The effect of oral doxycycline and topical 5% benzoyl peroxide on quality of life in patients with mild to moderate acne vulgaris

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Abstract

Objective The purpose of the study was to determine the impact of mild to moderate acne vulgaris on quality of life (QoL) and to assess the effect of oral doxycycline and topical 5% benzoyl peroxide treatment on QoL.

Patients and methods One hundred patients, of either sex, suffering from mild to moderate acne vulgaris, were asked to fill the Dermatology Life Quality Index (DLQI) pro forma (Urdu and English version) independently before starting the treatment. The total score ranged from 0-30. The higher the score, the greater was the impact on QoL. All the patients were subjected to oral doxycycline 100 mg daily and were asked to apply 5% benzoyl peroxide once daily. Patients used these medicines for a period of three months, after which they were again asked to fill the DLQI pro forma. The data were analyzed after compiling the results.

Results The results of 100 patients, who completed the study, were compiled. The mean age of patients was 20.45±3.27 years. Among 20 male patients, 8 suffered from grade 1 and 12 from grade 2 acne. Among 80 female patients, 9 suffered from grade 1 and 71 from grade 2 (p=0.012), showing a significant association between grading of acne with respect to gender of the patient. The disease was notably severe among females. Duration and progression of disease showed no significant effect on QoL. Before treatment, the mean DLQI score for females was 14.05±6.32 with minimum score of 1 and maximum score of 25. The mean score for male patients was 12.63±6.46 with minimum score of 1 and maximum of 26, showing that QoL is worse among females as compared to males. The mean pretreatment score was 12.92±6.43. The score dropped to 5.34±3.14 (p=0.000) after treatment showing that there is a significant improvement in quality of life of these patients.

Conclusion The study shows that mild to moderate acne vulgaris has a very large effect on the quality of life of our patients with significant psychosocial limitations. The combination treatment of oral doxycycline and topical 5% benzoyl peroxide significantly improves the quality of life in acne patients.

Keywords Acne, quality of life, doxycycline, benzoyl peroxide, dermatology life quality index.

Introduction

Acne is primarily seen in adolescents.1,2 It is characterized by a variety of lesions such as comedones, papules, pustules and nodules followed by pitted or hypertrophic scars.2,3 Acne vulgaris is one of the most common skin diseases in our society.1 It is due to an increased sebum production, hypercornification of the pilosebaceous unit, colonization with Propionibacterium acnes and inflammation.1,2 While acne does not affect the health overall, its impact on emotional well-being can be critical and is associated with depression, anxiety and higher
than average unemployment rates. The choice of treatment depends upon clinical severity of disease. Mild acne needs topical therapy while in moderate to severe acne, systemic treatment is also required. The topical compounds are benzoyl peroxide, antibiotics and retinoids. Tetracyclines, doxycycline, minocycline, erythromycin, azithromycin and isotretinoin are the most widely used oral compounds.

Quality of life (QoL) is defined as the capacity to perform daily activities appropriate to person’s age and his/her major role in the society. The role could be paid employment, schooling, house work or self care. Several indices are available in the form of questionnaires to measure the extent of disability caused by skin diseases. In order to assess the impact of acne on QoL in our society, a ten-item DLQI was used. It is a valid, simple and practical questionnaire designed to measure the disability caused by various skin conditions. Facial appearance plays an important role in self-perception and interaction with others and a disease like acne leave a deleterious impact on patient’s quality of life.

In the present study, the effect of oral doxycycline and topical 5% benzoyl peroxide on QoL in patients with mild to moderate acne vulgaris was observed to quantify the level of handicap experienced by our patients with acne before and after therapy.

**Patients and methods**

It was a questionnaire-based study. The study protocol was approved by the Hospital Ethical Committee. It was carried out at the Department of Dermatology, King Edward Medical University/ Mayo Hospital, Lahore, during the period from May 1, 2010 to October 31, 2010. A full medical history and clinical assessment of the acne patients, with informed consent, was taken. Demographic characteristics like age, gender, address, occupation, marital status and severity of disease were recorded. A total of 142 patients, of either sex but of the age 14 years or above, with clinically diagnosed acne of mild to moderate acne according to FDA Global Acne Grading Scale, who could themselves complete the questionnaire in English or Urdu version, were enrolled.

