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Original Research

Family impact of pemphigus disease in an Iranian population using the Family Dermatology Life Quality Index

S. Zahra Ghodsi MD [a,*], Arefeh Asadi MD [a], Narges Ghandi MD [a], Kamran Balighi MD [a], Hamidreza Mahmoudi MD [a], Robabeh Abedini MD [a], Maryam Ghiasi MD [a], Vahideh Lajevardi MD [a], Cheyda Chams-Davatchi MD [a], Maryam Daneshpazhooh MD [a]

[a] *Autoimmune Bullous Diseases Research Center, Razi Hospital, Tehran University of Medical Sciences, Tehran, Iran*

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ABSTRACT

Background: Pemphigus vulgaris (PV) is a rare but seriously disabling disorder of the skin and mucous membranes that can gravely impact the quality of life (QoL) of patients.
Objective: The aim of the present study was to identify how family members of patients with PV are affected by the disease.
Methods: A total of 118 patients with confirmed PV and one of their family members (caregivers) were enrolled in the study. To calculate disease severity, the Autoimmune Bullous Skin Disorder Intensity Score was used. The Persian version of the Dermatology Life Quality Index (DLQI) questionnaire was used to evaluate the QoL of patients and the Family Dermatology Life Quality Index (FDLQI) to evaluate the QoL of caregivers.
Results: The mean age of patients was 43.14 ± 12.5 years. Ninety patients (76.3%) were female. Eighty-one patients (68.6%) had the mucocutaneous phenotype and 37 cases (31.4%) the mucosal phenotype. The DLQI score was 10.1 ± 7.1 for patients. The DLQI score was higher for patients with the mucocutaneous phenotype (11.8 ± 7.5) than those with the mucosal phenotype (6.4 ± 4.9; $p < .001$). QoL was significantly affected by disease severity. FDLQI score was 13 ± 7 for caregivers, and was significantly higher in older caregivers and married ones. There was a positive correlation between patients' admission frequencies and FDLQI score. FDLQI score was also significantly affected by the Autoimmune Bullous Skin Disorder Intensity Score of patients' disease severity. The QoL of patients and their caregivers showed a significant positive correlation.
Conclusion: The QoL of patients and their families are impaired significantly, and is considerably prominent in the mucocutaneous phenotype of PV and more severe forms.
Limitation: Pemphigus Disease Area Index (PDAI) and Autoimmune Bullous Disease QoL (ABQoL) were not used in this study.

Introduction

Pemphigus vulgaris (PV) is a rare but seriously disabling disorder of the skin and mucous membranes. PV typically presents with painful and nonhealing oral erosions, followed by cutaneous blisters that rupture easily, resulting in burning superficial erosions. Owing to both the nature of the disease and the prolonged treatment needed, PV gravely impacts the quality of life (QoL) of patients (Ghodsi et al., 2012; Mayrshofer et al., 2005; Paradisi et al., 2009; Tabolli et al., 2008; Terrab et al., 2005). Patients with PV have been shown to also suffer from anxiety and depression (Arbabi et al., 2011; Ghodsi et al., 2012). Patients often rely heavily on support from family members/partners to overcome the physical and psychosocial burden.

Certain dermatologic disorders have also been shown to adversely affect the QoL of patients' family members (Bin Saif et al., 2013; Sampogna et al., 2013). The aim of the present study was to identify the level and specific domains in which the lives of family members of patients with PV are affected by the disease. We also sought to identify those at a greater risk of impairment and examine the correlation between family member and patient QoL.

* Corresponding author.
E-mail address: ghodsisz@tums.ac.ir (S.Z. Ghodsi).

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Methods

Patients with PV presenting to the Autoimmune Bullous Diseases Research Center at Razi Hospital in Tehran, Iran between 2015 and 2016 were included in the study, which was approved by the ethics committee of the Tehran University of Medical Sciences. A diagnosis of PV was confirmed by clinical features, pathology and direct immunofluorescent findings, and antidesmoglein antibodies. Patients and their family members acting as caregivers (age >18 years) were enrolled in the study. Patients with other concomitant skin diseases, medical and psychological/mental problems, and who had severe comorbidities that might influence patient judgment or QoL, as well as those not willing to participate in the study were excluded.

A questionnaire containing demographic (age, sex, job, marital status, and level of education) and clinical data was filled out for each patient. The demographic data of caregivers were also recorded. To calculate disease severity, the Autoimmune Bullous Skin Disorder Intensity Score (ABSIS; Pfütze et al., 2007) was used. The Persian version of the Dermatology Life Quality Index (DLQI; Aghaei et al., 2005) questionnaire was used to evaluate the QoL of patients and the Family Dermatology Life Quality Index (FDLQI; Safizadeh et al., 2014) to evaluate the QoL of caregivers.

