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Dermatology International	Semiannual	5500	5000	430	391
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Journal of Microbiology and Related Research	Semiannual	8500	8000	664	625
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Pediatric Education and Research	Triannual	7500	7000	586	547
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RFP Indian Journal of Medical Psychiatry	Semiannual	8000	7500	625	586
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Original Article

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The Impact of Pruritus on the Quality of Life of Patients with Chronic Plaque Psoriasis

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Abstract

The concept of Health related quality of life (HROQL) is important consideration in modern era and skin diseases have an definitive impact on HROQL amongst which psoriasis being an common, chronic, mamy times disfiguring and frustrating has very much negative impact on quality of life. This study was conducted keeping the same view which included the assessment of impact of pruritus on QOL with patients of chronic plaque psoriasis to introduce timely psychological support to improve QOL. Three parameters with specifies and well documented evidence were used to assess the psoriasis severity, the degree of itch and QOL and these were Psoriasis area severity index, 5D ithch scale and DQLI repectively. It was found that pruritus severity has a significant and clinically important association with poorer HRQL in patients with CPP as measured by the DLQI. We also observed that pruritus is associated with determinants to emotional well-being as measured by the DLQI and with detrmnants to other realms of mental health, including social functioning. *Study Design:* Prospective Study.

Keywords: Pruritus; Chronic; Plaque Psoriasis.

Introduction

The concept of quality of life encompasses perceptions related to almost all aspects of daily existence. In the medical community, the definition has been narrowed to health related quality of life (HRQL), which may be defined as "optimum level of mental, physical and social functioning, including relationships, and perceptions of health, fitness, life satisfaction and well-being" [1]. Appreciation of the impact of skin diseases on HRQL is relevant to the education of health professionals with reference to the importance of not only quantity but also quality of life. Thus the purpose of this study was to assess the impact of pruritus on quality of life of patients with chronic plaque psoriasis (CPP), to provide early psychological intervention with dermatological treatment for good outcomes.

Material & Methods

The study was conducted from May 2013 to July 2014, a total of 80 patients with chronic plaque soriasis were evaluated under the study in the Department of Dermatology, Venereology and leprosy, Sri Aurobindo Institute of Medical Sciences (SAIMS), Medical College, Indore (MP).

Methods of Collection of Data

1. Copy right permission, for the use of DLQI scale in our study was given by Dermatology, University of medicine Cardiff, Wales, (UK)
2. 80 patients of chronic plaque Psoriasis were evaluated under the study. Relevant history, clinical examination and necessary investigations along with PASI were done for all the patients.
3. Severity of Pruritus was measured using the 5-D Itch scale.
4. Quality of life of all chronic plaque psoriasis patients was evaluated by using Dermatology Life Quality Index (DLQI) structured questionnaire.
5. It will be a prospective study in which patients will be selected randomly and the patients enrolled will be categorized under these.

Arm 1: Patients with mild-moderate Pruritus

Arm 2: Patients with moderate-severe Pruritus

Inclusion Criteria

1. Patients with chronic plaque psoriasis between the age of 16-70 yrs.
2. Chronic plaque psoriasis patient of both sexes were to be evaluated.
3. All newly diagnosed cases, as well as old cases of psoriasis with exacerbations were evaluated under study.
4. Chronic plaque psoriasis involving a minimum 5% body surface area.
5. Chronic plaque psoriasis-associated pruritus, defined as at least 2 episodes of itch per week, the itch occurring several times a day, lasting for more than 5 minutes, being bothersome, and had been present for a minimum of 6 weeks.

Exclusion Criteria

1. All patient of psoriasis below 16 yrs were excluded from the study.
2. All patients not having a minimum 5% BSA involvement.
3. All patients not having pruritus as an accompanying symptom
4. All psoriasis patients who were handicapped or having other chronic debilitating diseases or other associated chronic skin disorders were excluded from the study.

The 5-D itch scale [2], has been developed as a brief but multidimensional questionnaire designed to be useful as an outcome measure in clinical trials.

The five dimensions are degree, duration, direction, disability and distribution.

The scores of each of the five domains are achieved separately and then summed together to obtain a total 5-D score. 5-D scores can potentially range between 5 (no pruritus) and 25 (most severe pruritus). No score of 5 is obtained because presence of pruritus was one of the entry criteria.

Single-item domain scores (duration, degree and direction) are equal to the value indicated below the response choice (range 1–5).

The disability domain includes four items that assess the impact of itching on daily activities: sleep, leisure/social activities, housework/errands and work/school. The score for the disability domain is achieved by taking the highest score on any of the four items.

For the distribution domain, the number of affected body parts is tallied (potential sum 0–16) and the sum is sorted into five scoring bins: sum of 0–2 = score of 1, sum of 3–5 = score of 2, sum of 6–10 = score of 3, sum of 11–13 = score of 4, and sum of 14–16 = score of 5.

In summary, the 5-D is a new tool that can be used to measure pruritus. The 5-D has demonstrated ease of use, content validity, test-retest reliability, internal consistency and ability to detect change in itch over [2]. The DLQI is a compact self-reported questionnaire to measure HRQOL over the previous week in patients with skin diseases. It consists of 10 items covering symptoms and feelings (items 1 and 2), daily activities (items 3 and 4), leisure (items 5 and 6), work and school (item 7), personal relationships (items 8 and 9) and treatment (item 10). Each item is scored on a four point scale, with higher scores indicating greater impairment in HRQOL [3]. The DLQI questionnaire is designed for use in adults, i.e. patients over the age of 16.

Scoring

The scoring of each question is as follows:

Very much- scored 3

A lot- scored 2

A little- scored 1

Not at all- scored 0

Not relevant- scored 0

Question unanswered- scored 0

Question 7(prevented work or study) scored 3

The DLQI is calculated by summing the score of each question resulting in a maximum of 30 and a minimum of 0. The higher the score, the more quality of life is impaired. The DLQI can also be expressed as a percentage of the maximum possible score of 30.

Meaning of DLQI score:

0-1 = no effect at all on patients life

2-5 = small effect on patients life

6-10 = moderate effect on patients life

11-20 = Very large effect on patients life

21-30 = Extremely large effect on patients life

Detailed analysis of the DLQI

The DLQI can be analyzed under six headings as follows:

1. Symptoms/feelings Questions 1 and 2 Score maximum 6
2. Daily activities Questions 3 and 4 Score maximum 6
3. Leisure Questions 5 and 6 Score maximum 6
4. Work/School Question 7 Score maximum 3
5. Personal relationships Questions 8 and 9 Score maximum 6
6. Treatment Question 10 Score maximum 3

Interpretation of incorrectly completed questionnaires

There is a very high success rate of accurate completion of the DLQI. However, sometimes subjects do make mistakes.

If one question is left unanswered this is scored 0 and the scores are summed and expressed as usual out of a maximum of 30.

If two or more questions are left unanswered the questionnaire is not scored.

If question 7 is answered 'yes' this is scored 3. If question 7 is answered 'no' or 'not relevant' but then either 'a lot' or 'a little' is ticked this is then scored 2 or 1.

If two or more response options are ticked, the response option with the highest score should be recorded.

If there is a response between two tick boxes, the lower of the two score options should be recorded.

The DLQI can be analyzed by calculating the score for each of its six sub-scales (see above). When using sub-scales, if the answer to one question in a sub-scale is missing, that sub-scale should not be scored

Result

Table 1: Age-Wise Distribution

Age (in years)	Male	Female	Total	%
18-25	-	-	-	-
26-40	28 (35)	9 (11.25)	37	46.25
41-55	19 (23.75)	7 (8.75)	26	32.5
56-70	12 (15)	5 (6.25)	17	21.25
Total	59	21	80	100
SD	11.6	10.9		

T-Value = 0.73 P-Value = 0.470

In this study, out of 80 patients of chronic plaque psoriasis with associated pruritus 59 were males and 21 were females. Most number of patients showed onset of disease at 26-40 years of age. No Significant difference is observed between males and females with respect to onset age ($p>0.05$) (Table 1).

Table 2: Distribution According to Marital Status & Sex in the Study Group

Marital status	Male	Female	Total	%
Married	41 (51.25)	20 (25)	61	76.25
Unmarried	18 (22.5)	1 (1.25)	19	23.75
Total	59	21	80	100

χ^2= 5.669, p-Value = 0.017 Significant

The significant value ($p<0.05$) shows that there is association between marital status and gender. Male are significantly more than female in both unmarried and married status. In this study, out of 80 patients 76% were Married and nearly 24% were unmarried (Table 2).

Table 3: Educational Qualification

Education	Male	Female	Total	%
Less than higher secondary	15 (18.75)	2 (2.5)	17	21.25
Higher secondary	18 (22.5)	7 (8.75)	25	31.25
College graduate	26 (32.5)	12 (15)	38	47.5
Total	59	21	80	100

χ^2= 2.439, DF = 2, p-Value = 0.295

In this study group 26% of the males and 15% of females were college graduates and 22.5% males and neatly 9% females had cleared their higher secondary respectively. Nearly, 19% males and 2.5% females were educated less than higher secondary. There is no association between the education qualification and gender distribution (Table 3).

Table 4: Gender Wise Occupation in Study Group

Occupation	Male	Female	Total
Farmer	23	2	25
Office job	19	1	20
Student	6	1	7
Laundry worker	1	-	1
Electrician	4	-	4
House-wife	-	17	17
Cook	1	-	1
Mechanic	1	-	1
Shopkeeper	1	-	1
Construction worker	3	-	3
Total	59	21	80

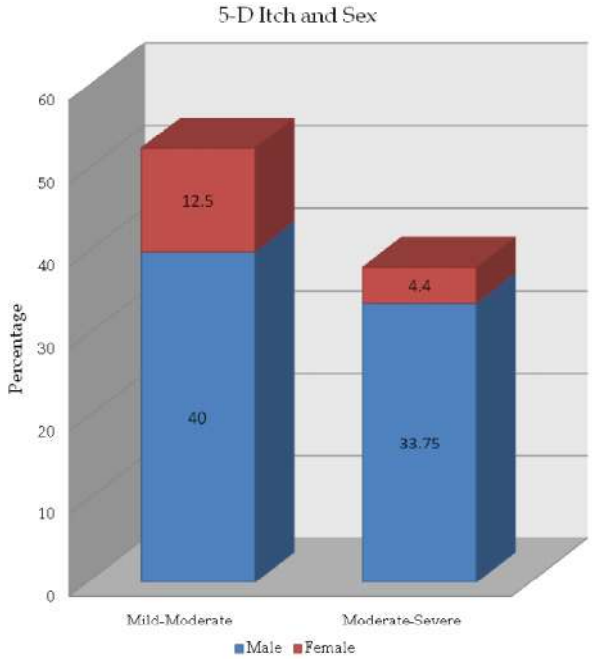
Table 5: Distribution According to 5D-Itch Scale & Sex in the Study Group

5D-ITCH Scale	Male	Female	Total	%
Mild-Moderate	32 (40)	10 (12.5)	42	52.5
Moderate-Severe	27 (33.75)	11 (13.75)	38	47.5
Total	59	21	80	100

$\chi 2$= 0.272, p-Value = 0.602

p>0.05 hence non-significant

In the study group of 80 patients, 40% males and 13% females were in the Mild to moderate group and 34% and 14% were in the moderate to severe group respectively according to the 5-D itch score (Table 4 and 5).



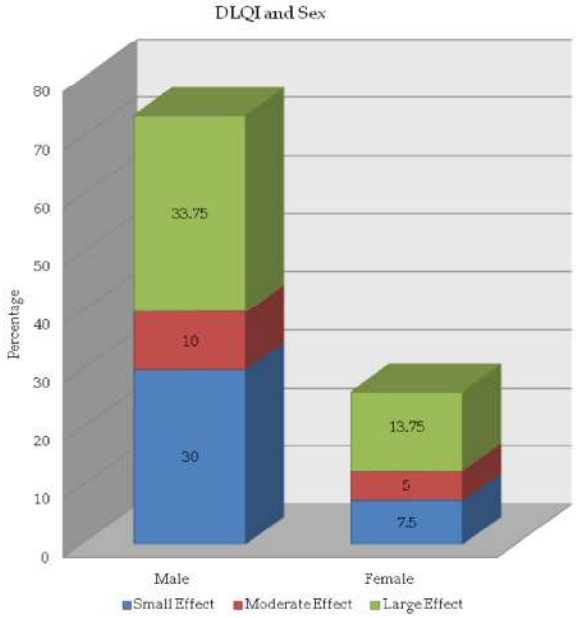
Graph 1: Distribution According to 5D-Itch Scale & Sex in the Study Group

Table 6: Gender Wise Distribution of Dermatology Life Quality Index (DlQI) According to Score

Effect on patients life	DLQI Score range	Male	Female	Total	%
No effect	0-1	-	-	-	
Small effect	2-5	24 (30)	6(7.5)	30	37.5
Moderate effect	6-10	8(10)	4(5)	12	15
Very large effect	11-20	18(22.5)	8(10)	26	32.5
Extremely large effect	21-30	9(11.25)	3(3.75)	12	15
Total				80	100

$\chi 2$= 6.017, p-Value = 0.011

p<0.05 there is significant association between the effects on patients quality of life in both males and females. Out of the 80 patients, Pruritus had small effect on quality of life in 37% patients, moderate effect on 15% patients and severe effect on 47.5% patients (Table 6).