Patients with co-existing major systemic diseases like known diabetes, Cushing syndrome, known hepatitis etc., with known neurological and psychological diseases and or other local facial dermatoses (melasma, vitiligo, nevi, rosacea, fixed drug eruption and photosensitivity) were excluded from the study. Pregnant and lactating females and patients taking systemic therapy for the last two months and topical therapy for the last one month were not taken. Patients who had been taking drugs that cause acne e.g. steroids, contraceptives, sulphur, isoniazid, hydantoin, lithium, bromides, iodides etc. were also omitted. Patients with known allergies to doxycycline or benzoyl peroxide were also excluded.

All the patients were instructed to fill a DLQI questionnaire that included 10 questions covering six different domains of QoL e.g. symptoms and feelings (Q1, 2), daily activities (Q3, 4), leisure activities (Q5, 6), work and schooling (Q7), personal relationships (Q8, 9) and treatment of disease (Q10). They were asked to score, on a scale from 0 to 3, for each of 10 questions, how they felt their lives have been affected by the disease over the preceding week. The response for each question could be 0=not at all, 1=a little, 2=a lot and 3=very much. The total score ranged from 0 to 30. The higher the score, the poorer was the quality of life.
All the patients were advised to take oral doxycycline 100 mg daily and apply 5% benzoyl peroxide once daily. They used medicines for a period of three months after which they were asked to fill the DLQI pro forma independently again. They were asked not to use anything on the affected area other than the prescribed treatment. Throughout the study, all patients were followed up monthly in order to assess the efficacy (50% clearance of lesions after 3 months). The data were entered into SPSS version 11 for analysis. Study variables included age, gender and DLQI scores. Descriptive statistics were used. For quantitative variables like age and DLQI scores, mean and standard deviation were calculated. For qualitative variables like gender, frequency and percentage were calculated. The statistical analysis was done and a p-value of <0.05 was considered significant.

Results

In this study, 142 patients were enrolled. 34 were lost to follow-up and 8 patients discontinued the treatment due to side effects. A total of 100 patients, were evaluated. There were 80 female and 20 male patients. Mean age of patients was 20.64 ±3.27 years. All males and majority of female patients were single. Out of 20 male patients, 8 suffered from grade 1 while 12 patients suffered from grade 2 acne. Among 80 female patients, 9 suffered from grade 1 while 71 had grade 2 acne (p=0.012), showing a significant association between grading of acne and gender of the patient. Regarding the profession of patients, majority i.e. 57 were students, 26 housewives, 6 teachers, followed by bankers, doctors and businessmen 2 each, lawyer, shopkeeper, laborer, tailor and income tax officer were 1 each.

Mean duration of disease in years in all the patients was 2.09±2.07 ranging from 0.33 to 11 years. No significant relationship was found between age and QoL and duration of disease and QoL of the patients. The DLQI scores before and after treatment according to grades of acne and marital relationship was noted. We did not find any statistically significant difference in DLQI score between the two grades of acne before and after treatment. Whereas the results were statistically significant among single and married patients before and after treatment (p=0.002 and 0.001, respectively).

The mean DLQI score of all the patients before starting treatment was 12.92±6.43 and after treatment, it came down to 5.34±3.14. The mean score of quality of life improved significantly after treatment (p=0.000). According to the gender, similar change was recorded with scores being higher among females. The statistically significant improvement was seen after treatment (p=0.000). Table 1 compares the mean scores in all six domains of DLQI, symptoms and feelings (Q1 and 2), daily activities (Q3 and 4), leisure activities (Q5 and 6), school and work (Q7), personal relationships (Q8 and 9), treatment (Q10) before and after treatment.

Table 1 Dermatology life quality index (DLQI) scores before and after treatment.

