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Original Article

Dermatology quality of life and psychological morbidity in patients with chronic dermatophytosis

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Abstract

Objective Dermatophytosis is defined as chronic when patients with dermatophytosis experience the symptoms for longer than 6 months to 1 year with or without recurrence after receiving sufficent treatment. The aim of our study is to assess the quality of life and psychological burden in patients with chronic dermatophytosis.

Methods A cross sectional descriptive study was conducted among 69 patients diagnosed with chronic dermatophytosis for a period of 4 months (Jan-April 2022). A preformed structured proforma was used, which included demographic data, duration, type, site, body surface area, severity of pruritus, Dermatology Life Quality Index (DLQI) and General Health Questionnaire (GHQ-12).

Results The mean age group was 38.6±11.7 with males (43.48%) and females (56.52%). The most common sites affected were thigh folds and trunk 24.64% each and itching being severe in 62.32% patients. The main domains affected by the DLQI questionnaire were symptoms and feelings followed by work and school with the mean total DLQI score of 12.7±7.3 (range 0-30). The GHQ score was more than 12 in 88.4% patients, with the mean total GHQ-12 score of 13.6±2.4 (range 0-12), indicating significant psychological influence of the disease. The correlation coefficient between GHQ-12 and DLQI was r=0.5, P<0.05, indicating a positive correlation between the two.

Conclusion Chronic dermatophytosis had a significant impact on psychosocial life of patient. Therefore it is important to treat and counsel patients regarding preventive measures, adherence to treatment and also these questionnaires can be used as tool of prognostic significance while following up patients in future.

Key words
Chronic dermatophytosis, Dermatology Life Quality Index, General Health Questionnaire.

Introduction

Dermatophytosis, often known as ringworm or tinea, is an infection of the skin or skin-derived tissues caused by filamentous fungus known as dermatophytes, which results in erythema, tiny papules, plaques, vesicles and scaling with ring-like morphology. The skin, hair, and nails are all keratinized tissues that are susceptible to invasion and growth by dermatophytes.[1]

Most of the superficial fungal infections are caused by dermatophytes ranging between 20-25% all over the world and in India it ranges from 36.6-78.4%.[2] The causative organisms include species of Trichophyton, Microsporum and Epidermophyton.

When patients with dermatophytosis experience the symptoms for longer than 6 months to 1 year with or without recurrence after receiving

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sufficient treatment, the condition is said to be chronic in nature.[1] In the India, the number of chronic and recurrent dermatophytosis has increased to epidemic levels during past 2-3 years.[3] Highest temperature and humidity, poor hygienic conditions and overcrowding offer favourable environment for the growth of dermatophytes in India.[4]

Environmental factors, inconsistent use of topical and oral antifungal drug, irrational use of steroids and fixed drug combinations (FDC) creams containing multiple molecules in a product, rising Trichophyton mentagraphytes infection rates that result in inflammatory lesions, and likely a rise in antifungal drug resistance may all have contributed to the persistence of fungal infection for an extended period of time and the development of chronic dermatophytosis.[5]

Persistence of skin infections have less mortality but it causes increase in morbidity of the patient especially in terms of psychiatric well being of the patient. Chronic dermatophytosis makes patient feel embarrassed when they are present on the exposed parts and also hampering their daily routine, social and sexual activities, which can lead to massive impact on one's life. Chronic and recurrent dermatophytosis are not only source of worry for patients and their family but also a therapeutic challenge for treating doctors.[6] Therefore, a more patient oriented approach in treatment of this disease is possible with an understanding of effect of chronic dermatophytosis on quality of life (QoL) and psychological morbidity.[7]

In our study, we are assessing the impact of chronic dermatophytosis on social and mental wellbeing of the patient by using standard questionnaire of DLQI to assess the quality of life and GHQ-12 questions to assess psychological morbidity in patient. As there are few studies conducted in India regarding the same, we would like to carry out this study for the benefit of the patients.

Methods

A cross sectional descriptive study was conducted at a Shimoga Institute of Medical Sciences, Shivamogga, Karnataka, for a duration of 4 months from January 1 2022 to April 30 2022 after obtaining approval from Institutional Ethical Committee (SIMS/IEC/660/2022-23).

Patients aged >18 years presenting with chronic dermatophytosis were recruited for the study after taking clinical history and detailed examination. In doubtful cases KOH examination of the skin scraping was considered.

Patients aged less than 18 years, chronic debilitated patients and mental illness were excluded from the study.