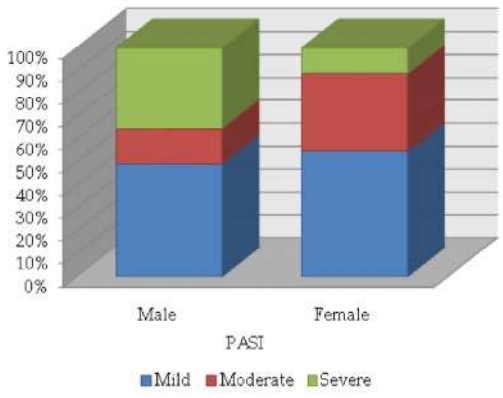
Graph 2: Gender Wise Distribution of Dermatology Life Quality Index (DLQI) According to Score

Table 7: Distribution According to PASI & Sex in the Study Group

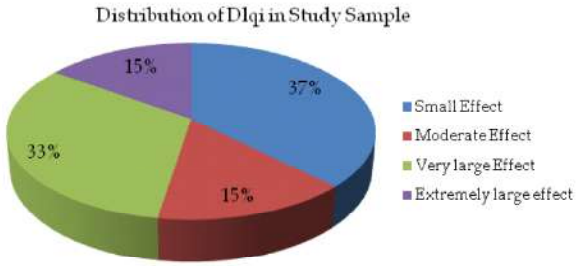
PASI	Male	Female	Total	%
Mild	29 (36.25)	8 (10)	37	46.25
Moderate	9 (11.25)	5 (6.25)	14	17.50
Severe	21 (26.25)	8 (10)	29	36.25
Total	59	21	80	100

$\chi 2$= 1.084, DF = 2, p-Value = 0.582

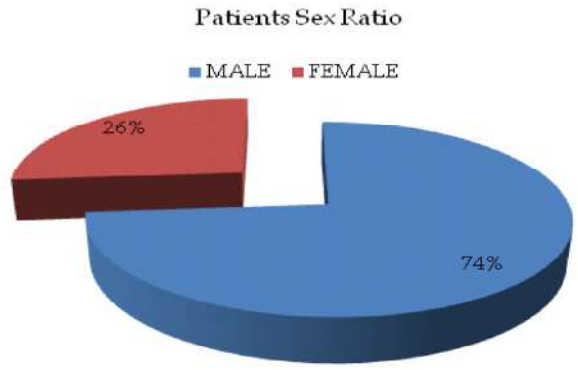
Out of the 80 patients, 46% had mild psoriasis, 17% had moderate psoriasis and around 36% patients had severe psoriasis. p>0.05, hence there was no significant difference in PASI scores and Sex in the study group (Table 7).



Graph 3: Distribution According to PASI & Sex in the Study Group



Graph 4: Distribution Of DLQI In Study Sample



Graph 5: Patients Sex Ratio

Table 8: Correlation Matrix in Study Group

Correlation	5-D ITCH Scale R (P-value)	DLQI Score R (P-value)	PASI Score R (P-value)
5-D Itch Scale	1	0.939 (0.0001)	0.881 (0.0001)
DLQI Score	0.939 (0.0001)	1	0.899 (0.0001)
PASI Score	0.881 (0.0001)	0.899 (0.0001)	1
N	80	80	80

There is a significantly positive ($p<0.05$) correlation between 5-D Itch score and DLQI score, 5-D Itch score and PASI score as well as the DLQI and PASI score (Table 8).

Table 9: Descriptive Statistics

	Mean	Standard Deviation	N
5-D ITCH Scale	13.45	5.930	80
DLQI Score	10.75	7.641	80
PASI Score	19.85	10.177	80

Difference of Levels	T-Value	P-Value
DLQI Score - 5-D Itch Score	-1.95	0.128
PASI - 5-D Itch score	5.20	0.000
PASI - DLQI Score	7.15	0.000

The difference levels of DLQI and the 5-D Itch score was $p>0.05$ hence non-significant where as that of PASI with 5-D Itch score and DLQI respectively was $p<0.05$ hence significant. (Table 9).

Table 10: Comparision of Mean Age in Mild-Moderatand Moderate-Severe Pruritus Cases

Age (Years)	Pruritus	N	Mean	Standard Deviation
Mean Age	Mild-Moderate	42	44.3	11.1
	Moderate-Severe	38	44.5	11.8

T-Value = -0.08, p-Value = 0.934

There is no significant difference in mean age of mild and severe pruritus patients (Table 10).

Discussion

Pruritus is a common and potentially debilitating symptom associated with considerable psychiatric morbidity, sleep disturbances, and an overall reduced health-related quality of life [4,5,6,7,8]. However, there is minimal literature evaluating the overall effect of pruritus on HRQL. In the current study, the 5D-Itch scale score was used to assess the severity of pruritus, PASI score was used to assess the severity of the disease and the DLQI scale was used for assessing the quality of life of chronic plaque psoriasis patients.

1. *Pruritus in CPP patients:*

In this study 100% of patients complained of pruritus. Of whom 52.5% had mild-moderate pruritus and 47.5% had moderate-severe pruritus. Changs S E et al. [9] in their study reported that 73.7% of their psoriasis patients complained of pruritus.

Hanan M. Saleh et al. [10] in their study reported that 50% of their psoriasis patient had pruritus.

The increased incidence and degree of pruritus in patients with psoriasis is strongly correlated to anxious and depressive psychopathology.

Almost one-fourth the subjects in the study were females. Females being housewives and most of the men who were manual labourers who were more stressogenic might have complained of increased pruritus.

Correlation b/w PASI and DLQI scores:

In our study significant correlation was found between the PASI score and the DLQI. Increase in the PASI score was associated with increased affection on quality of life.

Koo et al. [11] in their study showed that there was significant correlation between PASI and DLQI.

Sampogna et al. [12] in their study reported that quality of life instruments like DLQI and Skindex correlated with the PASI and SAPASI scores.

2. Correlation b/w 5-D Itch scale scores and DLQI scores:

Out of 80 patients, psoriasis associated pruritus had small effect on quality of life in 37.5% of the patients, moderate effect on 15% of patients and severe effect on 47.5% of patients. So Psoriasis with associated pruritus affected the QOL in 100% of the patients.

In our study significant correlation was found between the 5-D Itch scale score and the DLQI.

The mean DLQI score was significantly higher in the moderate-severe pruritus group than in the mild-moderate pruritus group. The mean difference between the two groups remained significant ($p<0.0001$).

Sampogna, Picardi et al [13] in their study compared 25 dermatological conditions and showed that pruritus was one of the four deemed to have greatest effect on HRQL.

The results are in agreement with reported assessments in patients with cholestatic liver diease (Younossi et al.) [14], chronic venous insufficiency (Duque et al.) [15], and post renal transplantation (Moloney et al.) [16]: these studies demonstrated pruritus was significantly associated with poorer HRQL using the SF-36, a modified Skindex-16, and the DLQI, respectively.

Thus our study outcomes are similar to the above mentioned study.

Limitations of the Study

1. A larger sample size would have allowed us to gather more data pertaining to this and hence improving results.
2. Other associated questionnaires of Psoriasis with psychiatric co-morbidity especially, anxiety and depression could have given a better outlook on quality of life.

Summary & Conclusion

This study concludes that, pruritus has a significant negative impact on physical, emotional and psychological wellbeing of the affected patients, thus causing a substantial impact on the Quality of life of patients with CPP. There is a significant correlation between pruritus and the QOL. There is also an association of Psoriasis with psychiatric co-morbidity especially, anxiety and depression. The magnitude of this anxiety and depression can be influenced by variables like age, gender, marital status and duration of disease.

We demonstrated that pruritus severity has a significant and clinically important association with poorer HRQL in patients with CPP as measured by the DLQI. The relationship between pruritus and mental health is less clear, however, as we could not demonstrate an association of pruritus severity with the HADS. Further research is warranted in this context since our findings are not in keeping with previous literature suggesting pruritus affects mental health. Further, we observed that pruritus is associated with determinants to emotional well-being as measured by the DLQI and with detriments to other realms of mental health, including social functioning.

In view of this, it is very important to evaluate pruritus and quality of life of psoriasis patients and also screen the patients for associated psychiatric co-morbid conditions like anxiety and depression, before making therapeutic decision.

Many more studies are needed in large group of patients with psoriasis to evolve comprehensive treatment guidelines involving the treatment of pruritus associated with psoriasis in the overall successful management of psoriasis.

Based on this study, we conclude that pruritus which may be underestimated & unaddressed in clinical practice at times, is a potentially serious and debilitating symptom that warrants medical attention and treatment, and further research investment.

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Original Article

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Study of Prick Test in Chronic Spontaneous Urticaria

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Abstract

Urticaria is a fairly common condition affecting 0.1% of the population characterized by transient swellings of the skin. Chronic Spontaneous urticaria has multifactorial aetiologies including intolerance to food or drugs, infectious diseases, and autoimmune processes. Skin prick testing or SPT demonstrates an allergic response to a specific allergen. In conjunction with an allergy focused history, SPT can help to confirm the presence of an allergy to either food, inhaled substance or any other allergen. *Aims and Objective:* To evaluate the types of chronic Spontaneous urticaria with reference to etiology from history and investigations and to identify the specific offending allergen and excluding it to reduce the severity and frequency of episodes of urticaria and angioedema. *Materials and Methods:* A total of 40 patients with chronic spontaneous urticaria of more than six weeks duration were studied. Skin test were performed according to history using Indian standard battery of prick test. *Results:* Out of 40 patients, 28 (60%) showed positive reactions to more than five antigens with maximum reaction to food (in 15 patients), of which sour and fermented foods were the commonest followed by dust and pollen (5 patients each), fungi (1 patient) and insect in 2 (1 each to cockroach & yellow flask) with 12 patients showing no reaction. *Conclusion:* Skin prick test is found to be a simple, quick and inexpensive method for identifying the causative allergen in a majority of the patients.

Keywords: Chronic Spontaneous Urticaria; Skin Prick Test.

Introduction

Urticaria refers to a common, heterogeneous group of disorders with a large variety of underlying causes. It is characterized by the sudden appearance of fleeting wheals, each of which lasts 1-24 hours and/or angioedema lasting up to 72 hours [4].

Chronic spontaneous urticaria, with or without angioedema, has been defined as daily or almost daily symptoms recurring for more than 6 weeks [7].

Etiology of chronic spontaneous urticaria and angioedema till today remains unpredicatble in most of the patients. Several agents and factors including medications, foods and food additives, infections, contactants, inhalants, physical factors and autoimmunity have been implicated in provoking urticaria symptoms. But there are no specific diagnostic or predictive tests that can point out the etiology. Skin prick testing (SPT) can be used as a primary diagnostic method for IgE mediated allergic diseases by demonstrating an allergic response to a specific allergen.

Objective of the Study

To identify the specific offending allergen and excluding it to reduce the severity and frequency of episodes of urticaria and angioedema.

Materials & Methods

Forty (40) patients with chronic spontaneous urticaria were included in the study which was conducted from July '11 to December '12 considering the inclusion and exclusion criteria.

Inclusion Criteria

- Patients with chronic spontaneous urticaria

Exclusion Criteria [6]

- Acute urticaria (less than 6 weeks).
- Urticarial vasculitis.
- Pregnant or lactating women.
- Severely ill and immuno-compromised patients.
- Physical urticaria.
- Informed written consent and a detailed history regarding the various aggravating factors was obtained and prick testing was done using the commonly implicated/ precipitating antigens based on the patient's history with resuscitation facility on standby.

Histamine and Buffered normal saline were used as positive and negative controls respectively. Emergency drugs (for anaphylaxis) were kept ready before starting the procedure.

Pre- requisite for skin prick test

- Antihistamines were discontinued (at least two days prior for short acting antihistamines, 6 days prior for Desloratidine and 2 weeks prior for Doxepin)
- Systemic steroids were discontinued for at least 2 weeks [4,5].
- Forearm should be free of wheals.

Procedure [5]

- The test allergens were selected.
- The skin was coded with a marker pen to identify the allergens to be tested.

One drop of histamine, buffered normal saline and each of the antigens were applied on the volar aspects of forearms, upper arm or back (upper and mid back).

- As few as 3 or 4 or up to about 25 allergens can be tested; superficial prick through the drops at 45 degrees tangentially to the skin was given with a lancet upto 1.5 mm in depth.

