s lamp of the skin lesion for suspected cases in a dark room to accentuate pigment changes. Interviews with the patients were done using a questionnaire designed by the researcher and data were collected individually at the time of the diagnosis. Patient’s information including age, sex, residence, and previous family history were recorded. A thorough clinical history was taken in all the patients.

An Ethical Committee clearance was obtained and an Ethical Committee approved consent form was used while conducting the study. The data were analyzed using Statistical Package for the Social Science Software (SPSS version 23). We applied the Chi square test (χ^2 test), where $p < 0.05$ was considered statistically significant.

Results

Demographic and clinical data of participants were presented in Table 1 and Figure 1.

Neck was the most common site to be involved in 101 patients (57.7%) followed by face 98 (56%),

Table 1: Demographic and clinical data of participants

Demographic and clinical data	No. (total No. = 175)	%
Gender		
Male	71	40.6
Female	104	59.4
Duration of disease		
<1 year	52	29.7
1–2 years	36	20.6
2–4 years	63	36.0
>4 years	24	13.7
Month of presentation		
January–March	21	12
April–June	81	46.3
July–September	50	28.6
October–December	23	13.1
Residency		
Rural	50	28.6
Urban	125	71.4
Occupation		
Indoor	90	51.4
Outdoor	85	48.6
Itching		
No	137	78.3
Yes	38	21.7
Family History of PV		
No	137	78.3
Yes	38	21.7
Dermatological disorders		
Acne	18	10.3
SD	14	8.0
Dermatophytosis	6	3.4
Atopic Dermatitis	6	3.4
LP	4	2.3
General disorders		
Diabetes mellitus	3	1.7
Chronic Kidney disease	2	1.1
Hypothyroidism	2	1.1
Using steroids	2	1.1
Malignancies	1	0.6
Site		
Neck	101	57.7
Face	98	56.0
Chest	87	49.7
Back	75	42.9
Upper Limb	57	32.6
Abdomen	25	14.3
Lower Limb	19	10.9
Axilla	9	5.1
Groin and Genital	5	2.9

chest 87 (49.7%), back in 75 (42.9%) patients, upper limbs in 57 (32.6%), abdomen in 25 (14.3%) patients, lower limbs in 19 (10.9%), axilla in 9 (5.1%), and groin and genital 5 (2.9%). Our results showed no statistical significance regarding predilection sites and gender (Table 1 and 2).