A detailed demographic data of the patient including name, age, sex, address, education, occupation, overcrowding (maximum number of people in 1 room is 2 persons, in 2 rooms are 3 persons, in 3 rooms are 5 persons, in 4 rooms are 7 persons and if more than 5 rooms then we add 2 persons for each additional room after 5 rooms) and number of family members affected by the infection were noted. Specific questions related to the duration of the infection, affected site of the body, body surface involved in percentage, treatment history in the form of antifungals or steroids and any other comorbidities patient is suffering from, were included in the proforma.

Pruritus was significant symptom of dermatophytosis and was categorized into none (grade 0) mild (grade1), moderate (grade 2) or severe (grade 3).

DLQI questionnaire containing 10 questions was considered to assess the QoL in patients suffering from chronic dermatophytosis.

In the questionnaire,

a) Physical symptoms and feelings (questions 1 and 2)
b) Daily activities (questions 3 and 4)
c) Leisure (questions 5 and 6)
d) Work/ school (question 7)
e) Personal relationships (questions 8 and 9)
f) Treatment (question 10)

Each questions of DLQI were scored as 0, 1, 2 and 3, as how their life was affected by the condition in the last one week **(Table 1)**.

The scores obtained were added together to find out the final scoring of DLQI ranging from 0-30. The scores were subdivided into different bands as proposed by Hongbo *et al*. **(Table 2)**.[8]

The general Health Questionnaire (GHQ-12) is designed to screen general (non psychotic) mental health issues among people in primary care settings.[9]

The questions of GHQ-12 are scored on a 4 point scale with influence on their mental wellbeing in the last 2weeks. It is scored using Likert scoring 0, 1, 2 and 3 with respect to positive and negative phrased items. In the questionnaire, question numbers 2, 5, 6, 9, 10 and 11 are negatively phrased. The total score of >12 indicates psychological influence of the condition on the patient's life.

Table 1 Scoring of DLQI questionnaire.

Score	*Inference*
0	Not at all
1	A little
2	A lot
3	Very much

Table 2 DLQI bands.

Score	*Inference*
0-1	No effect on quality of life
2-5	Small effect
6-10	Moderate effect
11-20	Very large effect
21-30	Extremely large effect

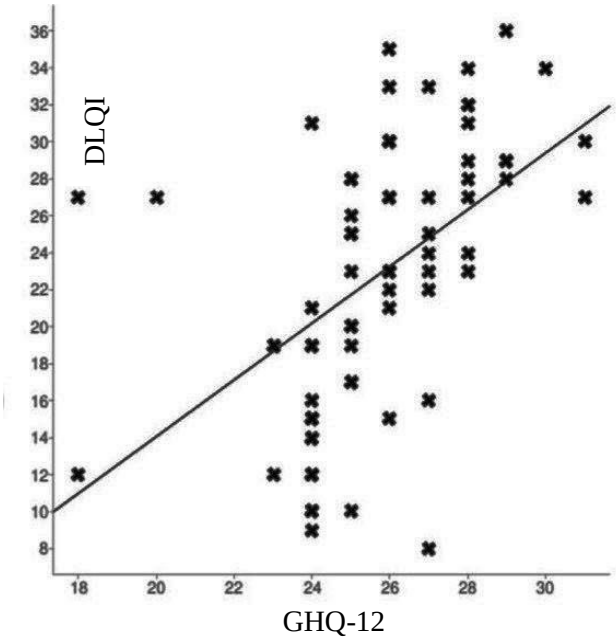

Figure 1 Scatter plot diagram representing a positive correlation between DLQI and GHQ-12.

Statistical analysis Data was entered in Microsoft excel and analysed using SPSS software version 24. Continuous variables were described using means and standard deviations (SD) and frequency and percentage were used to describe categorical variables. Pearson correlation test was used to find correlation of age with DLQI and GHQ-12. To find out correlation of BSA with DLQI and GHQ-12 Spearman rank correlation test was utilized.

Correlation between DLQI and GHQ-12 was depicted using scatter plot diagram **(Figure 1)**.

Results

Our study included a total of 70 patients, however 69 patients were finally eligible for the study as one patient's questionnaire was not

completely answered. Among these 39 (56.52%) were females and 30 (43.48%) were males. The mean age group of the study was 38.6±11.7 in years with mean duration of the disease for 7.9 months.

Twenty six (37.68%) patients were of intermediate educational status forming the major part of the study which had impact on their disease understanding, need for the treatment and compliance. Around 46 (66.67%) patients had history of irregular antifungals application, 20 (28.9%) with topical steroids application and 3(4.34%) with native medicine application. There was a positive family history with other family members being affected by the disease in 24 (34.78%) patients with overcrowding observed in 36 patients (52.17%). Among 69 patients, 49 (71%) patients were healthy with no comorbid conditions, 14 (20.29%) had diabetes mellitus and 6 with other health conditions **(Table 3)**.