Skin Prick Test

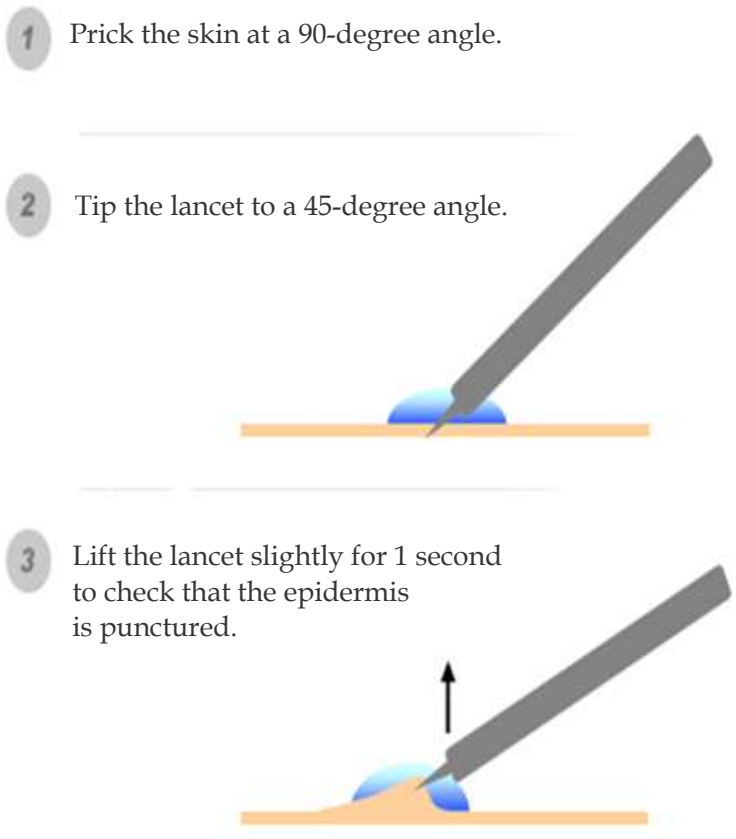

Fig. 1: Skin prick test: How it is Done? [3]

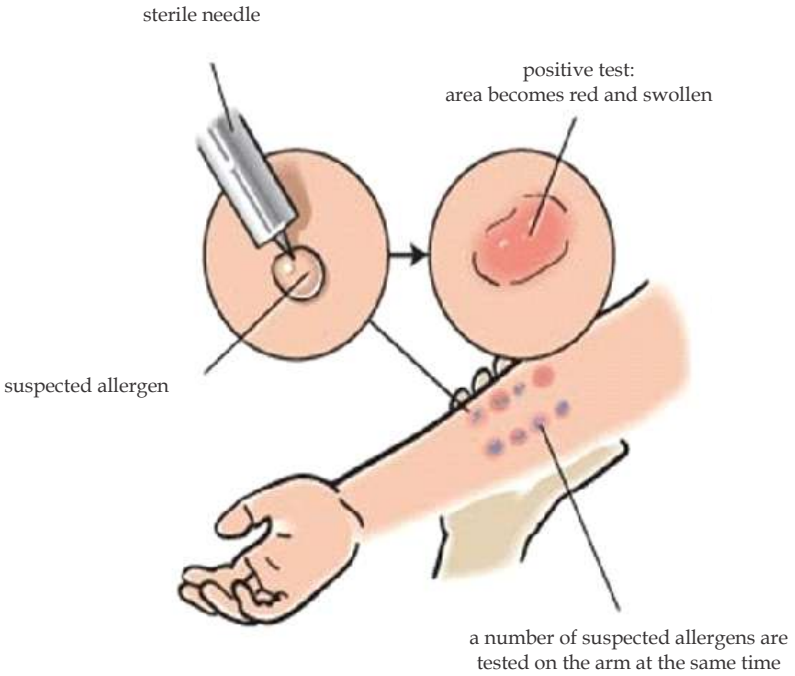

Fig. 2: Prick test and result

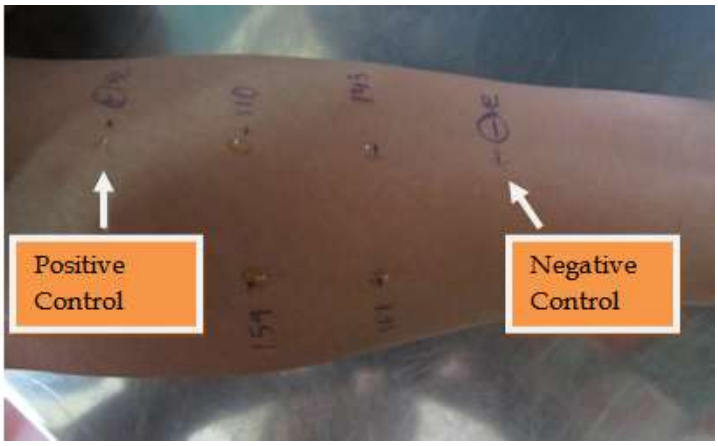

Fig. 3: Prick test done on patient with negative and positive control

Reading Time

15-30 min

Interpretation

An edematous reaction (wheal) of at least 3 mm in diameter or at least half of the size of the histamine control is considered positive in absence of such a reaction in normal saline control [1,5]. All patients showed allergy to prick test allergen were advised to avoid/restrict allergen in diet or avoid contact with relevant allergens. This avoidance and restriction was advised for a period of 6 week. During this period, clinical improvement of patient was evaluated and recorded at weekly interval.

Results

Out of 40 patients 14 were males and 26 females. Female to male ratio was 1.8:1. The average age in all urticaria categories belonged to the 20-40 years age groups. 28 (60%) patients showed reactions to more than five antigens with maximum reaction to foods (in 15 patients), of which sour and fermented foods were the commonest followed by dust and pollen (in 5 patients), fungi (1 patient) and insect in 2(1 each to cockroach & yellow flask) with 12 patients showed no reaction. None of the patients showed anaphylactic reaction. The prick test has a high positive predictive value (69- 100%) [2]. A positive test signifies reactivity to the specific allergen; however a negative test does not definitely exclude it.

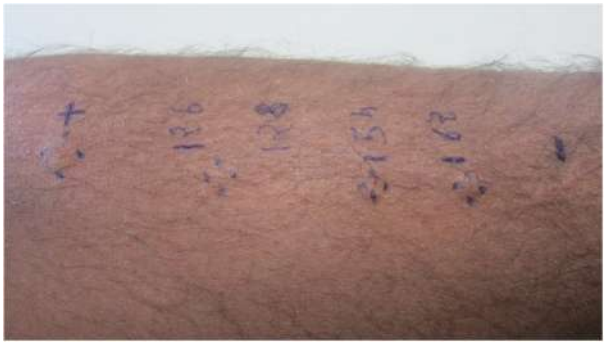

Fig. 4: Showing result of prick test

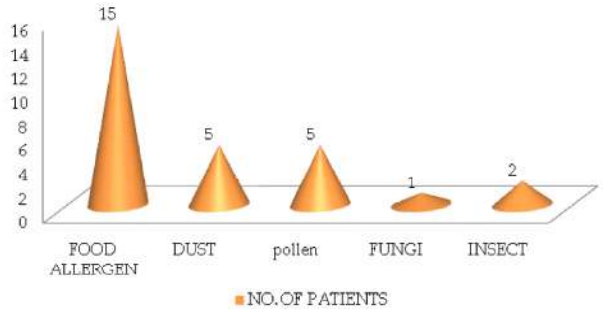

Fig. 5: Interpretation of prick test in study

Out of 28 patients 20 patients showed reduced frequency, severity and requirement of antihistamines after avoidance of positive allergen. Remaining cases partial recovery was noted. It was observed that all patients experienced quick relapse as they returned to their normal life and diet.

Discussion

Skin prick test is the most convenient and least expensive method of allergy testing and result can be made available within 15 - 20 minutes. Prick testing helps to trace out type 1 (immunoglobulin E) mediated hypersensitivity specifically [8,9]. Patients with idiopathic urticaria, who were willing and had a high degree of suspicion towards particular food items or aero allergens, and in whom all other clinical and laboratory findings were non contributory, underwent skin prick testing. Standardized extracts for many antigens are readily available. These tests are generally well tolerated with mild erythema and edema that usually subsides within one to two hours. More severe swelling is treated with oral antihistamines, topical steroids and ice-packs. It was possible to identify cause and eliminate it in 20 patients.

A positive skin test indicates that the subject is allergic to the particular substance. In general, skin tests are most reliable for diagnosing allergies to airborne substances, such as pollen, epithelia, and dust mites.

Diagnosing food allergies can be complex, and may need additional tests or procedures. In our study maximum number of patients reacted positively to yeast out of the food allergens but due to the small case numbers for prick test, no conclusion can be made. In pollen, maximum number of patients reacted positively to parthenium which is the most common aeroallergen in India.

Conclusion

Urticaria affects 15-25% of people at least once in their lifetime. It is more common in the younger age group with a female predominance. Skin prick test is found to be a simple, quick and inexpensive method for identifying the causative allergen in a majority of the patients. Skin prick test carries the minimum risk of anaphylaxis; hence, it can be performed routinely for CSU (chronic spontaneous urticaria) patients.

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Original Article

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A Clinical Study of Melasma and the Effect of Different Therapeutic Modalities in its Treatment

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Abstract

Context: Melasma is a common, acquired, symmetric hypermelanosis, characterized by irregular light to dark brown macules and patches commonly involving the cheeks, forehead, upper lip, nose, and chin. *Aims:* To study the clinical patterns of melasma in patients attending skin OPD and To study the effect of different therapeutic methods in treatment of melasma. *Settings and Design:* Prospective cohort. *Materials and methods:* Patients attending OPD were randomly divided into 3 equal groups to be treated with either topical hydroquinone or topical triple combination or chemical peeling. All patients were evaluated before treatment, followed up for 6 months, peel session done at an interval of 1 month and MASI score was calculated every time. *Statistical analysis:* Student t test *Results:* Among 150 patients studied, majority were in the age group of 20-30 yrs [38.7%], females [79%] and belonged to epidermal type [51.33%] of melasma based on woods lamp, centrofacial [74.7%] type of melasma based on clinical findings. There was improvement in the MASI score of all patients in all melasma type [both clinical and woods lamp] irrespective of treatment group and the difference seen was statistically significant in each group [$p<0.05$]. *Conclusion:* Triple combination showed better results compared to glycolic acid peels and hydoquinone with no significant side effects with short contact time. Considering the high prevalence of melasma among people with Indian skin type there is a need to study effect of various modalities of treatment used for the same.

Keywords: Melasma; Chemical Peeling; Hydroquinone; Triple Combination.

Introduction

Skin colour is an important visible sociocultural characteristic of an individual [1]. Hence, any deviation from the normal colour adversely affects the social and emotional well-being of the patient. Melasma is a common pigmentary disorder characterized by almost symmetrically distributed, brown macules with defined geographic border affecting the sun exposed areas [2]. The reported prevalence of melasma ranges from 8.8% among Latino females in the Southern United States to as high as 40% in Southeast Asian populations [3]. The exact incidence in India is not known [2]. An assortment of treatment modalities are available for melasma including topical hypopigmentary agents, chemical peels, lasers, dermabrasion but the response is not overwhelming. Though melasma does not cause any health related problems it has a severe impact on the quality of life. This prompted us to study the clinical patterns of melasma and also to evaluate the effect of various modalities of treatment used for the same.

Subjects and Methods

Patients with melasma who visited the Out Patient Department over the period of one year and had not received any prior treatment were enrolled for the study after ethical clearance. Pregnant ladies, patients on treatment for melasma, patients with known history of allergies to any of topical medication, patients with unrealistic expectations were excluded from study. After obtaining an informed written consent detailed history was taken and clinical examination of all patients was done. All patients were examined under Wood's lamp and were classified into epidermal, dermal, mixed

melasma. The MASI (Melasma Area And Severity Index) score was calculated and color photographs were taken of all patients under standard conditions in natural light [4]. Patients were then randomly divided into 3 groups of 50 each. Group A patients were treated with glycolic acid peels, group B were treated with topical 4% hydroquinone and group C patients were treated with triple combination of hydroquinone 2% + tretinoin 0.025% + momentasone 0.1%. All patients were given sunscreens for daily application after treatment. In group A peeling was done with glycolic acid (GA) peel. 70% glycolic acid was diluted to 20% and 35%. After degreasing, treatment with GA peel was carried out for a period of 20-30 seconds and was left for a definite period of time (first peel: 20% GA for 2 minutes; second peel: 20% GA for 5 minutes; third peel: 35% GA for 2 minutes; fourth peel: 35% GA for 3 minutes; fifth peel: 35% GA for 5 min, separated by 1 month interval) on the individual anatomic units, separately and in a preset sequence. If patient complained of pain or burning sensation peel was terminated early. Peel was terminated by using a neutralizer. Post peel patients were advised to apply sunscreen topically daily every 2 hrs. Patients in group B were given hydroquinone 4% to be applied in the night. The remaining 50 patients were treated with triple combination of 0.025% tretinoin and 0.1% momentasone and 2% hydroquinone for short period (upto 30 min). Melasma severity was scored at baseline, and at each peel session using the Melasma Area and Severity Index (MASI) at an interval of 1 month [4]. The face was divided into four areas: forehead, right malar, left malar, and chin that correspond respectively to 30%, 30%, 30%, and 10% of total face area. The melasma in each of these areas was graded on three variables: percentage of total area involved on a scale from 0 (no involvement) to 6 (90% to 100% involvement); darkness on a scale from 0 (absent) to 4 (severe); homogeneity on a scale of 0 (minimal) to 4 (maximum). The MASI was then calculated by the following equation:

MASI=0.3 (DF+HF) AF+0.3 (DMR+HMR) AMR+0.3(DML + HML) AML + 0.1 (DC + HC) AC where D is darkness, H is homogeneity, A is area, F is forehead, MR is right malar, ML is left malar, C is chin, and the values 0.3, 0.3, 0.3, and 0.1 = respective percentages of total facial area. This grading for each patient was done clinically at every visit.

Statistics

Data collected was imported into Microsoft Excel 2007. Data was analyzed using IBM SPSS 20.0. Student t test was applied.

