The Menace of Superficial Dermatophytosis on the Quality of Life of Patients Attending Referral Hospital in Eastern India: A Cross-sectional Observational Study

Abstract

**Background:** Superficial dermatophytic infections have come up with multiple challenges and comorbidities recently regarding its chronic and recurrent course. **Aims:** The present study aims at measuring the impact of the disease on the quality of life (QoL) of the patients. **Methods:** A cross-sectional observational study was conducted over 6 months. The patients attending the dermatology outpatient department were recruited after screening and were made to fill up the Dermatology Life Quality Index (DLQI) and 5D-pruritus scale questionnaires. The P value was calculated and data were compared using the Pearson’s correlation coefficient. **Results:** A total of 294 patients were studied. The effect on QoL was estimated to be moderate [males, ≤10% body surface area (BSA) involvement, ≤6 months duration, low and medium socio-economic status (SES)] to very large (females, >10% BSA involvement, >6 months duration, high SES, and medium and high educational status) according to the DLQI scoring and correlated strongly with the disability scoring in 5D-pruritus scale ($r = 0.802, P < 0.0001$). **Limitations:** Small sample size of the study may not reflect the impact on general population, urging the need for multicenter studies. **Conclusions:** Although considered previously as a simple fungal infection, the present state of superficial dermatophytosis has emerged as a social, psychological, and economic burden on the society.

**Keywords:** 5D Pruritus scale, chronic/recurrent dermatophytosis, Dermatology life quality index, quality of life, superficial dermatophytosis/tinea

Introduction

In this era of epidemic superficial dermatophytosis, it is the most common\(^1\) infective dermatoses encountered in the dermatology outpatient departments, and the recent trend is that of chronic or recurrent dermatophytosis. The various factors attributable to this trend are environmental factors, erratic use of antifungal agents, and increased prevalence of *Trichophyton mentagrophytes* infections causing more of inflammatory lesions, irrational use of topical steroids combinations, and probably an increasing resistance to antifungal agents.\(^2\) The multiple aspects of the dermatoses are recently being studied and discussed on all national and state-level dermatological forums.\(^3\) In this study, we have tried to assess the least examined aspect, i.e., the quality of life (QoL) of the patients suffering from superficial dermatophytosis.

Methods

The study was conducted over a period of 6 months after obtaining approval from the institutional ethics committee. The patients presenting with superficial dermatophytic infections were thoroughly examined. All KOH positive or culture positive cases for dermatophytes between the age group of 18 and 60 years suffering from fungal infection for ≥1 month with or without prior treatment with antifungals were enrolled in the study. All the isolated nail or scalp/hair affected patients, bedridden moribund patients, and patients having comorbidities such as diabetes mellitus, thyroid disorders, pregnancy, psychiatric abnormality, and any other preexisting dermatoses were excluded. Patients undergoing treatment with corticosteroids in any form (oral/topical/injectable) and/or any other immunosuppressant were not included in our study.
After informed consent, all patients were asked to fill two questionnaires (English/vernacular version), i.e., the Dermatology life quality index (DLQI) and the 5D-pruritus scale. The effect on the QoL was measured and correlated based on the scoring in the above two scales, and the intensity of pruritus was measured from the 5D-pruritus scale scoring. The 5D-pruritus scale has been formulated by Elman et al.\(^4\) as a measure of pruritus, whereas the DLQI has been postulated by Finlay et al.\(^5\) as a measure of QoL in patients suffering from any skin disease.

**Calculations**

The scoring of DLQI questionnaire was done out of total 10 questions according to the patients response, which ranged from 0 to 30 points, and the assessment of effect on QoL was done based on the points as 0–1 (no effect), 2–5 (small effect), 6–10 (moderate effect), 11–20 (very large effect), and 21–30 (extremely large effect). The scoring of 5D-pruritus scale was done ranging from 5 to 25 points, and the intensity of pruritus was assessed as points 5–10 (mild), 11–15 (moderate), 16–20 (severe), and 21–25 (very severe). The total points in the disability domain containing four items were calculated to assess the impact of itching on the QoL from the 5D-pruritus scale. The Pearson’s correlation coefficient was calculated to compare the effect on the QoL as measured from DLQI and the disability domain of 5D-pruritus scale. Kuppuswamy’s revised socio-economic status (SES) scale\(^6\) was used for grading of socio-economic class [modified as High-Upper (I), Medium-Upper Middle (II), Lower Middle (III), Low-Upper Lower (IV), and Lower (V)] and educational status (ES) (modified as High-Profession/Honors and Graduate/Postgraduate, Medium-Intermediate/Post high school and High school, Low-Middle school, Primary school, and Illiterate).