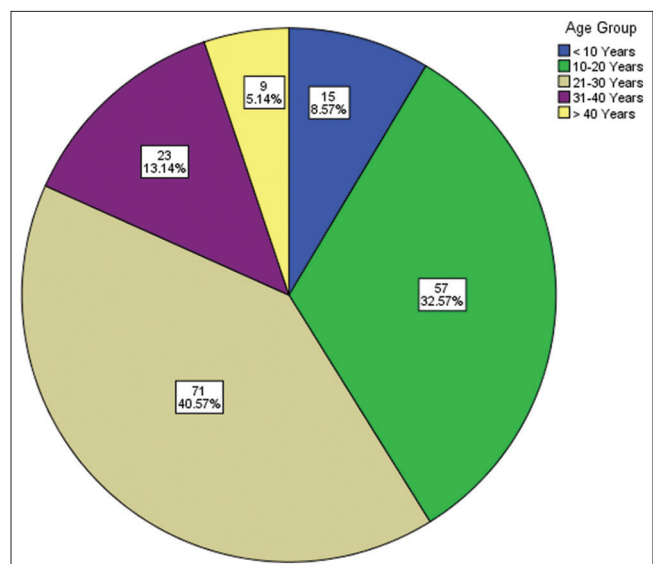


Figure 1: Frequency of age groups

Table 2: Frequency of affected sites with PV according to gender

Site	Gender				Total		p-value*
	Male		Female		No.	%	
	No.	%	No.	%			
Face							
No	30	42.3	47	45.2	77	44.0	0.741
Yes	41	57.7	57	54.8	98	56.0	
Neck							
No	29	40.8	45	43.3	74	42.3	0.750
Yes	42	59.2	59	56.7	101	57.7	
Abdomen							
No	59	83.1	91	87.5	150	85.7	0.414
Yes	12	16.9	13	12.5	25	14.3	
Chest							
No	39	54.9	49	47.1	88	50.3	0.310
Yes	32	45.1	55	52.9	87	49.7	
Back							
No	40	56.3	60	57.7	100	57.1	0.859
Yes	31	43.7	44	42.3	75	42.9	
Upper Limb							
No	48	67.6	70	67.3	118	67.4	0.967
Yes	23	32.4	34	32.7	57	32.6	
Lower Limb							
No	63	88.7	93	89.4	156	89.1	0.885
Yes	8	11.3	11	10.6	19	10.9	
Axilla							
No	66	93.0	100	96.2	166	94.9	0.347
Yes	5	7.0	4	3.8	9	5.1	
Groin and Genital							
No	68	95.8	102	98.1	170	97.1	0.369
Yes	3	4.2	2	1.9	5	2.9	

*p value by Chi-squared test.

The majority of the patients (85; 48.6%) presented with hyperpigmented type of PV while 60 (34.3%) had hypopigmented type of PV and 16 (9.1%) patients had erythematous type and 14 (8%) had mixed type. Most patients (19.43%) with hypopigmented PV were skin Type IV and 31.43% with hyperpigmented lesion were skin Type III (Figure 2; p = 0.0001).

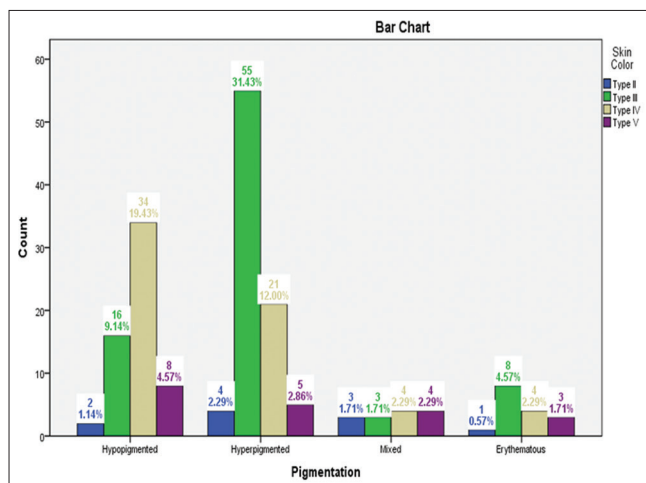


Figure 2: Distribution of types of PV according to skin color. (p value = 0.0001; p value by Chi squared test)

Months of presentation had no effect on incidence of PV in regarding to type of occupation whether outdoor or indoor activities. Most cases were between April and June (81; 46.2%) and least presentation between January and March (21; 12%) (Figure 3).

Itching was presented mostly in males (52.6%) than females (47.4%). Family history of PV was positive in (18.4%) of patients with itchy lesions. Itching was significantly associated with PV during hot humid months from April to September (65.7%; p value

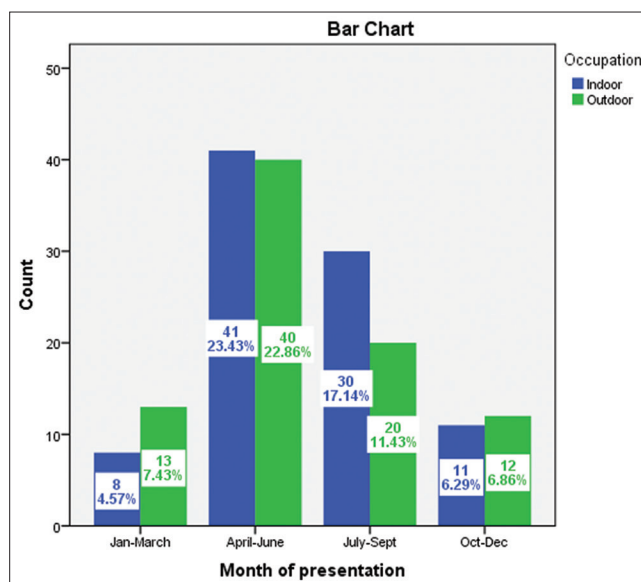


Figure 3: Effect of occupation on PV presentation according to seasons. (p value = 0.376; p value by Chi-squared test)