Results

The study comprised of 119 females and 31 males in the age group of 20 – 70 yrs with a mean age of 34.78 years. Majority had Fitzpatrick's type IV (76%) and V skin (17.33%), and very few had Fitzpatrick's type III skin (6.67%). All the three groups were comparable with no statistically significant difference in the age distribution, skin type, duration of melasma and pattern of melasma. Majority of our patients had epidermal type (51.33%) and mixed (48%) melasma. Only one patient (0.67%) had dermal melasma. Centrofacial melasma was the most common type (74.7%), followed by malar type (25.3%) of melasma. None of the patients had mandibular pattern of melasma. The mean MASI reduction in patients was 50%, 39%, and 66% in groups A, B and C respectively. In all three groups the reduction in MASI was statistically significant. Triple combination showed significantly better results compared to peel and hydroquinone (Figure 1,2,3). The mean MASI

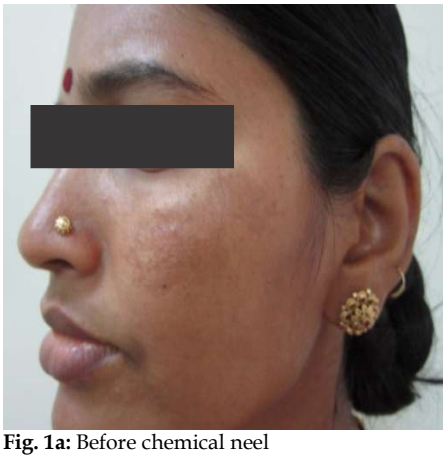

Fig. 1a: Before chemical neel

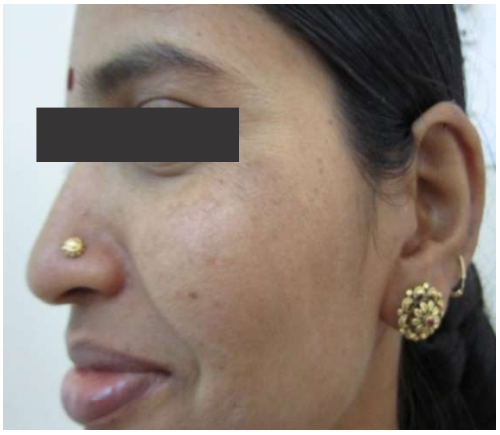

Fig. 1b: After chemical neel

Fig. 1: Pre and post treatment photograph with chemical peeling

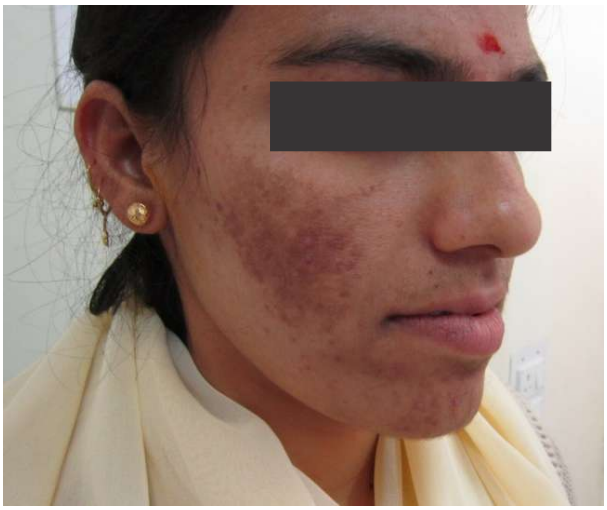

Fig. 2a: Before Hydroquinone

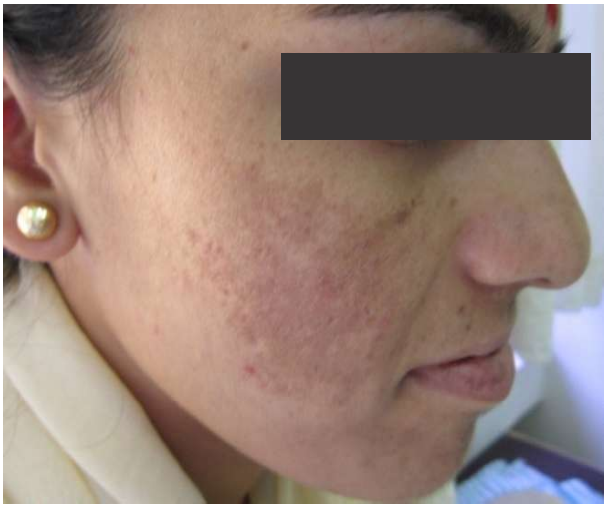

Fig. 2b: After hydroquinone

Fig. 2: Pre and post treatment photograph with hydroquinone

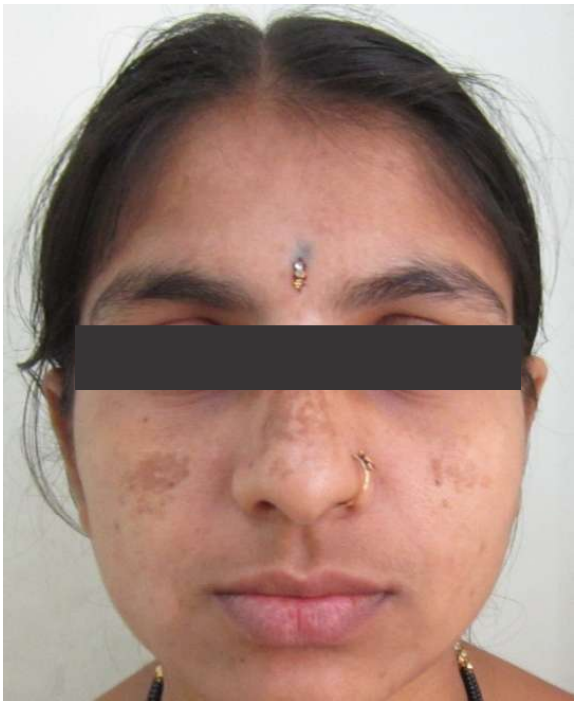

Fig. 3a: Before Triple Combination

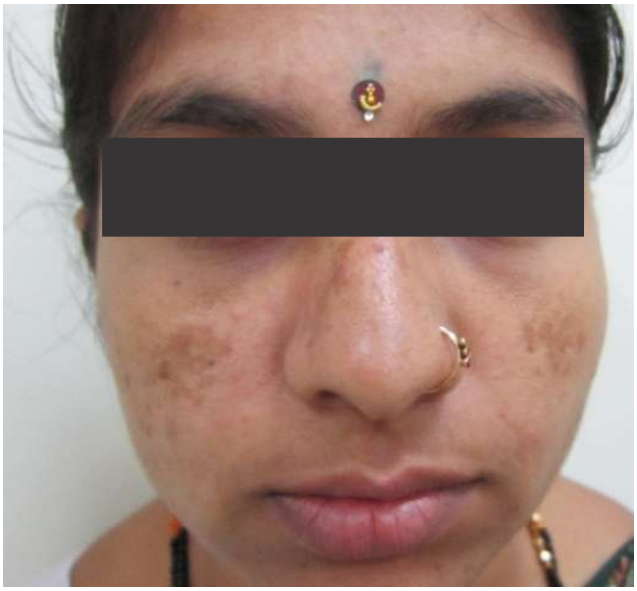

Fig. 3b: After Triple Combination

Fig. 3: Pre and post treatment photograph with triple combination

reduction in patients with epidermal melasma was 51%, 40%, 62% in group A,B,C respectively. The difference in the reduction of mean MASI scores of epidermal melasma in the three groups was, however, not statistically significant. (Table 1) Difference in reduction in MASI score between the three treatment modalities was not significant. On the other hand in patients with mixed melasma triple combination and glycolic acid showed significantly better results compared to hydroquinone. Only 1 patient belonged to dermal melasma group and showed 30% reduction in MASI score. The reduction in MASI in different types of clinical melasma is given in Table 2. In centrofacial and malar group triple combination gave significantly better results compared to hydroquinone. The percentage reduction of the mean MASI score in different skin types is given in Table 3. The difference in reduction in MASI score between all the three groups was not significant in people with skin type 3 and 5. In skin type 4 patients treated with triple combination showed better results.

No complications were observed in patients who received hydroquinone. Only 5 (10%) patient treated with triple combination cream experienced slight burning sensation. In chemical peeling group, 1 (5%) patient developed post peel burns. None of the patients suffered worsening of melasma on treatment.

Table 1: Percentage improvement in different types of melasma

	MASI1		MASI 5		n	% improvement	p value
Epidermal	Mean	SD	Mean	SD			
Group a	14.81	11.38	7.259	5.45	27	51%	<0.05
Group b	9.725	5.018	5.877	4.71	23	40%	<0.05
Group c	12.78	4.698	4.891	3.61	23	62%	<0.05
Dermal							
Group c	9.9	0	6.9	0	1		
Mixed							
Group a	10.00	4.299	5.208	3.05	23	48%	<0.05
Group b	13.23	5.407	7.956	4.59	23	40%	<0.05
Group c	12.40	9.077	3.584	4.46	26	71%	<0.05

Table 2: Percentage improvement in different treatment groups in different clinical types of melasma

	MASI 1		**MASI 5**		**n**	**improvement**	**p value**
cf	**Mean**	**SD**	**Mean**	**SD**			
Group a	12.8	9.373	6.4	4.63	39	49%	<0.05
Group b	11.69	6.06	6.93	5.179	32	41%	<0.05
Group c	12.42	7.304	4.468	4.226	41	64%	<0.05
Malar							
Group a	11.75	8.447	5.790	4.602	11	51%	>0.05
Group b	10.71	4.199	6.65	3.950	18	38%	<0.05
Group c	13	7.224	3.266	3.315	9	75%	<0.05

Table 3: Descriptive statistics: Reduction in MASI score in fitzpatrick skin types 3,4,5.

	n	**MASI 1**		**MASI 5**		**% improvement**	**p [1 and 5]**
		mean	**SD**	**mean**	**SD**		
A-3	6	12.27	7	7.05	4.16	42.54%	Not significant
A-4	37	13.53	9.92	6.51	4.91	51.88%	significant
A-5	7	7.97	3.89	4.67	2.97	41.41%	Not significant
B-3	19	10.47	5.46	6.69	4.86	36.10%	significant
B-4	30	11.91	5.54	7	4.79	41.23%	significant
B-5	1	10.8	0	4.5	0	58.33%	Not significant
C-3	10	14.7	9.07	6.63	5.28	54.90%	significant
C-4	37	12.04	6.58	3.53	3.44	70.68%	significant
C-5	3	11.4	9.9	5.2	5.4	54.39%	Not significant

Table 4: Comparison of our study with other studies using hydroquinone

	Solis JN et al. [17]	**Iraji F et al. [18]**	**Rochelle et al. [19]**	**Present study**
No of cases	27 cases	72	30	50 cases
Interval and %hydroquinone	8 weeks 4% hq	6 months 4% hq	12 weeks 4% hq	6 months 4% hq
Reduction in MASI	70%	48.8%	72.2%	39%

Table 5: Comparison of our study with other studies using GA peel

	Rashmi kumari et al. [9]	**Javaheri et al. [22]**	**Sarkar et al. [21]**	**Kar et al. [8]**	**Present study**
%GA and interval	20-35% and 2 weeks	50% 4 weeks	30-40% 3 weeks	35-70% 2 weeks	20-35% 4 weeks
No of caseses and avg no of peel	20 cases 7 peels	23 cases 3 peels	20 cases 6 peels	25 cases 6 peels	50 cases 5 peels
Reduction in MASI	79%	47%	46%	40.44%	50%

Discussion

Melasma is a pigmentary disorder more common in women than in men and occurs most commonly in women of reproductive age. It is found most commonly in women with Fitzpatrick skin phototypes III – V especially in people of East and South-East Asian and Hispanic origin living in areas of intense ultraviolet (UV) light exposure [3,5]. Majority of the patients in our study were in the age group 20-30 years (58 patients), followed closely by 31-40 yrs (57 patients). This was in agreement with other Indian studies [6,7,8]. The mean age of the patients in our study was 34.78 years. In a study by Kumari R. et al. [9] the average age of patients at the onset of melasma was middle age, but Kimbrough-Green et al. [4] reported a much higher age of onset (44 years) in their study of Black patients, whereas in another study in Grifffiths et al. the age group was comparable with mean of 30 years [10]. Among the 150 patients included in our study 119 were females and 31 were males. The ratio was 1:3.83. This was in agreement with other Indian studies [7,8,9] and a study done in Western Nepal by Dwari BC et al. [11] The most common pattern of melasma was centrofacial (74.7%) followed by malar pattern (25.3%). This was in agreement with the study by Bansal C et al. [6] and in contrast to studies by Kumari R et al. [9] and Grover et al. [12]. None of the studies reported mandibular type of melasma except a study by Kar et al. [8] which reported 11.6% mandibular pattern. On woods lamp examination, epidermal melasma more common. This was in corroboration with study by Kar et al. [8], Rashmi et al. [9], Sanchez et al. [13] and in contrast with study of Bansal C et al. [6] where mixed was more common. Patients included in our study belonged mainly to skin type 3, 4, 5. Most of our patient belonged to skin type 4 (76%), others belonged to type 5 (17.33%) and type 3 (6.67%). This was in agreement with other studies done in India [6,8]. In the present study 42 patients (28%) had a family history of melasma whereas in study by Bansal et al [6] 55% patients had family history.

A variety of treatment modalities have been tried in melasma including topical hypopigmentary creams, peels and lasers. We studied the response of melasma patients to hydroquinone, triple combination and glycolic acid peels. Hydroquinone is one of the earliest compounds used for the treatment of hyperpigmentation. Its mechanisms of action are inhibition of tyrosinase, inhibition of DNA and RNA synthesis, degradation of melanosomes and destruction of melanocytes. It is commonly used at concentrations ranging from 2% to 5% [14,15]. The most frequently observed reactions are mild skin irritation and sensitization, while chronic use is said to cause exogenous ochronosis [16]. In our study the reduction of MASI score after 5 months was 39% with hydroquinone. This was lesser compared to other studies. In a double blind split face randomized clinical trial of niacinamide versus 4% hydroquinone carried out on 27 patients in Mexico by Solis JN et al. showed average decrease in MASI at the end of 8 weeks for hydroquinone was 70% [17]. In another study conducted on 72 women in Iran by Iraji F et al. comparing 10% zinc sulphonate and 4% hydroquinone in treatment of melasma, the average decrease in MASI at the end of 6 months follow up was 48.8% [18]. In a study by Rochelle et al. where they compared the efficacy of 0.75% KA and 4% hydroquinone, in patients who received 4% HQ average decrease in MASI at the end of 12 weeks was 72.2% [19]. The improvement seen in the present study was lesser compared to other studies. This could be explained by the reduced compliance with sunscreen usage in our set up.