**Results**

A total of 294 patients were recruited in our study [Table 1] with 255 patients in the age range of 18–40 years and 39 patients in the range of 41–60 years. Almost equal number of patients presented in both sexes with 156 females and 138 males. Out of the total 294 patients, 51 presented with ≤10% body surface area (BSA) involvement and 243 presented with >10% BSA involvement. The various clinical subtypes encountered were tinea corporis (237 patients), tinea cruris (225 patients), tinea unguium (10 patients), tinea mannum (7 patients), tinea pedis (6 patients), and tinea capitis (4 patients). The duration of the lesions was ≤6 months in 174 patients and >6 months in 120 patients. A history of close contact with similar disease could be obtained in 227 (77.21%) patients and an occlusive type of clothing habit was found in 281 (95.58%) patients. Close contacts were taken as family members living together or inmates in hostel or mess. The normal clothing habit in our region is pant and shirt in males and saree, salwar suit, leggings or jeans in females. This type of clothing for around 8 hours in a day was taken as occlusive type of clothing habit. According to Kuppuswamy’s classification,\(^6\) most of our patients [Table 1] belonged to medium SES (51.02%) and with medium educational qualifications (60.20%).

According to the DLQI questionnaire [Table 2], the mean ± SD DLQI was 12.12 ± 5.04 in the age range of 18–40 years and 12.46 ± 5.83 in patients within 41–60 years age (P = 0.703). The mean ± SD DLQI according to the sex (P = 0.0034), duration of lesions (P = 0.0003), distribution of lesions (P = 0.0016), SES (P < 0.0001), and ES (P < 0.0001) were 10.67 ± 5.63 (males), 13.48 ± 4.28 (females), 10.90 ± 5.63 (≤6 months), 14 ± 4.8 (>6 months), 10.06 ± 5.34 (≤10% BSA), 12.60 ± 5.01 (>10% BSA), 17.45 ± 2.73 (High SES), 10.76 ± 3.64 (Medium SES), 7.79 ± 4.88 (Low SES), 17.24 ± 3.00 (High ES), 11.64 ± 4.11 (Medium ES), and 5.28 ± 2.00 (Low ES), respectively.

Calculating the intensity of itching according to the 5D-pruritus scale [Table 2], the mean ± SD 5D score according to the age (P = 0.957), sex (P = 0.607), duration of lesions (P = 0.732), distribution of lesions

### Table 1: Demographic profile of superficial dermatophytosis patients

| Variable                  | Number of patients (%) n=294 |
|---------------------------|------------------------------|
| Age (years)               |                              |
| 18–40                     | 255 (86.73%)                 |
| 41–60                     | 39 (13.27%)                  |
| Sex                       |                              |
| Male                      | 138 (46.94%)                 |
| Female                    | 156 (53.06%)                 |
| Distribution (BSA)        |                              |
| ≤10%                      | 51 (17.35%)                  |
| >10%                      | 243 (82.65%)                 |
| Duration of disease (months) |                            |
| ≤6                        | 174 (59.18%)                 |
| >6                        | 120 (40.82%)                 |
| Contact history           |                              |
| Present                   | 227 (77.21%)                 |
| Absent                    | 67 (22.79%)                  |
| Clothing                  |                              |
| Occlusive                 | 281 (95.58%)                 |
| Nonocclusive              | 13 (4.42%)                   |
| SES                       |                              |
| High                      | 87 (29.59%)                  |
| Medium                    | 150 (51.02%)                 |
| Low                       | 57 (19.39%)                  |
| ES                        |                              |
| High                      | 75 (25.51%)                  |
| Medium                    | 177 (60.20%)                 |
| Low                       | 42 (14.29%)                  |
(P = 0.361), SES (P < 0.0001), and ES (P < 0.0001) were 13.01 ± 2.53 (18–40 years age), 13.15 ± 2.57 (41–60 years age), 13.54 ± 2.10 (females), 12.46 ± 2.85 (males), 12.67 ± 2.46 (≤6 months), 13.55 ± 2.10 (>6 months), 11.53 ± 1.99 (≤10% BSA), 13.35 ± 2.56 (>10% BSA), 14.62 ± 1.95 (High SES), 12.78 ± 2.27 (Medium SES), 11.26 ± 2.59 (Low SES), 14.80 ± 1.75 (High ES), 13.03 ± 2.26 (Medium ES), and 9.86 ± 1.52 (Low ES), respectively. The 5D disability domain score correlated strongly [Figure 1] with the DLQI disability score (r = 0.802, P < 0.0001) and also individually for each variable. The Pearson’s correlation coefficients were r = −0.157, P = 0.012 (18–40 years age); r = −0.541, P < 0.0001 (41–60 years age); r = 0.765, P < 0.0001 (females); r = 0.851, P < 0.0001 (males); r = 0.832, P < 0.0001 (≤6 months); r = 0.758, P < 0.0001 (>6 months); r = 0.849, P < 0.0001 (≤10% BSA); r = 0.789, P < 0.0001 (≥10% BSA) for the various variables.