0.046). Itching was mostly presented in hypopigmented than hyperpigmented lesions (47.4% and 39.5%, respectively). Patients with skin Type III were mostly had itching (10.9%) and Type II with least presentation (0.6%). Occupation, associated medical illnesses, and age of the patients had no effect on presentation of itching. AD patients were mostly presented with itching (15.8%) when compared to other dermatological disorders (p value 0.001) (Table 3).

Regarding pigmentation of PV, the most affected age group was between 21 and 30 years (71; 40.6%) and 36% of cases with 2–4 years duration. Thirty-four (56.7%) of hypopigmented PV were skin color Type IV and 64.7% of hyperpigmented PV were skin Type III. There is significant difference between type of PV and skin color with p value 0.0001.

Most cases of hypopigmented PV and hyperpigmented PV were females (61.7% and 62.4%, respectively). As well as most cases of hypopigmented PV and hyperpigmented PV were from urban (61.7% and 70.6%) but still no statistical significant differences were seen (p value were 0.456 and 0.592, respectively). All types of PV were mostly presented between April and June (46.7% hypopigmented; 45.9% hyperpigmented; 35.7% mixed, and 56.3% erythematous) but also still statistically not significant when compared to other seasons. Occupation and associated dermatological illnesses were not statistically different between types of PV (p value 0.295 and 0.430, respectively) (Table 4).

Discussion

PV occurs most commonly in adolescent and young adult, in whom sebum production is higher

Table 3: Frequency of gender, family history of PV, seasons, PV types, skin color, age group, occupation, and associated disorders according to associated itching

Parameter	Itching		p-value*
	No.	%	
Gender			
Male	20	52.6	0.087
Female	18	47.4	
Family History of PV			
No	31	81.6	0.578
Yes	7	18.4	
Month of presentation			
January–March	6	15.8	0.046
April–June	14	36.8	
July–September	11	28.9	
October–December	7	18.4	
Pigmentation			
Hypopigmented	18	47.4	0.256
Hyperpigmented	15	39.5	
Mixed	3	7.9	
Erythematous	2	5.3	
Skin Color			
Type II	1	0.6	0.388
Type III	19	10.9	
Type IV	16	9.1	
Type V	2	1.1	
Associated disorders			
None	35	92.1	0.314
DM	1	2.6	
CKD	0	0.0	
Hypothyroidism	0	0.0	
Using steroids	1	2.6	
Malignancies	1	2.6	
Occupation			
Indoor	24	63.2	0.102
Outdoor	14	36.8	
Age Group			
<10 Years	4	10.5	0.229
10–20 years	16	42.1	
21–30 years	10	26.3	
31–40 years	7	18.4	
>40 years	1	2.6	
Associated dermatological disorders			
SD	2	5.3	0.001
Dermatophytosis	1	2.6	
LP	1	2.6	
Acne	1	2.6	
AD	6	15.8	

*p value by Chi-squared test.

than in other age groups and seems to correlate with increased colonization by *pityrosporum* with increasing age [15], [16], [17]. Our study, 21–30 years age group was most frequently affected with 40.6% patients. The overall mean age observed was 23.97 ± 10.25 years. Arwa (2010) [15] in her study also observed similar findings as majority of cases (41%) occurred in the age group of 21–30 years. Moreover, Snekvalli *et al.* (2018) found that 43% of cases aged 21–30 years [18]. Krishnan and Thapa (2004) [19] found that 15–29 years old is the most common age group suggesting that the peak of infection coincides with the sebum production and hormonal influence.

This study found that females (59.4%) were presented more than males. This result agreed with Febriyanti *et al.* (2018) [20]. Other series reported that sexes are equally affected in adults and are usually established by early 20s [10], [21]. Several studies mentioned that males experience more than females due to their physical activities. As PV is mostly asymptomatic, the female patients may not need to consult early, especially when lesions occur in the covered areas and they do not pay attention to cosmetic problem unless it occurs on exposed areas. However, males may experience more due to a more secretions of sebaceous glands [22], [23].