<table>
<thead>
<tr>
<th>DLQI indices</th>
<th>Score before treatment</th>
<th>Score after treatment</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptoms and feelings</td>
<td>4.80±1.03</td>
<td>1.80±0.92</td>
<td>0.000*</td>
</tr>
<tr>
<td>Daily activities</td>
<td>2.10±1.86</td>
<td>1.05±1.24</td>
<td>0.004*</td>
</tr>
<tr>
<td>Leisure activities</td>
<td>1.95±1.68</td>
<td>1.14±1.55</td>
<td>0.001*</td>
</tr>
<tr>
<td>Work and school</td>
<td>1.67±1.42</td>
<td>1.00±0.00</td>
<td>0.105</td>
</tr>
<tr>
<td>Personal relationships</td>
<td>1.67±1.52</td>
<td>1.00±1.09</td>
<td>0.003*</td>
</tr>
<tr>
<td>Treatment</td>
<td>0.00±0.00</td>
<td>0.57±0.87</td>
<td>0.007*</td>
</tr>
</tbody>
</table>

*Significant p value ≤ 0.05
All the indices except for work and school showed a significant change with treatment. All the indices showed improvement after treatment except for Q10 (treatment) which showed a negative effect. The most affected domain was of symptoms and feelings.

The efficacy and safety profile of treatment was studied at week 4, 8 and 12 which showed improvement in 24% patients at week 4, 53% at week 8 and 82% at week 12. Few side effects including burning and tingling were felt by the patients. These were mild and reversible.

Discussion

Acne vulgaris is a widespread disease that has its impact on quality of life in all dimensions which is in accordance with studies conducted at international level. The effect of acne vulgaris on psychology of patients was described by Sulzberger and Zaidens initially. According to them, there is no other disease which causes more psychological trauma, maladjustment, inferiority complex and insecurity than acne. It has been hypothesized that even mild acne can decrease a person’s self-confidence, body image, willingness to be seen in public and social interactions. QoL has been defined as a useful measure which assesses the functioning, well-being and life satisfaction of an individual. QoL is emerging as one of the recent trends in assessing treatment response from the patient’s point of view.

The present study was conducted to evaluate the effect of acne vulgaris on overall quality of life. Globally used Dermatology Life Quality Index (DLQI) score was employed to assess the effect of acne on quality of life of patients. This score was used because it is relatively comprehensive and self-explanatory, and it has been widely employed in other national and international studies as well. The mean age of patients was 20.64±3.27 years in our study which correlates with the study by Hafez et al. in which the mean age of patients was 20.1±3.1 years. The mean age for males was 21.95±3.83 years and for females 20.31±3.05 years. We found no correlation between age and DLQI scores which correlates with the study conducted by Takahashi et al. Conversely in a study by Lasek et al., the effect on QoL was greater in older patients. This could be due to different assessment tool used in that study or could be the fact that acne among adolescence is more acceptable among their peers whereas it is not in the older age group.

According to gender, only 20% male while 80% female subjects were recorded. It indicates that females suffer from acne in a greater proportion as compared to males. In the study by Takahashi et al. 77.2% females had acne problem that supports the results of our study. Females are more conscious about their facial appearance as compared to males which might be the reason for females coming to the hospital in a greater number even for mild to moderate acne in our study.

In our study, a significant association was found between gender and grades of acne severity \( (p=0.012) \). In other studies also, gender differences were found to be significant for acne severity. The worsening of disease could be explained by the fact that in our society there is misuse of cosmetics and steroids by the females for treatment of pimples. The QoL between grade 1 and grade 2 acne patients showed no statistically significant difference \( (p\geq0.881) \). Similar findings were made by Gupta et al. whereas the study carried out by Kulthanan et al. showed that mild acne had a lower DLQI score compared to moderate and severe acne.