The most common site of infection was found to be thigh folds and trunk (24.64%) in 17 patients respectively followed by 15 (21.74%) groin region, 10 (14.49%) gluteal region, 4 (5.8%) in toe web space and 3 (4.35%) each in palms and soles respectively. Thus, Tinea corporis was the major dermatophytic infection among our study group followed by Tinea cruris and least was Tinea pedis and manuum. Pruritus was the major complaint of all patients with severity being mild in 2(2.90%), moderate in 24 (34.78%) and severe in 43(62.32%) patients. Most of the patients had 25% of the body surface area affected by the infection **(Table 4)**.

DLQI The mean DLQI score of our study was 12.7±7.3 (range 0-30) indicating that there was large effect of dermatophytosis on their routine life. DLQI was categorized into bands with 31 patients in the range of 11- 20, 13 patients in (6-10), 11 in (21-30), 9 in (2-5) and 5 in (0-1). The most common domain affected was symptoms and feelings followed by work and school, daily activities, leisure and personal relationship indicated by median scores **(Table 5)**. Age and body surface area had significant impact on QoL, $p<0.05$ indicated by Pearson and Spearman rank test respectively, but gender showed no significant difference.

GHQ-12 The mean score of GHQ-12 was 13.6±2.4, indicating psychological influence of the disease on the patient's life. Out of 69 patients, 8 (11.59%) patients had GHQ <12 and 61 (88.4%) patients had GHQ >12 **(Table 6)**.

Table 3 Socio-demographic characteristics

Gender	Total patients=69
Male	30 (43.48%)
Female	39 (56.52%)
Mean age group inyears	38.6±11.7
Education	
Uneducated	6 (8.7%)
Elementary/matric	18 (26.08%)
Intermediate	26 (37.68%)
Graduate	19 (27.53%)
Overcrowding	36 (52.17%)
Positive family history	24 (34.78%)
Comorbidities	20 (28.99%)
Treatment history	
Antifungals	46 (66.67%)
Steroids	20 (28.9%)
Others	3 (4.34%)

Table 4 Clinical characteristics.

Mean duration of the disease	7.9 months
Pruritus	
Mild	2(2.9%)
Moderate	24(34.78%)
Severe	43(62.32%)
Site	
Thigh folds	17(24.64%)
Trunk	17(24.64%)
Gluteal region	15(21.74%)
Groin	10(14.49%)
Toe web space	4(5.8%)
Palms	3(4.35%)
Soles	3(4.35%)
Body surface area	
<5%	10(14.5%)
5-10%	17(24.63%)
>10%	34(49.27%)

Table 5 DLQI characteristics and median scores of items.

DLQI bands	*Patients (Mean score - 12.7±7.3)*
0-1	5 (7.25%)
2-5	9 (13.04%)
6-10	13 (18.84%)
11-20	31 (44.92%)
21-30	11 (15.94%)
DLQI domains	*Median scores of DLQI domains*
Symptoms and feelings (Q1-2)	3 (a lot)
Daily activities (Q3-4)	2 (a little)
Leisure (Q5-6)	3 (a lot)
Work and school (Q7)	2 (a little)
Personal relationship (Q8-9)	2 (a little)
Treatment (Q10)	2 (a little)

Table 6 GHQ-12 characteristics.

GHQ-12	Mean score: 13.6±2.4
<12	8(11.59%)
>12	61(88.4%)

Age and body surface area had significant psychological distress, P<0.05 indicated by Pearson and Spearman rank test respectively, but gender showed no significant difference.

There was a positive correlation of DLQI and NHQ score in the patients of chronic dermatophytosis indicated by correlation coefficient "r"=0.5, p<0.05 represented by scatter plot diagram **(Figure 1)**, indicating that those patient who had large effect of chronic dermatophytosis on their dermatological life quality also had significant psychological problems due to the same.