Kligman's formula is one of the most popular combination therapies in the management of melasma. This original formula used dexamethasone 0.1% in combination with 0.1% tretinoin, and 5% hydroquinone [20]. It has been modified in a number of ways over the years to suit different skin types. We used a combination of 0.025% tretinoin, 0.1% momentasone and 2% hydroquinone. Sarkar et al. [21] had compared the efficacy of 20% GA with Kligman's formula in 20 cases of epidermal melasma and had seen a significant reduction (>80%) in MASI scores with GA when compared to plain Kligman's regime. In total contrast to the above study in our study the percentage improvement with triple combination (66%) was more than with GA (50%) and the difference was statistically significant.

Glycolic acid, an alpha hydroxy acid is most commonly used for chemical peeling. It causes a decrease in corneocyte adhesion and epidermolysis [9]. We used glycolic acid in concentrations of 20 and 35%. In our study, results were statistically significant with glycolic acid peel. The average improvement of 50% in mean MASI score was obtained. Many other studies [8,9,21,22] that have used GA in various concentrations in similar skin type patients have shown variable results. In a study done by Kar et al. [8] where they compared the efficacy of low fluence laser, high fluence laser with glycolic acid peels in treatment of melasma the results with six sessions of peel

with glycolic acid were statistically significant. There was an improvement of 40.44% in the mean MASI score. Grover and Reddu [12] had in their experience with GA (10-30%) in various cases showed response, above 60% in more than 90% of cases. Sarkar et al. [21] had compared the efficacy of 20% GA with Kligman's formula in 20 cases of epidermal melasma and had seen a significant reduction (>80%) in MASI scores with GA when compared to plain Kligman's regimen (Table 5).

Complications

No complications were observed in patients who received hydroquinone. Only 5 (10%) patient treated with triple combination cream experienced slight burning sensation. In a study by Taylor SC [23] erythema and desquamation occurred in about half of treated patients. The reduced incidence of side effects in our study could be attributed to the short contact time. (5 min – 30 min). In chemical peeling group, 1 (5%) patient developed post peel burns. In a study by Kar H K et al. [8], 4% patients showed immediate burning and erythema and 1% showed post inflammatory hyperpigmentation.

Conclusion

Treatment of melasma has eluded dermatologists for years. No treatment guarantees full recovery. In our study triple combination showed better results compared to glycolic acid peels and hydoquinone with no significant side effects with short contact time. In all three groups the reduction in MASI was statistically significant.Considering the psychologic and social impact melasma has on the patient, additional research in developing new and effective treatments for melasma is required.

Limitations

Follow up after 5 sitting was not done so recurrence rate could not be assessed.

Key messages

Melasma is an acquired pigmentary disorder wherein numerous treatment modalities have been tried with no one modality being superior. So this is an attempt to find the better treatment among commonly used modalities.

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Original Article

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Dermatophytosis: Correlation Between the Site of Involvement and the Causative Agent

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Abstract

India is a large sub continent with remarkably varied topography, situated within the tropical and subtropical belts of the world. Its climate is conducive to the acquisition and maintenance of fungal infections. They are assuming greater significance both in developed and developing countries particularly due to advent of immunosuppressive drugs (steroids) and due to the increased prevalence of diseases like HIV. A total of one hundred and fifty clinically diagnosed randomly selected cases of skin, hair and nail infection, of all age groups and of both sexes, attending Dermatology out patient department were taken for the study. Out of 150 clinically suspected cases of dermatophytosis, fungi were demonstrated in 140 cases (93.33%) either by direct microscopy and/or culture. Eighty-five cases (58.67%) were positive by both microscopy and culture. Thirty-eight (25.33%) were positive by microscopy and negative by culture. Fourteen cases (9.34%) were negative by microscopy but culture positive. Ten cases (6.67%) were negative both by microscopy and culture.

Keywords: Dermatophytosis; Fungal Infections; KOH.

Introduction

Dermatophytoses are the infections of keratinized structures such as the epidermis, hair, and nails, caused by a group of closely linked filamentous fungi known as dermatophytes [1]. Superficial fungal infections have been reported world wide as being one of the most common infectious diseases in clinical practice. Regardless of the rapeutic advances in the last decades, the occurence of cutaneous mycosesiss till increasing [2]. Depending on their origin of living, dermatophytes are described as anthropophilic (human), zoophilic (animal) orgeophilic (soil). Anthropophilic dermatophytes are the most frequent sources of tinea infections [3].

The classical clinical presentation of tinea infection, is an annular lesion with central clearing surrounded by an advancing, red, scaly elevated border. Inflammation assists in colonization and may result in vesicles on the border of the affected area. Atopic persons and those with zoophilic fungi infection tend to have more intense inflammation [3].

India is a large subcontinent with remarkably varied topography, situated within the tropical and sub-tropical belts of the world. Its climate is conducive to the acquisition and maintenance of fungal infections [4]. They are assuming greater significance both in developed and developing countries particularly due to advent of immunosuppressive drugs (steroids) and due to the increased prevalence of diseases like HIV [5].

In India, cases of superficial fungal infections were first reported from upper Assam by Dr. Powell in 1900 AD. Since then various studies have been conducted from different regions of the country [6]. The clinical presentation, though very typical of ring worm infection, is very of ten confused with other skin diseases, making laboratory diagnosis and its confirmation necessary [7].

Accurate assessment of the prevalence and etiological agent is required to estimate the size of disease problem and to prevent the transmission and spread of such infections with adequate measures [8].

Methodology

The present study of dermatophytosis was carried out in the department of Dermatology.

A total of one hundred and fifty clinically diagnosed randomly selected cases of skin, hair and nail infection, of all age groups and of both sexes, attending Dermatology out patient department were taken for the study.

The selected cases were studied as per the proforma enclosed. A detailed history of selected cases was taken in relation to name, age, sex, address, occupation, duration of illness and involvement of more than one site.

After the detailed history, clinical examination of patient was made in good light which included site of lesion, number of lesions, types, presence of inflammatory margin and extent of involvement.

Specimen Collection

The affected area was cleaned with 70% ethyl alcohol, skin scales, crusts and pieces of nail or hairs were collected in clean white paper packets.

Skin specimen was collected by scraping across the inflamed margin of lesion into the apparently healthy tissue.

Nail specimen was collected by taking clippings of the infected part and scrapings beneath the nail.

Hair specimen was collected by plucking with epilating forceps along with the base of the hair shaft around the follicle.

Direct Microscopic Examination

Specimen collected was subjected to potassium-hydroxide (KOH) wet preparation of various concentrations (10%, 20% and 40%) depending on the type of clinical specimen for the presence of fungal elements. The fungal elements appearas highly refractile, hyaline septate branching filaments.

Culture

For primary isolation Sabouraud's dextrose agar with 0.5% Chloramphenicol and 0.05% Cycloheximide slopes were used and Dermatophyte test media was used as a selective media.

Slide culture was done to study the micromorphology of microconidia and macroconidia, nature of the sporulation, special structures such as spirals, pectinate, racquet hyphae, and chlamydospores.

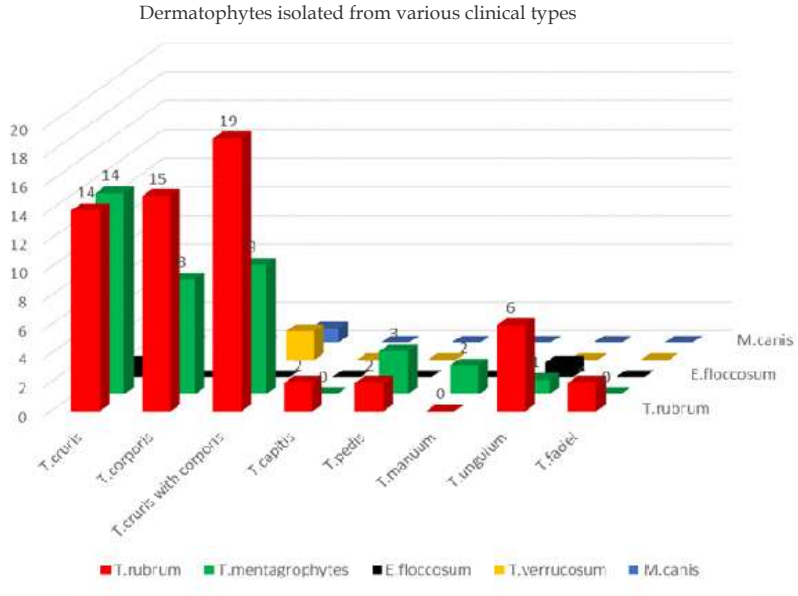
Special tests were performed when necessary, viz, hair perforation test and biochemical test like urease test was done for species identification.

Results

Table 1: Dermatophytes Isolated from the Study Group

Sl. No.	Dermatophyte species	No.	Percentage
1	*T. rubrum*	60	58.82
2	*T. mentagrophytes*	37	36.27
3	*E. floccosum*	2	1.96
4	*T. verrucosum*	2	1.96
5	*M. canis*	1	0.98
	Total	73	100

Out of the total 150 cases, isolation rate was 102 (68%). *T. rubrum* was the commonest species isolated 60 (58.82%) followed by *T. mentagrophytes* 37 (36.27%), *E. floccosum* 2 (1.96%), *T. verrucosum* 2 (1.96%) and *M. canis* 1 (0.98%) (Table 1).



Graph 1: Dermatophytes Isolated from Various Clinical Types

In Tinea cruris, out of 42 cases, *T. rubrum* and *T. mentagrophytes* were the commonest species isolated 14 (33.33%) each followed by one case of *E. floccosum* (2.3%).

In tinea corporis, out of 37 cases, *T. rubrum* was the commonest species isolated 15 (40.54%) followed by *T. mentagrophytes* 8 (21.62%).

In tinea cruris with corporis, out of 36 cases, *T. rubrum* was the commonest species isolated 19 (52.78%) followed by *T. mentagrophytes* 9 (2.5%), *T. verrucosum* 2 (5.5%) and *M. canis* 1 (2.78%).

In tinea capitis, out of 7 cases, only in two cases organisms were isolated and both were positive for *T. rubrum* (28.57%)

In tinea pedis, out of 8 cases, *T. mentagrophytes* was the commonest species isolated 3 (37.5%) followed by *T. rubrum* 2 (25%).

In tinea manuum, out of 4 cases, only 2 cases showed culture positivity and both were of *T. mentagrophytes* (50%).

In tinea unguium, out of 13 cases, *T. rubrum* was the commonest species isolated with 6 (46.15%) isolates and one each case of *T. mentagrophyte* and *E. floccosum* (7.69%).

In tinea faciei, out of 3 cases, *T. rubrum* was the only species isolated 2 (66.67%) (Graph 1).

Out of 150 clinically suspected cases of dermatophytosis, fungi were demonstrated in 140 cases (93.33%) either by direct microscopy and/ or culture. Eighty-five cases (58.67%) were positive by both microscopy and culture. Thirty-eight (25.33%) were positive by microscopy and negative by culture. Fourteen cases (9.34%) were negative by microscopy but culture positive. Ten cases (6.67%) were negative both by microscopy and culture (Table 2).

Out of 42 cases of tinea cruris, all were KOH positive (100%) and 29 cases showed culture positivity (69.04%). Having 69% culture positivity rate, this is the second most common site for dermatophyte isolation.

Out of 37 cases of tinea corporis, 35 cases (94.59%) KOH showed positivity and 23 cases (62.16%) showed culture positivity.

Out of 36 cases of tinea cruris with corporis, all 36 (100%) showed KOH positivity and 31 cases (86.11%) were culture positivity which is the highest among other clinical types.

Out of 7 cases of tinea capitis, none of the cases were KOH positive and only 2 cases were culture positive.

Out of 8 cases of tinea pedis, 4 cases (50%) were KOH positive and 5 cases (62.5%) were culture positive.

Among 4 cases of tinea manuum, only one case (25%) showed KOH positivity, and 2 cases (50%) showed culture positivity.

Of total of 13 cases of tinea unguium, only 6 cases (46.15%) were KOH positive and 8 cases (61.54%) were culture positive. Here culture positivity was better than KOH positivity similar to tinea pedis.

Of the 3 cases of T. faciei, 2 were KOH positive (66.67%) and 2 were culture positive (66.67%) (Table 3).

Table 2: KOH & Culture Findings

	Total KOHand/ or culture +ve	KOH +ve Culture +ve	KOH +ve Culture -ve	KOH –ve Culture+ve	KOH –ve Culture – ve
Number of cases	140	88	38	14	10
Percentage	93.33%	58.67%	25.33%	9.34%	6.67%

Table 3: Corelation of KOH & Culture with Clinical Diagnosis

Clinical Type	Total no of cases	No of cases positive by KOH	No of cases positive by Culture
T. *cruris*	42	42(100%)	29(69.04%)
T. *corporis*	37	35(94.5%)	23(62.16%)
T. *cruris with corporis*	36	36(100%)	31(86.11%)
T. *capitis*	7	0	2(28.57%)
T. *pedis*	8	4(50%)	5(62.5%)
T. *manuum*	4	1(25%)	2(50%)
T. *unguium*	13	6(46.15%)	8(61.54%)
T. *faciei*	3	2(66.67%)	2(66.67%)

Discussion

In the present study, out of 150 clinically diagnosed cases of dermatophytosis, 140 cases (93.33%)were positive for fungi, either by KOH and/or culture. Eighty eight cases (58.67%) were positive by both KOH and culture, 38 cases (25.33%) were positive by KOH and negative by culture, 14 cases (9.34%) were negative by KOH but culture positive and 10 cases (6.67%) were negative by both KOH and culture. These findings are comparable with other studies done by Sumana V. et al., Karmakar S. et al., Singh S. et al. and Bindu V.