In early cases, the lesions started as perifollicular macules and then they became patches with skip regions of normal skin in between. The color may vary according to patient's normal pigmentation, exposure to sun, and to the severity of the disease. In the beginning, it is stated that the lesions are often red to light brown, the majority then become hyperpigmented. PV in dark-skinned patients may be associated with the greatest apparent visualization of lesions, causing a social and emotional stress when extensive dyspigmentation happens in these people. Thus, it was believed that patients of dark skin seek medical care more often than white patients when suffering from this disease [2], [14], [24]

Our study showed that the majority of cases were hyperpigmented lesions 85 (48.64%), hypopigmented lesions 60 (34.3%), erythematous 16 (9.1%), and mixed lesions were observed in 14 (8%) patients. These results agreed with an Iraqi study [15] that showed that 66% of cases were hyperpigmented. Other studies showed hypopigmented lesions as more common presentation (48.34–84%) [16], [18], [19], [25].

This variation of color could be explained by the differences in climatic conditions and different study population skin color of the native populations. Various mechanisms have been postulated as causes of hypo and hyperpigmentation in PV. Azelaic acid produced by *Malassezia* species causes competitive inhibition of tyrosinase and results in hypopigmentation [16], [19], [25]

About occupation, our study showed no effect of outdoor activities on presentation of PV. Further studies with detailed activities and large number of sample may be needed.

In this study, neck (57.7%) was the most common site to be involved followed by face (56%), chest (49.7%), and back (42.9%). These results were similar to the previous studies [26], [27], [28], [29].

The increased frequency of involvement of the trunk, face, and neck may be explained by the presence of higher density of sebaceous glands in these regions. The distribution of lesions depends on the distribution and number of sebaceous glands in that particular site. However, in the literature, there are reports of cases showing lesions in unusual anatomic sites, which were also observed along our study, as groin, genitals, legs, feet, and hands [30], [31], [32], [33].

PV is mostly an asymptomatic infection, with pruritus being present only in a small proportion of patients. Pruritus occurs particularly during sweating and the intensity is usually mild. Even in this study, the majority of the patients were asymptomatic and had come only because of their cosmetic concern. Pruritus was present in 21.7% patients near to the observations made by Snekvalli *et al.* (2018), Hasan *et al.* (2014), (39.1%) and Rao *et al.* (2002), (30%).

The mean duration of the disease in this study was 2.18 ± 1.5 years. Our results showed that the

Table 4: Frequency of age group, duration of PV, skin color, residency, gender, occupation, and associated disorders according to color of PV