Autoimmune Bullous Skin Disorder Intensity Score

The skin and mucosa are assessed by the ABSIS (Pfütze et al., 2007). The skin score focuses on two clinical criteria: extent of affected area and quality of skin lesions. The extent of the body surface area (in percentage; rule of nine) is multiplied with a weighting factor defined as 1.5 for erosive, exudative lesions, blisters and/or positive Nikolsky's sign; 1 for erosive, dry lesions; and 0.5 for reepithelialized lesions (excluding postinflammatory erythema and/or hyperpigmentation).

For the evaluation of oral mucosal involvement, both the extent and severity of oral lesions are considered. The extent is obtained by assessing 11 distinct anatomical sites: upper and lower gingival mucosa, upper and lower lip mucosa, left and right buccal mucosa, tongue, floor of the mouth, hard and soft palate, and the pharynx. The presence or absence of any lesion at all these sites is rated. The second mucosal score's severity is based on the assessment of the severity of symptoms and assessed by the reported dysphagia induced by different liquid and solid foods of increasing consistency.

Dermatology Life Quality Index

The DLQI (Aghaei et al., 2005) questionnaire consists of 10 questions, each referring to the previous 7 days. The questions are categorized into six heading items: Symptoms and feelings (questions 1 and 2), daily activities (questions 3 and 4), leisure (questions 5 and 6), personal relationships (questions 8 and 9), work and school (question 7), and treatment (question 10). Each item is scored from 0 to 3, and scores are added to yield a total DLQI of 0 to 30. Higher scores mean greater impairment of the patient's QoL.

Family Dermatology Life Quality Index

The FDLQI (Safizadeh et al., 2014) is a dermatology-specific instrument that measures the adverse impact on the health-related QoL of family members of patients with skin disease. The FDLQI consists of 10 items with possible answers on a 4-point scale: not at all/not applicable, a little, quite a lot, and very much. The items concern the impact of a patient's skin disease on different aspects of the family caregivers' QoL (emotional and physical wellbeing, relationships, social life, leisure activities, burden of care, impact on job/study, housework, and expenditure). The time frame of reference for items concerns the last 1 month. The scores of individual items (0–3) are added to give a total score that ranges from 0 to 30. A higher score indicates greater impairment of QoL.

Data were analyzed using SPSS software, version 25. Descriptive statistics for quantitative variables were presented as mean ± standard deviation. The significance of differences was assessed using an independent t test for continuous variables and χ^2 test for categorical variables. An analysis of variance with a post hoc analysis was used to determine significance between the groups. A Spearman correlation coefficient was used to assess the correlation between two quantitative variables. Statistical significance was set at $p < .05$.

Results

A total of 118 patients and one of their family members as caregivers were enrolled in this study (118 patients and 118 caregivers). The mean age of patients was 43.14 ± 12.5 years, and 90 patients (76.3%) were women. The demographic data are presented in Table 1. Eighty-one patients (68.6%) had the mucocutaneous phenotype and 37 cases (31.4%) the mucosal type. ABSIS scores, treatment modalities, number of exacerbations, and admission frequencies are shown in Table 2.

The DLQI score was 10.1 ± 7.1 with a range of 0 to 29 in patients. There was no statistically significant relationship with DLQI and sex, age, education, job, marital status, disease duration, type of treatment, relapse, and admission frequency. Although the DLQI score was higher in patients with a disease duration of <6 months, the difference was not significant. The DLQI score was higher in patients with the mucocutaneous phenotype (11.8 ± 7.5) than those with the mucosal phenotype (6.4 ± 4.9; $p < .001$). QoL was significantly affected by disease severity ($p < .001$; $r = .375$; Table 3). As shown in Fig. 1, patients' QoL was mostly affected in work/school, social leisure, and embarrassment items. Considering

Table 1
Demographic data of 118 patients with pemphigus disease and their caregivers.

	Patients	Caregivers
Sex, n (%)		
Male	28 (23.7)	51 (43.2)
Female	90 (76.3)	67 (56.8)
Age (y, mean ± SD)	43.14 ± 12.5	39.7 ± 9.6
(y, age range)	21–74	19–65
Education		
Illiterate	13 (11)	4 (3.3)
Undergraduate	43 (36.4)	34 (28.8)
Diploma	45 (38.1)	42 (35.5)
Postgraduate	17 (14.4)	38 (32.2)
Marital status		
Single	8 (6.7)	16 (13.5)
Married	103 (87.2)	102 (86.4)
Divorced	1 (0.8)	0 (0)
Widowed	6 (5)	0 (0)
Occupational status		
Unemployed	11 (9.3)	13 (11)
Employed	72 (61)	22 (18.6)
Housewife	24 (20.3)	66 (55.9)
Retired	9 (7.6)	9 (7.6)
Relation to the patient		
Spouse		79 (66.9)
Parents		5 (4.2)
Child		25 (21.1)
Sibling		8 (6.7)

SD, standard deviation.