This variation could be due to non-viability of fungal elements in some cases.

In the present study, *T. rubrum* 60 (58.82%) was the commone staetio logical agent in majority of clinical types followed by *T. mentagrophytes* 37 (36.27%), which is comparable to other studies done by Bindu V. et al., Ranga nathan S. et al., Singh S et al. and Jain N et al.

E. flocossum and *T. verrucosum* was the third etiological agent of dermatophytosis to be isolated in 1.96% cases, which is similar to previous studies by Bindu V., Sahai S. et al. and Kannan P et al.

Intineaunguium, *T. rubrum* (46.15%) was the most common isolate followed by *T. mentagrophytes* (7.69%) and *E. floccosum* (7.69%).

The most frequent etiological agent of tinea unguium (80-90%) are *T. rubrum* and *T. mentagrophytes*. Mathur M. et al. reported equalisolation rates of 11.1% for both *T. rubrum* and *T. mentagrophytes*, whereas Veer P. et al. reported *T. rubrum* 57.64%, followed by *T. mentagrophytes* (42.3%) from cases of onychomycosis.

Conclusion

Dermatophyte infections are very common in our country where hot and humid climate in association with poor hygienic conditions play an important role in the growth of these fungi along with other factors like immunosuppression, occupational trauma and corticosteroid use. There is varying difference in isolation of differents pecies from southern and northern part of India. By and large Trichophyton species forms the commonest etiological agent of dermatophytosis.

Male preponderance was seen in all clinical types except T. *unguium* which could be due to increased outdoor physical activities and increased opportunity for exposure to infection than females.

Table 4: Comparison of KOH & Culture Findings with Other Studies (in percentage)

Author name, year andplace	Total KOH and/ or culture +ve	KOH +ve Culture +ve	KOH +ve Culture–ve	KOH–ve Culture +ve	KOH–ve Culture–ve
Huda MM. et al. [9]., 1995, Assam	92.85	57.14	1.19	34.52	7.15
Bindu V. et al. [10]. 2002, Calicut.	75.3	34	30	11.3	24.7
Singh S. et al. [3]. 2003, Gujarat	66.16	43.65	18.66	3.85	33.84
Karmakar S. et al. [11]., 1995, Rajasthan	88.40	39.2	46.8	2.4	11.6
Sumana V. et al. [12]., 2004, Khammam	70	45	14	11	30
Present study	93.33	58.67	25.33	9.34	6.67

Table 5: Dermatophytes Isolated in Various Studies

Name of the author, year and place	*T. rubrum*	*T. mentagrophyte*	*M. canis*	*T. tonsurans*	*E. floccosum*	*T. violaceum*	*T. verrucosum*
Bindu V. et al. [10], 2002, Calicut	66.2	25	-	5.9	2.9	-	-
Venkatesan G. et al. [13]., 2007, Chennai	73.3	19.7	2.8	-	4.2	-	-
Fathi HI. et al. [14]., 2000, Iraq	20.9	16.2	-	10.5	-	-	36.2
Karmakar S. et al. [11]., 1995, Rajasthan	42.3	-	-	-	-	55.7	-
Hanumanthappa H. et al. [2]., 2012, Mysore	58.9	24.6	-	5.4	0.7	-	-
Present study	58.82	36.27	0.98	-	1.96	-	1.96

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Original Article

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A Clinico-Epidemiological Study of Dermatophytosis

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Abstract

The source of infection is usually an active lesion on an animal, or on another humanand transmission is either by direct contact or indirect lyvia fomites. Fomites play an important rolein transmission, especially when combined with host risk factors such as immunological status, local trauma, excessive moisture or occlusive clothing. Use of contaminated combs, caps, towels, shoes, socks, pillows, beddings, and clothing include the common methods of indirect transmission. After the detailed history, clinical examination of patient was made in good light which included site of lesion, number of lesions, types, presence of inflammatory margin and extent of involvement. Most common clinical type being 42 cases (28%) in tinea cruris, then followed by 37 cases (24.67%) in tinea corporis, 36 cases (24%) in tinea cruris with corporis, 7 cases (4.67%) in tinea capitis, 8 cases (5.33%) in tinea pedis, 4 cases (2.67%) in tinea manuum, 13 cases (83.3%) in tinea unguium and 3 cases (2%) in tinea faciei. Middle class population was the most commonly affected socio-economic group compared to other studies which show low class. This may be due to the inability of the patients to reach to this hospital from far flung areas and poor patients may prefer home remedies.

Keywords: Tinea Cruris; Tinea Capitis; Dermatophytosis.

Introduction

Dermatophytes have been grouped into geophilic, zoophilic and anthropophilic species based on their ecology and host preference. Geophilic species are considered ancestral to pathogenic dermatophytes. The natural habitat of these species is the soil. These are only occasionally pathogenic for man and lower animals, with the exception of *M. gypseum*. Exposure to soil is the main source of infection. Ex: *M. gypseum, M. fulvum, T. terrestre* [1].

Zoophilic species, having developed the ability to hydrolyze keratinous debris in the soil, evolved to parasitize animals. Human infections are acquired either by direct contact with an infected animal or indirectly by contact with fomites. Ex: *M. canis, M. gallinae, M. equinum*, *T. mentagrophytes var mentagrophytes, T. verrucosum.*

Anthropophilic species have evolved from zoophilic species. Humans are normal hosts for these fungi and transmission may occur directly or indirectly. Ex: *E. floccosum, M. audouinii, T. mentagrophytes va rinterdigitale, T. rubrum, T. schoenleinii, T. tonsurans, T. violaceum* [2].

Distribution of the dermatophytes varies with the geographical area and during the course of time.Before 1900, in Western Europe tinea capitis was rare and was caused mostly by *M. canis*, from 1900 to mid 1950's a grey patch ectothrix type of ringworm in children caused by *M. audouinii* replaced *M. canis* dueto improved standard of living and spreadover the USA and Canada. This in turn is replaced by *T. tonsurans*. *T. tonsurans* and *M. canis* are now the most prevalent pathogens causing tinea capitis in North America and Europe, respectively [3].

In India, Africa and Nepal, T. *violaceum* is the main isolated fungus from children with tinea capitis. Tinea imbricate (Tokelau) caused by *T. concentricum* is geographically restricted to South Asia, China, India ('Indian or Chinese tinea'), the islands of south pacific, south and central America. The prevalence of dermatophytosis varies in India. Most of Indian studies indicate it is more prevalent in southern and eastern region than the northern regions of the country. In India the commonest species isolated are *T. rubrum* followed by *T. mentagrophytes* and *E. floccosum* [4].

The source of infection is usually an active lesion on an animal, or on another human and transmission is either by direct contact or indirectly via fomites. Fomites play an important role in transmission, especially when combined with host risk factors suchas immunological status, local trauma, excessive moisture or occlusive clothing. Use of contaminated combs, caps, towels, shoes, socks, pillows, beddings, and clothing include the common methods of indirect transmission. Infection from soil is a well-established if unusual occurrence as in case of *M. gypseum* [5].

In tinea pedis, institutions, hospitals and other modes of sharing washing facilities like showers, swimming pools, etc. play an important role in disease transmission.

Little is known about the factors that mediate adherence of dermatophytes. The kinetics of adherence to the skin or nail surface was investigated in several Trichophyton and Microsporum species, using different experimental models and microscopy techniques. These studies showed a time-dependent increase in the number of adhering spores, followed by germination and invasion of the stratum corneum by hyphae growing in multiple directions. Zurita and Hay observed that maximum adherence of Trichophyton spp. arthroconidia to keratinocytes in suspension occurred within 3–4 hours. Inanail platemodel, adherence and germination of T. *mentagrophytes* arthrospores were observed at 6 hours and side branches at 16 hours [6].

Dermatophytes are provided with an arsenal of proteases aimed at the digestion of the keratin network into assimilable oligopeptides oramino acids. These fungi secrete multiple serine and metallo-endoproteases (subtilisins and fungalysins, respectively) formerly called keratinases. Adirect relationship between keratinases and pathogenicity was established by Vianietal. They showed that, strains with the highest keratinolytic activities in vitro were responsible for the more symptomatic infections. It must finally be noted that skin damages upon dermatophytic infection can result from other processes than direct action of fungal lyticenzymes. Indeed, host proteases could possibly be activated and participate in inducing lesions.

Methodology

A total of one hundred and fifty clinically diagnosed randomlys elected cases of skin, hair and nail infection, of all age groups and of both sexes, attending Dermatology out patient department were taken for the study.

The selected cases were studied as per the proforma enclosed. A detailed history of selected cases was taken in relation to name, age, sex, address, occupation, duration of illness and involvement of more than one site.

After the detailed history, clinical examination of patient was made in good light which included site of lesion, number of lesions, types, presence of inflammatory margin and extent of involvement.

Inclusion Criteria

All skin, hair and nail samples from clinically suspected cases of dermatophytosis of all ages and both the sexes.

Exclusion Criteria

- Patients who are already using antifungal agents for the disease.
- Patients with those superficial fungal infections which are not caused by dermatophytes, such as tinea versicolor, etc.

Results

Table 1: Categorical Distribution of Clinical Samples

Samples Collected	No. of samples	Percentage (%)
Skin	130	86.67
Nail	13	8.67
Hair	7	4.67
Total	150	100

Out of the total 150 samples collected, 130 were skin scrapings, 13 were nail clippings and 7 were hair stubs (Table 1).

Table 2: Age Wise Distribution of Dermatophytoses in the Study Group

Age Group (Years)	No. of cases	Percentage (%)
<10	5	3.34
11-20	28	18.67
21-30	49	32.67
31-40	24	16
41-50	24	16
51-60	14	9.34
61-70	3	2
71>	3	2
Total	150	100

A total of 150 cases were distributed between the range of 2-78 years. Mean age was 32.61 years. Most common age group affected was 21-30 years with 49 cases (32.67%) followed by 11-20 years with 28 cases (18.67%) and 31-40 years and 41-50 years

with 16 cases each (16%). Least common age group affected was >70 years with 2 case (2%) followed by 0-10 years with 5 cases (3.34%) (Table 2).

Table 3: Distribution of Male & Female Patients Among Cases of Dermatophytosis

	Males	Females	Total	M:F Ratio
No. of cases	117	33	150	3.54:1
Percentage	78	22	100	

Out of 150 cases, males were more commonly affected with 117 cases (78%) than Females, who were 33 cases (22%). Male to female ratio was 3.54:1 (Table 3).

Most common clinical type being 42 cases (28%) in *Tinea cruris*, then followed by 37 cases (24.67%) in *Tinea corporis*, 36 cases (24%) in *Tinea cruris* with corporis, 7 cases (4.67%) in *Tinea capitis*, 8 cases (5.33%) in *Tinea pedis*, 4 cases (2.67%) in tinea manuum, 13 cases (83.3%) in *Tinea unguium* and 3 cases (2%) in *Tinea faciei*.

Most common age group affected was 21-30 years with 49 cases (32.67%) having *Tinea cruris* with corporis as the most common clinical type (28.57%), followed by *Tinea corporis* (26.53%) then T. *cruris* (24.49%).

Tinea cruris with 12 cases (42.86%) showed a high prevalence in the age group of 11-20 years.

Tinea capitis with 2 cases (4.08%), *Tinea faciei* with 2 cases (4.08%) and *Tinea unguium* with 5 case (10.2%) showed a high prevalence in the age group 21-30 years.

Tinea pedis with 4 cases (16.67%) showed a high prevalence in the age group 31-40 years [Graph 1].

Table 4: Socio-Economic Status of the Study Group

Socio-economic status	Number of cases	Percentage
Low income group	67	44.67%
Middle income group	76	50.67%
High income group	7	4.67%
Total	150	100

A total of one hundred and fifty clinically diagnosed patients of dermatophytosis were studied. Majority of the cases were from middle income group with 76 cases (50.67%) followed by low income group with 67 cases (44.67%) and high income group with 7 cases (4.67%) (Table 4).

Table 5: Occupational Status of the Study Group

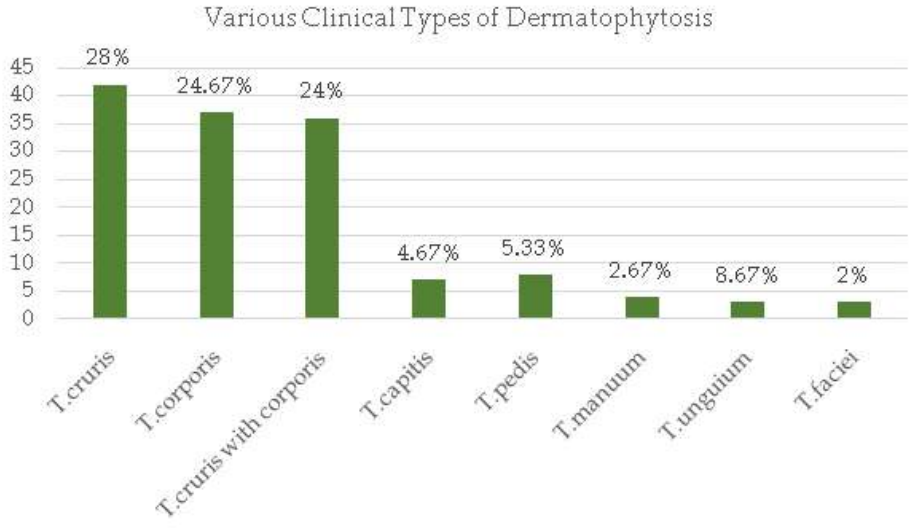
Occupation	No of cases	Percentage
Students	38	25.33
Manual workers	55	36.67
House-hold workers	19	12.67
Professionals	36	24
N/A(children)	2	1.33

Tinea cruris was most commonly seen in students with 15 cases (35.71%) followed by manual workers with 12 cases (28.57%).