Discussion

Superficial dermatophytosis commonly called as tinea infection includes superficial fungal infection of the skin, hair, and nail. *Trichophyton rubrum* has been attributed to be the most common causative dermatophyte in India, although studies from different geographic locations have found preponderance of *Trichophyton mentagrophytes* and *Microsporum audouinii*. It is a common skin infection since years with well-known antifungal agents available. Recently, it has become challenging for the dermatologists to treat the increasing number of chronic and recurrent cases encountered daily. Chronic dermatophytosis has been described as disease duration of >6 months to 1 year, with or without recurrence in spite of treatment. Recurrent dermatophytosis was previously referred arbitrarily to the recurrence of the infection within few weeks after...
QoL is the general wellbeing of a person, which includes physical health, sexual, social, psychological, educational, occupational, as well as financial wellbeing. The most important parameter is a healthy body and the mere presence of any disease can have impact on all the aspects of the QoL. The major concern in patients suffering from superficial dermatophytosis is pruritus. Although it seems to be a minor symptom, but if present in severe form and for long duration drastically affects the QoL of the patient. Another major impact of any skin disease is the cosmetic embarrassment due to obvious visibility of the lesions. This restricts the patient's social interactions and greatly impairs the QoL. Considering the treatment aspect, the use of topical preparations over large affected skin areas for longer duration makes the process messy and unfeasible affecting the daily routine of the patient. Also, the high cost and prolonged duration of therapy is a financial burden for the low to average socio-economic group and contributes to treatment nonadherence.

Itching or pruritus is a subjective and multidimensional symptom experienced by a person and is difficult to quantify. Normally, visual analogue scale has been used frequently to quantify pruritus. It assesses the severity of the symptom, but fails to account the impact of pruritus on the QoL. Chronic pruritus can significantly reduce the QoL and subsequently lead to severe disability. The 5D itch questionnaire was developed by Elman et al.[9] as a measure of pruritus that is brief, faster to complete, easy to score, sensitive to the multidimensional aspect of pruritus and its effect on the QoL, applicable to multiple diseases, and capable of detecting change over time. The five dimensions of the questionnaire are degree, duration, direction, disability, and distribution of pruritus.

Assessing the QoL of patients according to the DLQI questionnaire as evident in the results section, we found a very large effect (score 11–20) on QoL equally in patients of both age ranges. The overall effect on the QoL was moderate (score 6–10) in case of males, patients presenting with ≤6 months duration of lesions, patients with ≤10% BSA affected, and patients belonging to low to medium SES as compared to very large (score 11–20) effect in case of females, patients having >6 months duration of lesions, patients with >10% BSA affected, patients belonging to high SES, and patients with medium to high educational qualification.

With regard to individual aspects of DLQI questionnaire, the skin symptoms (itchy, sore, painful, stinging) were the most frequently affected aspect with mean score ± SD of 2.30 ± 0.70, followed by impact on embarrassment/self-consciousness, clothing, social/leisure activities, interaction with partner/friends/relatives, and treatment aspects of DLQI questionnaire with mean scores ± SD of 1.90 ± 0.80, 1.54 ± 1.02, 1.42 ± 0.86, 1.31 ± 0.78, and 1.16 ± 0.75, respectively. The least affected aspects in our study were sports and sexual difficulties with mean scores ± SD of 0.16 ± 0.52 and 0.35 ± 0.66, respectively.

The pruritus intensity was measured as moderate (score 11–15) in the 5D-pruritus scale in almost all the age ranges, sexes, duration, distribution patterns, socio-economic class, and ES in our study. The QoL assessment from the DLQI questionnaire and the disability domain of 5D scale correlated strongly [Figure 1] with each other (r = 0.802, P < 0.0001).

In our study we observed a statistically significant difference [Table 2] in the DLQI among the different sexes, distribution pattern, duration of disease, socio-economic class, and ES. Also, a significant difference was observed [Table 2] in the 5D-pruritus score among the various SES and ES groups.

Limitations

The small sample size in our study may not reflect the overall status of QoL in patients with superficial dermatophytosis in the general population and highlights the need of the hour for multicentric studies. Also, the QoL effect in individual clinical subtypes could not be measured as most of the patients presented with multifocal disease.

Conclusion

To conclude, chronic and recurrent dermatophytosis are socially, emotionally, and economically a significant distress for the patients. In this study on superficial dermatophytosis, we found a moderate to very large effect of the disease on the QoL of the patients in general and a relatively greater impact was observed in case of females, patients with longer duration of disease, multifocal distribution of lesions, patients of higher SES and higher educational qualification. The intensity of pruritus was felt significantly more in the higher socio-economic class and highly qualified persons. The QoL as measured in two different scoring systems correlated strongly with each other. Along with a large number of studies being undertaken to figure out the burden of the disease in terms of its epidemiology and etiopathogenesis, more studies are needed to understand its effect on the QoL of the patients, and along with medications, counselling and health education form a major part for an effective management.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patients have given their consent for their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due
efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

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