The QoL of female acne patients, was found to be significantly impaired as compared to
males ($p=0.000$). Jones-Caballero et al. and Kulthanan et al. in their studies found that acne vulgaris affects female patients more than males, which also supports the results of our study.3,20 In a Turkish study, no significant difference on quality of life was found between male and female patients.21 In the study of Hafez et al. the score of QoL was greater among males.12 The difference could be due to the fact that the number of female patients enrolled in our study is high and it is known that women are more conscious of their appearance in our society. According to the marital status, the QoL score between single and married patients is statistically significant before and after treatment ($p=0.002$ and 0.001, respectively). Unmarried patients were found to be more affected by acne than married patients. In our culture of arranged marriages, physical appearance is considered an important factor and therefore the single patients seem to have worse QoL score.

The relation between QoL and progression of disease was also determined. We found no significant correlation between duration of acne and its effect on QoL. This is supported by the study conducted by Kokandi6 in which the duration of disease did not show any effect on QoL of acne patients. The observation made by Klassen et al.17 is different from ours. They found that with a prolonged duration of acne the QoL was worse. This could be explained by the fact that different study tools were used by them and the mean duration of disease recorded was 10 years which is different from our study where mean duration of disease was much less.

Before commencing treatment the mean DLQI scores of different indices were found to be higher with regard to symptoms and feelings, daily activities, leisure and personal relationships. This shows the negative effect of acne vulgaris on QoL of patients which is in accordance with the study done by Hafez et al.12 In the present study, mean DLQI scores were highest for questions related to symptoms and feelings (Q1 and 2) with mean score of $4.80\pm1.03$, implying that this is the most severely affected domain in our patients’ lives. This result is also comparable to Hafez et al. study, where this domain had the greatest mean score also i.e. $3.8\pm1.8$.12 Similar to the study by Kulthanan et al. the question pertaining to embarrassment (Q2) scored the highest.20 The acne lesions are more visible to everyone in daily routine life causing more embarrassment. Other domains were adversely affected as well, Q3 and 4 pertaining to daily activities had a significant effect which shows that acne hinders in the routine household work and shopping which is not due to the functional disability but rather the emotional one. Scores of questions regarding leisure activities (Q5 and 6), Q7 about work and school Q8 and 9 about personal relationships prove that acne affects all aspects of one’s life. Q10 was scored zero in all cases because the pro forma (questionnaire) was marked by each patient before commencing the treatment.

The effect of treatment on mild to moderate acne was assessed and it was found that 82% patients improved after 12 weeks of treatment. We also found that the overall quality of life significantly improved after treatment, mean score of all the patients before commencing the treatment was $12.92\pm6.43$ which decreased to $5.34\pm3.14$ after completion of treatment ($p=0.000$), that is similar to what had previously been studied, in which quality of life improved as the severity of disease reduced.21,22 The DLQI scores of all the domains showed significant improvement after treatment. Regarding Q10, there was worsening of score after treatment ($p=0.007$). This particular question was related to difficulties faced during treatment e.g. wastage of time, money and treatment being messy, which is understandable in our set up among patients seeking treatment for any disease in a
tertiary care hospital. In a study by Akyazi et al., assessing the QoL before and after treatment in acne vulgaris, significant improvement was observed in QoL after treatment. Newton et al. also assessed the effect of anticancer therapy on 111 patients, it was observed that treatment substantially improved scores on QoL instruments. These results also correlate with our study. The gender-wise DLQI scores showed statistically significant improvement after treatment with oral doxycycline and topical 5% benzoyl peroxide ($p=0.000$). The change was more marked among females. The difference can be explained by the fact that number of female patients inducted was much higher than males in our study. In future, more studies with increased or equal number of male patients need to be carried out.

In the end, dermatologists should be aware of the negative impact of disease and should try effective remedy for this problem. Patients with high score may also benefit from counseling and/or contact with psychologist, so that appropriate psychological intervention can be made in addition to drug treatment, if required.

Conclusion

The present study confirmed the psychological effects of mild to moderate acne vulgaris on quality of life and the combination treatment of acne with oral doxycycline and topical 5% benzoyl peroxide resulted in superior patient outcomes regarding disease and quality of life. The study also reflected that impairment of QoL is greater in females and those with severe disease. During daily life, symptoms and feelings followed by personal relationships are found to be more severely affected in our cases.

References