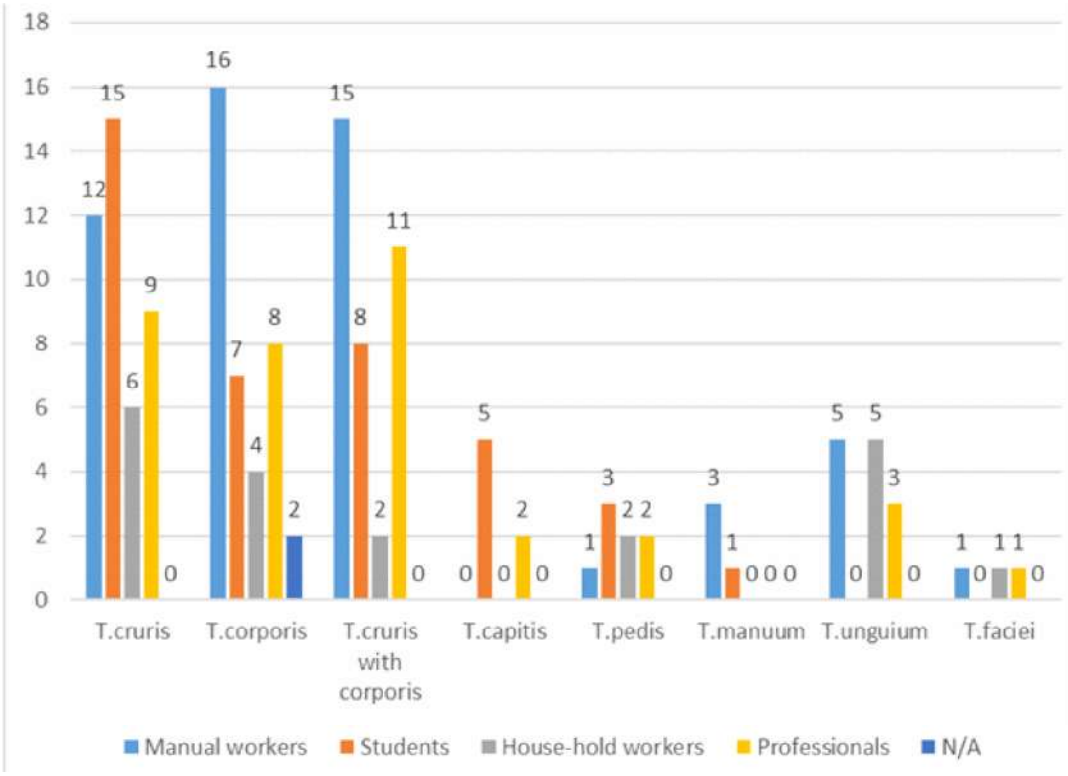
Tinea corporis was most commonly seen in manual workers with 16 cases (43.24%) followed by professionals with 8 cases (21.62%).

Tinea unguium was more commonly seen in manual workers and household workers with 5 cases (38.46%) each followed by Professionals with 3 cases (23.07%).

Tinea capitis was more commonly seen in school going children with 5 cases (71.42%) followed by in professionals in 2 cases (28.57%).



Graph 1: Incidence of Various Clinical Types



Graph 2: Various Clinical types in relation to occupation

Tinea pedis was more common in students 3 cases (37.5%), followed by household workers and professionals 2 cases each (25%).

One each cases of *Tinea faciei* were seen in manual workers, household workers and professionals (33.33%)

Three cases of *Tinea manuum* was seen in manual workers (75%) and one case (25%) with student.

Tineacorporis with *Tinea cruris* was common in manual workers with 15 cases (41.67%) followed by professionals with 11 cases (30.55%) (Table 5 and Graph 2).

Discussion

In this study, dermatophytosis was more common in the age group of 21-30 years (32.67%) followed by 11-20 years (18.67%), which is comparable with other studies done by Sen SS. et al., Sahai S. et al. and Peerapur BV. et al. whereas Veer P et al., Madhuri JT. et al., Jain N. et al. reported that the most common age group was 31-40 years. Singh S. et al. reported maximum cases in the age group of 16-30 years followed by 31-45 years.

Table 6: Age Distribution as Found in Various Studies (in percentage)

Name of the author, year and place	Commonest age group (percentage)
Bokhari MA. et al. [7]., 1999, Lahore	20-40 years (36%)
Madhuri JT. et al. [8]., 2002, Visakapatnam	21-40 years (59.8%)
Singh S. et al. [9]., 2003, Gujarat	16-30 yeas (31.36%)
Sen SS. et al. [10]., 2006, Guwahati	21-30 years (44%)
Veer P. et al. [11]., 2007, Aurangabad	31-40 years (39.4%)
Jain N. et al. [12], 2008, Jaipur	31-40 years (23.33%)
Sahai S. et al. [13], 2011, Lucknow	21-30 years (32.4%)
Present study	21-30 years (32.67%)

The higher incidence in adults aged 15-40 years could be due to greater physical activity with increased sweating and increased opportunity for exposure.

In the present study, males (78%) were more commonly affected than females (22%). Male to female ratio was 3.54:1, which is comparable with previous studies by Karmakar S. et al., Huda M. et al., Bindu V. et al., Sumana V. et al. and Sen SS. et al., whereas Bhokari MA. et al. and Madhuri JT. et al. reported that females were commonly affected than males, with male to female ratio being 1:2.6 and 1:1.08 respectively (Table 6).

Table 7: Sex Distribution In Earlier & Present Studies

Name of the author, year and place	Male to Female ratio
Karmakar S. et al. [14]., 1995, Rajasthan	2:1
Huda MM. et al. [15].,1995, Assam	1.86:1
Bokhari MA. et al. [7]., 1999, Lahore	1:2.6
Bindu V. et al. [16]., 2002, Calicut	2.06:1
Madhuri JT. et al. [8].,2002, Visakapatnam	1:1.08
Sumana V. et al. [17].,2004, Khammam	3:1
Sen SS. et al. [10]., 2006, Guwahati	2.85:1
Welsh O. et al. [18].,2006, Mexico	3.5:1
Present study	3.54:1

Male predominance could be due to increased outdoor physical activities and increased opportunity for exposure to infection than females.

In the present study, tineacruris was the commonest clinical type (28%) and commonest age group affected was 21-30 years (24.49%) and 11-20 years (42.86%) with 12 cases in each group. Males (83.33%) were more commonly affected. Above findings are comparable with previous studies done by Keyvanpakshi et al. and Karmarkar S. et al.

In the present study, *Tinea corporis* was the second most common clinical type encountered (24.67%) and the commonest age group affected was 21-30 years (26.53%). Males (78.37%) were predominantly affected than females (21.62%). These findings are comparable with study done by Karmarkar S. et al. and in contrast to other studies done by Bindu V. (54.6%), Singh S. et al., Sen SS. et al. (48%) and Jain Neetu (37%), where *T. corporis* forms the most common clinical type.

In the present study, *Tinea corporis* with *Tinea cruris* was present in 24% cases, which is comparable with the study of Peerapur BV Karmakar S (10.4% cases), whereas Siddappa K reported *Tinea corporis* with *Tinea cruris* in 0.77% cases.

In the present study, *Tinea capitis* was more commonly seen in the age group of 0-20 years (71.4%), which is comparable with other studies done by Siddappa K. (77.78%), Reddy BSN. (73.5%) and Kalla G. (85.5%). It was recorded that all the seven cases of *Tinea capitis* were seen in males. A higher incidence in females was reported by Reddy BSN. (60.3%), Jha NB.(65.2%) and Grover Chander (51.4%), whereas Kalla G. reported a higher incidence among males (M/F ratio: 1.8:1).

High occurrence of *Tinea capitis* in younger age groups may be due to lack of secretion of fungistatic sebum by scalp before puberty.

Female preponderance of *Tinea capitis* reported by several workers may be due to hormonal changes, closeness to children, more visits to hairdresser, whereas the reported higher incidence in males may be due to the custom of irregular application of vegetable oils over the scalp compared to the female counterparts, which has fungistatic properties.

In the present study, out of 150 cases, *Tinea pedis* was seen in 5.33% cases, which is comparable with the study done by Karmakar S. (2%) and Bindu V. (3.3%), whereas Huda MM. and Singh S. in their study on dermatophytosis, reported *Tinea pedis* in 7% and 11.53% cases respectively.

In the present study, out of 150 cases of dermatophytosis, *Tinea manuum* were 4 cases (2.67%), which is comparable with other studies done by Siddappa K.(1.53%) and Huda MM. (3%).

In the present study, *Tinea unguium* was more common in females. Male to female ratio was 1:1.2, which is in contrast with other studies done by Grover S and Vijaya D. et al., whereas Bhokari MA. and Madhuri JT. in their study reported that females were commonly affected than males, with male to female ratio being 1:2.6 and 1:1.08 respectively which are similar to present study.

In the present study, tineafaciei was seen in 2% cases, which is comparable with other studies done by Huda MM. (1% cases) and Singh S. (1.58% cases) whereas Karmakar S. has reported *Tinea faciei* in 6% cases.

In the present study, infection was most common in middle income group 50.67% followed by low income group 44.67% and high income group 4.67%. Similar findings were seen with Sarma S et al, Bindu V. and Agarwal US. et al. This was in contrast to the observations of Ranganathan S. et al. who reported that 69.2% of infected people were from low income group and 23.2% from middle income group.

The reason for this could be due to the inability of the patients to reach to this hospital from far flung areas or poor patients may prefer home remedies or the patients seek advice only for inflammatory type of dermatophyte lesions. And students from many nearby residential schools could be the probable reasons for the above findings.

In the present study, dermatophytosis was most commonly seen in manual workers 55 (36.67%), which included agricultural workers and manual labourers, followed by students 38 (25.33%), professional workers 36 (24%) which included professionals, service and business class workers, then house hold workers 19 (12.67%) which includes house wives, maids and service women and 2 cases (1.33%) of toddlers.

The above findings are comparable with the observations of Veer P. et al. and Sumana V. et al. This could be due to increased physical activity and opportunity for exposure in case of manual workers and increased wet work in case of housewives.

The incidence of dermatophytosis in this study was found to be maximum during the months, June to September (38.64%), followed by January to March (28.42%), which is similar to the findings of Kalla G. et al. and Sumana V. et al.

The higher incidence during monsoon, post-monsoon months could be due to increased humidity and moisture. Lower incidence in extreme summer and winter could be attributed to the dry, arid climate during this period of the year (Table 7).

Conclusion

Most commonly affected age groups were the second and third decades, which may be due to the bulk of students and manual workers in the study who are involved with physical activities, exposure to occupational trauma, long-hours of sitting and unhygienic behaviours.

The epidemiology of dermatophyte infections may change with time, and studies as the present one, provide knowledge on the present status of the diease in a particular geographic region.

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Pyoderma Gangrenosum: A Cause of Nonhealing Ulcer Over Lower Extremities

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Abstract

Chronic lower limb ulcer is a wound that shows no tendency to heal after 3 months of appropriate treatment or is still not fully healed at 12 months. There are various causes of non-healing ulcer which include vascular insufficiency, diabetic ulcer and various infections. One such cause is Pyoderma gangrenosum, which is a chronic, relapsing, ulcerative inflammatory neutrophilic dermatosis with distinctive clinical manifestations. It shows a strong association with systemic diseases like inflammatory bowel disease, seronegative arthritis and lymphoproliferative disorders. No specific investigations are available for the diagnosis which mainly depends on clinical features. Corticosteroids and immunosuppressant therapy are mainstays in treatment. Here, we present a case of pyoderma gangrenosum in a 55 year old female over lower limb, treated with cyclophosphamide pulse therapy and showed good improvement.

Keywords: Pyoderma Gangrenosum (Pg); Neutrophilic Dermatoses; Non Healing Ulcer.

Introduction

An ulcer is a breach in continuity of skin and mucous membrane. Chronic ulceration of lower limb is a frequent condition leading to pain and discomfort. Most common cause of lower limb ulcer is venous insufficiency in 70% cases followed by arterial in 10% mixed in 15% and others in 5% [1]. One such cause is Pyoderma Gangrenosum (PG). It is a neutrophilic, ulcerative inflammatory skin disease of uncertain etiology and is also known as phagedena geometrica, dermatitis gangrenosa, phagedenic pyoderma. It is frequently associated with systemic conditions and has incidence of 3 to 10 cases per million per year. PG can occur at any age, with peak incidence at age group of 20–50 years. Women are slightly more susceptible than men [2].