Discussion

The impact of various skin diseases on patient's QoL has been widely studied over the past 20 years, and a number of dermatology-specific tools have been designed to measure this impact, including Skindex, DLQl, the Dermatology Quality of Life Scales, and Impact of Chronic Skin Disease on Daily Life.[10] However, the DLQI is one of the most commonly used tools since it is brief and simple enough for patients to understand without the need for outside help.[11] Dermatophytosis once thought to be easily treatable with sufficient antifungals, now have significant impact on patient's QoL, emotional state and interpersonal relationships. But since there are not many comparable studies on the same, further original research on psychosocial effects by dermatophytosis is necessary.[7]

In our study, there was slight female preponderance (56.62%) compared to males, in contrast to other studies where males were high in study population.[12,13] A study by Bashir *et al.* had 68.25% of males compared to 31.75% of females in their study.[12] Another study by Shukla *et al.* included 76.62% males in their study.[13] This may be because most of our population were homemakers doing household chores continuously with constant sweating, unable to take care of themselves and staying in overcrowded homes has predisposed women to acquire this infection. Age group was concentrated between 38.6±11.7 years indicating working population and homemakers, having increased sweating, perspiration and physical activity.

The thigh folds and trunk (24.64%) were most commonly affected areas suggesting that Tinea corporis is the most common clinical dermatophyte infection, concurrent with study conducted by Rajashekar TS *et al.* where the most common clinical type was Tinea corporis- 106 cases (56.9%), followed by tinea cruris- 56 cases (28%) and low incidence of tinea pedis 7 cases (3.2%).[14] As most of the Indian females drape their saree tightly at the level of waist and along with friction between two thighs made these two sites being more commonly involved in the present study. Most of the patients had severe pruritus (62.32%) in contrast to other studies[12,15] where moderate intensity of pruritus

was common, and this pruritus further lead to constant itch scratch cycle thus, contiguous spread of lesions as well as distant spread of infection which added to the impairment in quality of life. A study by Bashir *et al.* found moderate pruritus in 40% of study population.[12] In another study by Patro *et al.*, who measured pruritus using 5D-pruritus scale found moderate intensity of pruritus in most of their patients.[15]

The mean DLQI score of our study was 12.7±7.3, which falls into the band of 11-20, similar to findings from other studies.[12,14,15] In a study conducted by Rajashekar TS *et al.* out of 186 patients, 98 patients (52.7%) were in the band of 11-20 showed very large effect.[14] In another study by Bashir S *et al.*, the mean DLQI score was 13.93±6.26.[12] Patro *et al.* conducted a study on 294 patients and found mean DLQI score 12.12±5.04 in the age range of 18-40 years and 12.46±5.83 in patients with 41-60 years age.[15] The most common affected domain in our study was symptoms and feelings followed by work and school in similar view with other studies.[16] Varshney AP conducted a study of QoL which showed symptoms and feelings being more affected in their study.[16] This was mainly because of the chronicity of the condition, being present on exposed sites with more percentage of body surface involved and severe pruritus where patients were bound to scratch in front of other people which was unacceptable in open environment. Age and body surface area had significant impact on patients QoL indicated by $p<0.05$.

Physical repercussions of dermatophytosis are less common than psychosocial effects such as low self-esteem, discomfort, apprehension and depression.[5] We found that mean GHQ score of our study was 13.6±2.4, which indicates that there was psychological distress in the patients of chronic dermatophytosis which correlated with age and extent of body surface area involved ($P<0.05$). In concurrent with a study conducted by Narang *et al.*, where out of 179 patients, 152 (84.9%) had a score greater than or equal to 12 with the mean GHQ score of 16.98.[6] Most of the chronic conditions leads to psychological morbidity as patients are tired of understanding evolution of the disease, lack of compliance, lack of adherence to treatment and maintenance of hygiene practices. This inturn leads to chronicity of condition and increase in psychosocial impact of the disease on ones lifestyle. Therefore, the most important part of treating chronic dermatophytosis remains in counseling of patient regarding the nature of disease, and the disease is being curable with proper medications taken for correct duration of time and maintenance of hygiene practices. There was a significant disturbance in QoL in patients suffering from chronic dermatophytosis similar to other chronic conditions like psoriasis, vitiligo and urticaria.[6]

There was a positive correlation between DLQI and GHQ scores, correlation coefficient $r=0.5$, $P<0.05$ indicating that patient who had large effect of disease on their quality of life also had psychological distress associated with the condition. Our result was similar to a study conducted by Narang *et al.* where GHQ-12 had a significant correlation with the DLQI score (correlation coefficient $r=0.3$; $P<0.05$).[6]

Limitations Small sample size of the study and conducted for shorter duration of time.

Conclusion

The present study shows that there is large impact of chronic dermatophytosis on psychosocial life of patient and questionnaire can be used as a tool for prognostic significance of the disease. Patients should be adequately counseled about the disease and this should be one of the objectives in the treatment guidelines

of the infection which can help patient to overcome the disease.

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