Variables	Pigmentation										p-value*
	Hypopigmented		Hyperpigmented		Mixed		Erythematous		Total		
	No.	%	No.	%	No.	%	No.	%	No.	%	
Age Group											
<10 Years	4	6.7	8	9.4	2	14.3	1	6.3	15	8.6	0.689
10–20 years	21	35.0	27	31.8	4	28.6	5	31.3	57	32.6	
21–30 years	23	38.3	38	44.7	5	35.7	5	31.3	71	40.6	
31–40 years	10	16.7	6	7.1	3	21.4	4	25.0	23	13.1	
>40 years	2	3.3	6	7.1	0	0.0	1	6.3	9	5.1	
Duration											
<1 year	20	33.3	24	28.2	4	28.6	4	25.0	52	29.7	0.578
1–2 years	10	16.7	16	18.8	5	35.7	5	31.3	36	20.6	
2–4 years	22	36.7	30	35.3	4	28.6	7	43.8	63	36.0	
>4 years	8	13.3	15	17.6	1	7.1	0	0.0	24	13.7	
Skin Color											
Type II	2	3.3	4	4.7	3	21.4	1	6.3	10	5.7	0.001
Type III	16	26.7	55	64.7	3	21.4	8	50.0	82	46.9	
Type IV	34	56.7	21	24.7	4	28.6	4	25.0	63	36.0	
Type V	8	13.3	5	5.9	4	28.6	3	18.8	20	11.4	
Residency											
Rural	15	25.0	25	29.4	6	42.9	4	25.0	50	28.6	0.592
Urban	45	75.0	60	70.6	8	57.1	12	75.0	125	71.4	
Gender											
Male	23	38.3	32	37.6	8	57.1	8	50.0	71	40.6	0.456
Female	37	61.7	53	62.4	6	42.9	8	50.0	104	59.4	
Month of presentation											
January–March	8	13.3	9	10.6	3	21.4	1	6.3	21	12.0	0.953
April–June	28	46.7	39	45.9	5	35.7	9	56.3	81	46.3	
July–September	16	26.7	25	29.4	5	35.7	4	25.0	50	28.6	
October–December	8	13.3	12	14.1	1	7.1	2	12.5	23	13.1	
Occupation											
Indoor	32	53.3	42	49.4	10	71.4	6	37.5	90	51.4	0.295
Outdoor	28	46.7	43	50.6	4	28.6	10	62.5	85	48.6	
Associated dermatological disorders											
None	44	73.3	61	71.8	10	71.4	12	75.0	127	72.6	0.430
Seborrheic dermatitis	5	8.3	9	10.6	0	0.0	0	0.0	14	8.0	
Dermatophytosis	4	6.7	2	2.4	0	0.0	0	0.0	6	3.4	
LP	1	1.7	1	1.2	1	7.1	1	6.3	4	2.3	
Acne	3	5.0	9	10.6	3	21.4	3	18.8	18	10.3	
Atopic Dermatitis	3	5.0	3	3.5	0	0.0	0	0.0	6	3.4	

*p value by Chi-squared test.

majority (69.3%) were for more than one year. Mahmoud Abadi *et al.* (2009) [34] discovered that 51.7% of cases were more than 6-week duration. Because the most of the cases are asymptomatic or that associated with mild itching as well as usually occur in non-exposed area, most of our patients neglected it and did not consult the doctor early.

The majority of the patients belonged to urban population (71.4%) and this was due to the fact that our center caters predominantly to urban and semi-urban populations. This result agreed with Snekavalli *et al.* (2018) study that showed 65% of cases were urban population.

A positive family history was observed in 21.7% of patients in accordance with the studies done by Snekavalli *et al.* (31%), Ghosh *et al.*, (25.5%), Hasan *et al.*, (26.6%), and Kambil *et al.*, (34.2%) [16], [17], [18], [26]. Moreover, Hafez *et al.* (1985), found a positive family history in 39% of patients and reported that there was a polygenetic and multifactorial inheritance [35]. He *et al.* (2007), observed that the patients with a positive family history had an early age of onset, higher recurrence, and longer duration of infection [36].

The highest rate of onset of the infection occurred between April and June (46.3%) compared to (13.1%) from October to December and this result agreed with Snekavalli *et al.* [18]. Furthermore, this finding was in consistence with an Indian study which showed spontaneous remission in winter months in

30% cases. Hence, it may be assumed that hot and humid environment of our country is more important predisposing factor than nature of job [37].

Among the 175 patients, 5.6% patients had systemic associations, of which diabetes mellitus was the most common (1.7%), followed by chronic kidney diseases, hypothyroidism, and using steroids (1.1% for each). This was in accordance with the study conducted by Kambil *et al.*, in which most patients were found to have diabetes mellitus [16].

Acne and seborrheic dermatitis were the most common dermatological association of PV in this study. Both conditions have *Malassezia* species involved in their pathogenesis. Snekavalli *et al.*, Erchiga *et al.*, and Tabaseera *et al.* reported an association of seborrheic dermatitis in 36.2%, 40%, and 31.4% of patients, respectively [18], [38], [39].

Conclusion

PV is a common skin disease seen in dermatology practice of any geographic area. The most common age group affected by PV was 21–30 years. Female gender was commonly affected. Peak incidence of PV was observed in April–July months. Neck was the most common site of presentation of

lesions followed by face and chest. Hyperpigmented type is more commonly presented. Comorbid diseases were associated in 5.71% of the total patients.

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