Case Report

A 55 year old female patient presented to skin outpatient department with 6 months old history of non healing ulcers over buttocks, perianal area, right knee and right ankle. H/o joint pain and swelling with morning stiffness involving large and small joints present. She was been treated with systemic steroids on & off for the same. Patient was a freshly diagnosed case of diabetes mellitus and hepatitis C Virus (HCV). On general examination, she was found to be emaciated and pale without any lymphadenopathy. She has excessive weight gain, buffalo hump, moon face, hypertrichosis and abdominal distention. On local examination ulcer of 5*5 cm in size with raised, undermined, boggy violaceous borders and necrotic slough at the periphery was present over lateral malleolus [Figure-1a]. Multiple ill defined undermined ulcers

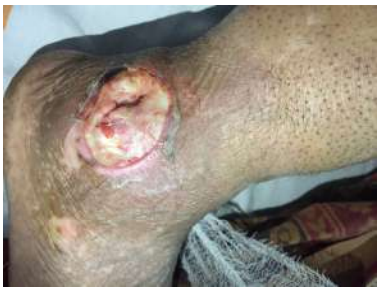

Fig. 1a: Ulcer of 5*5 cm in size with raised, undermined, boggy violaceous borders and necrotic slough at the periphery over lateral malleolus

ranging from 1*1 to 2*3 cm were present over both buttocks and perianal area with multiple scattered depigmented macules and patches [Figure -1b] Her baseline investigations, histogram, renal functions test, urine routine micro, serum electrolytes were in normal limits. Serology for HIV and syphilis were negative, RA factor was positive, Cryoglobulinemia and C-ANCA were negative, but P-ANCA was positive. C reactive protein, vitamin b12, ESR were deranged. Based on P-ANCA, HCV and clinical history of patient, pyoderma gangrenosum was suspected and biopsy was taken. Histopathology showed acanthosis, ulceration with neutrophilic debris in upper dermis. The rete ridges show saw toothing with marked histiocytic proliferation, perivascular lymphoplasmacytic infiltration and vascular proliferation which was suggestive of pyoderma gangrenosum. [Figure-2] Patient was started on cyclophosphamide pulse therapy as steroid sparing treatment. Five pulses of inj cyclophosphamide 750 mg IV was given to her under cover of MESNA (2-mercaptoethane sulfonate Na**)** and hydration at 21 days interval and she showed good improvement [Figure-3a and 3b]

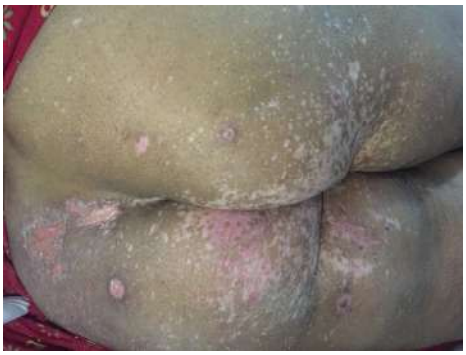

Fig. 1b: Multiple ill defined undermined ulcers ranging from 1*1 to 2*3 cm over both buttocks with multiple scattered depigmented macules and patches.

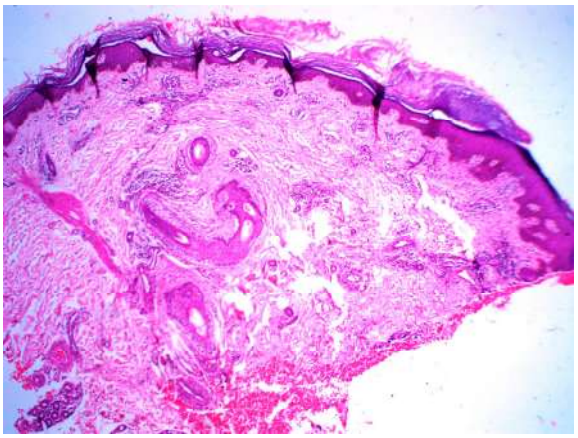

Fig. 2: Upper dermis showing acanthosis and ulceration with neutrophilic debris, saw toothing of rete ridges with marked histiocytic proliferation, perivascular lymphoplasmacytic infiltration and vascular proliferation.

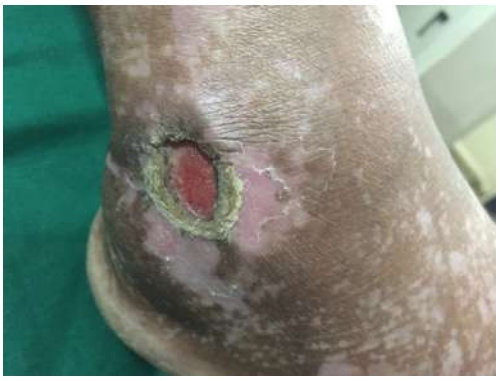

Fig. 3a:

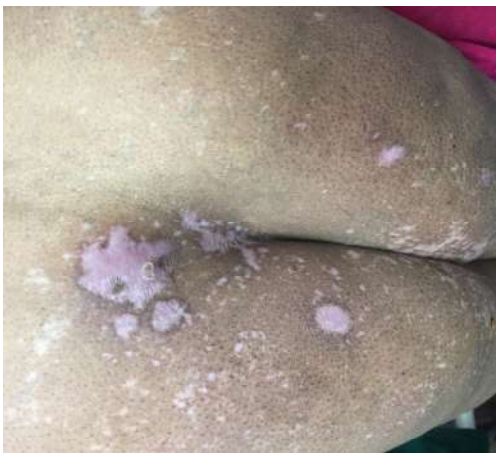

Fig. 3b:

Fig. 3a and 3b: Resolved lesions after treatment

Discussion

Chronic leg ulcer (CLU) is a wound that shows no tendency to heal after 3 months of appropriate treatment or is still not fully healed at 12 months [3]. There are multiple causes of chronic non healing ulcers. (Table 1)

Common sites for non-healing wounds are feet, ankles, and calves but for the non-ambulatory, common places include hips, thighs and buttocks. Pyoderma gangrenosum is also a chronic ulcerative condition, which should be kept as one of the differentials in lower limb nonhealing ulcer. In 50% to 70% cases, PG is associated with systemic diseases like inflammatory bowel diseases (ulcerative colitis and Crohn's disease), rheumatoid arthritis, multiple myeloma, leukemia, chronic active hepatitis, Behcet's disease, malignancies, HIV infection and immunosuppression in transplant recipients [4]. Its aetiopathogenesis is not completely understood. Possible causes include: an abnormal immunological response to undefined triggers, cross-reactivity, T cell-dysregulation, elevated pro-inflammatory

Table 1: Various causes of non healing lower limb ulcers.

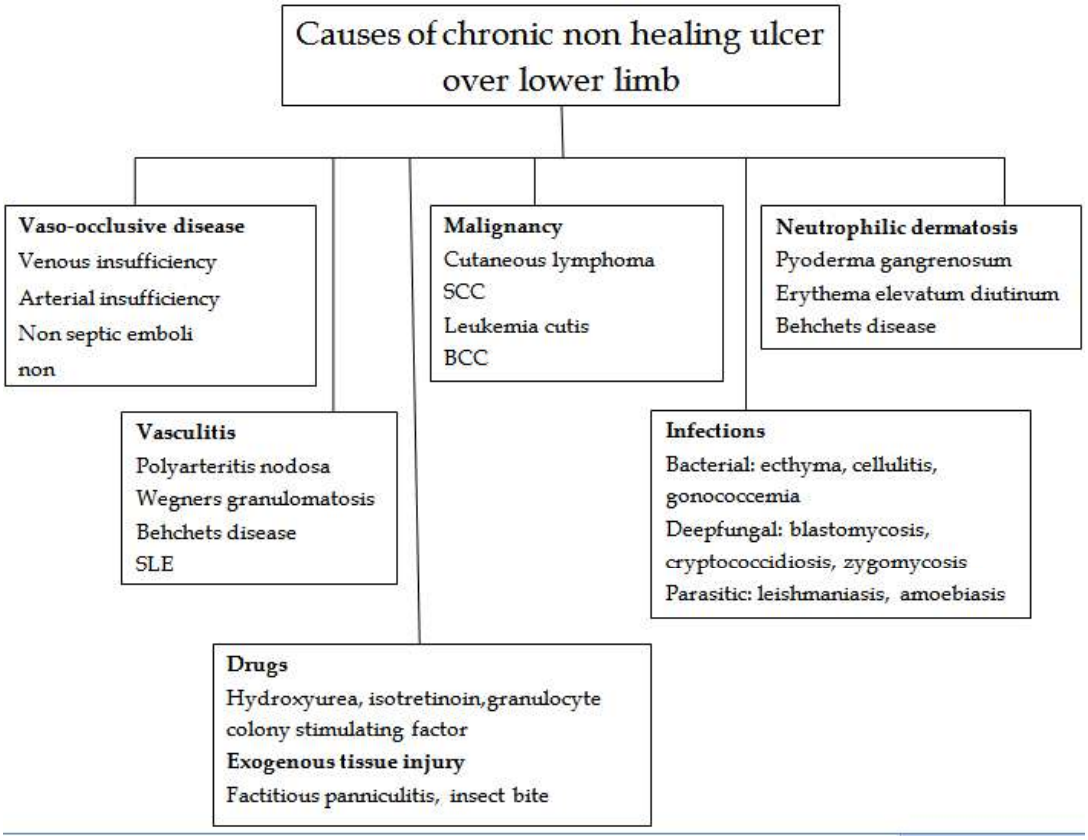

Table 2: Newer Diagnostic criteria for pyoderma gangrenosum

Major Criteria	A biopsy from the ulcer edge demonstrating a neutrophilic infiltrate
Minor Criteria	➢ Exclusion of infection ➢ Pathergy ➢ Personal history of inflammatory bowel disease or inflammatory arthritis ➢ History of papule, pustule, or vesicle that rapidly ulcerated ➢ Peripheral erythema, undermining border, and tenderness at site of ulceration ➢ Multiple ulcerations (at least one occurring on an anterior lower leg) ➢ Cribriform or "wrinkled paper" scar(s) at sites of healed ulcers ➢ Decrease in ulcer size within one month of initiating immunosuppressive medications

cytokines and chemokines or genetic abnormality which is supported by the presence of PG lesions in patients with: PAPA syndrome (pyogenic sterile arthritis, PG, and acne); PAPASH syndrome (pyogenic sterile arthritis, PG, acne, and hidradenitis suppurativa) and PASH syndrome (PG, acne, and hidradenitis suppurativa). Characteristic lesion of PG begins as painful deep nodule or a hemorrhagic superficial pustule, followed by dark red or painful, purplish inflammatory ulcerative lesion. PG is most commonly seen on the lower limbs, namely the pretibial area, but other areas like head, neck, breasts, genitalia, and upper extremities can be involved. In our case, the lesions are present over both buttocks,

perianal area and lateral malleoli. Four major clinical variants of PG have been described: ulcerative (classic), pustular, bullous, and vegetative (superficial). Clinically, the classical form (ulcerative) is characterized by rapidly progressing, painful ulcers with well defined, violaceous, undermined borders. The base of the ulcers has granulation tissue, which may be necrotic and covered by purulent exudates. The pustular type presents as is commonly associated with IBD. Bullous PG presents with grouped vesicles, which coalesce to form large bullae that ulcerate. The most uncommon and least aggressive is vegetative (superficial) type which presents as erythematous, ulcerated plaque without the characteristic undermined border.

When ulcer of PG heals, new epithelial growth connects the ulcer bed to the surrounding normal skin and finally results in cribriform scars. Many times the lesions appear after minor trauma, such as injections, insect bites, biopsies, or surgical incisions like breast surgery or caesarian section. This phenomenon is known as pathergy. It is an aberrant exaggerated inflammatory response to cutaneous tissue antigenically altered by trauma, and is observed in up to 30% of PG cases [5]. PG is an uncommon ulcerative, inflammatory disorder that can be challenging to diagnose. Diagnostic criteria for ulcerative pyoderma gangrenosum have been revised in March 2018 (Table 2). A Delphi consensus of international experts have given new, validated diagnostic criteria which helpsd in the diagnosis of PG [6].

At least the major criterion and four minor criteria must be fulfilled for diagnosis of PG. The new criteria represent our preferred approach to the diagnosis of PG. In our case, the major criteria and all the minor criteria except pathergy are fulfilled. Treatment of PG includes local wound care, topical and systemic therapy. Local wound cae reduces pain, provides protection and promotes healing and includes dressing with hydrocolloid/vaseline gauze or skin grafting. Topical therapy includes cromolyn sodium, topical glucocorticoids, tacrolimus, or hyperbaric oxygen. Alternative local therapies are intralesional injections of glucocorticoids, cyclosporine or tacrolimus. Systemic therapy may be required for severe cases or those refractory to local treatment. Initial therapy includes high dose corticosteroids, but if there is incomplete response to corticosteroids, then first choice is cyclosporine A or azathioprine. Second choice is mycofenolate mofetil, dapsone, chlorambucil, sulfasalazine or minocycline. For recalcitrant PG, cyclophosphamide, infliximab, thalidomide, tacrolimus can be used [7]. Cyclophosphamide, an anticancer drug, is now commonly used in many dermatologic disorders like bullous disorders, vasculitis and connective tissue disorders. Cyclophosphamide has immunomodulatory effects. It is thought to have these mechanisms of action [8]: elimination T regulatory cells ($CD4^+$, CD 25 + T cells) in the host and induction of T cell growth factors, such as IFN-1. A major side effect of cyclophosphamide is haemorrhagic cystitis, caused by the metabolite Acrolein, which is why it is given under the cover of Mesna (2 Mercapto Ethane Sulfonate Sodium) [9].

Biologics like TNF-α inhibitors (infliximab, adalimumab and etanercept) may be used. Surgical intervention like debridement and skin grafting may be harmful as there is risk of pathergy, but used when there is extensive necrosis of the skin or vital tissues like tendons and ligaments, are exposed at the ulcer bed. The prognosis of PG for most patients is generally good.

Conclusion

Pyoderma Gangrenosum is a chronic ulcerative condition for which specific laboratory investigations are not available. So it is mainly a diagnosis of exclusion and one needs a thorough knowledge of its types and clinical presentations.

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[1] Flink H, Tegelberg Å, Thörn M, Lagerlöf F. Effect of oral iron supplementation on unstimulated salivary flow rate: A randomized, double-blind, placebo-controlled trial. J Oral Pathol Med 2006; 35: 540-7.

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[9] National Statistics Online—Trends in suicide by method in England and Wales, 1979-2001. www.statistics.gov.uk/downloads/theme_health/HSQ20.pdf (accessed Jan 24, 2005): 7-18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.

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