Table 2
Clinical data of 118 patients with pemphigus.

	Patients, n (%)
Pemphigus type	
Mucocutaneous	81 (68.6)
Mucosal	37 (31.4)
Disease duration, mean ± SD	43.6 ± 45 months
Treatment regimens	
Prednisolone	27 (22.9)
Prednisolone + azathioprine	34 (18.8)
Prednisolone + mycophenolate mofetil	18 (15.3)
Prednisolone + rituximab	16 (13.6)
Prednisolone + methotrexate	13 (11)
Other	10 (8.4)
Number of relapses, mean ± SD	2 ± 2.25
Number of admissions, mean ± SD (range)	1 ± 1 (0–6)
ABSIS score, mean ± SD	
Mucocutaneous	16.9 ± 21.15
Mucosal	18 ± 16.11

ABSIS, Autoimmune Bullous Skin Disorder Intensity Score; SD, standard deviation.

Table 3
DLQI and FDLQI scores relation to demographic data.

	DLQI (patients)	FDLQI (caregivers)
Sex		
Male	11.9 ± 7.8	12.8 ± 6
Female	9.56 ± 6.9	13.4 ± 7.4
p-value	.165	.626*
Age		
p-value	.94	**0.008***
r	−.007	.24
Education, mean ± SD		
Under diploma	10.4 ± 6.5	14.8 ± 7
Diploma	10.2 ± 8.4	13.2 ± 6.6
Graduated	8.4 ± 6.6	11.1 ± 7.1
p-value	.341	.104
Marital status, mean ± SD		
Married	10.1 ± 7.3	13.6 ± 7
Unmarried	10 ± 7	9.6 ± 6.3
p-value	.976	**.03**
Occupational status		
With income	10.9 ± 7.6	12.5 ± 6.8
Without income	9.7 ± 7	14.1 ± 7.3
p-value	.437	.258
Disease duration		
p-value	.78	.62
r	−.02	−.045
Relapse frequencies		
p-value	.06	.34
r	.09	.17
Admission frequencies		
p-value	.52	**.001**
r	.06	.3

DLQI, Dermatology Life Quality Index; FDLQI, Family Dermatology Life Quality Index; SD, standard deviation.
* No significant relation between age and sex of the patients and FDLQI score.

the possible answers to the questions as nothing, a little, a lot, and too much, the most frequent answer was too much for the work/school, social leisure, and embarrassment items. Sex and sport were the least affected items with more answers noting nothing (Fig. 1).

Seventy-nine caregivers were the spouse of the patient, five were parents, 25 were children, and 8 were siblings. The FDLQI score was 13 ± 7 with a range of 0 to 30 in the caregivers. The FDLQI score was significantly higher in older caregivers ($p < .008$; $r = .243$). Married caregivers were more affected than those who

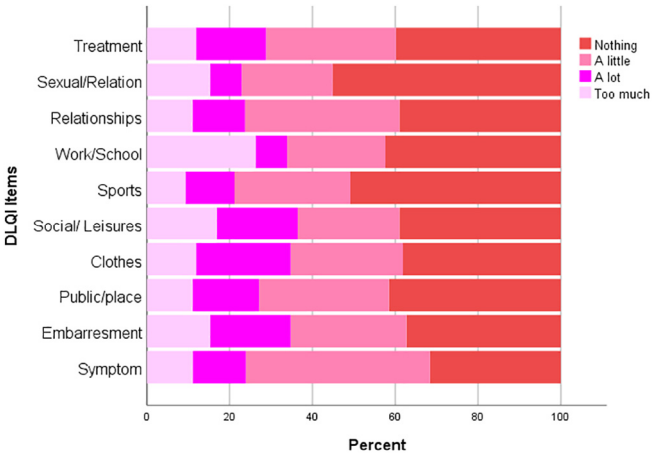

Fig. 1. Frequency of answers to the 10 questions of DLQI in 118 pemphigus patients.

were single (13.6 ± 7 vs. 9.6 ± 6.3; $p = .03$). FDLQI scores were not significantly influenced by caregivers' sex, education, job and patient disease duration, type of treatments, and relapse frequency. There was a positive correlation between patient admission frequencies and FDLQI score ($p = .009$; $r = .241$). The FDLQI score was also significantly affected by the ABSIS score of patients' disease severity ($p = .002$; $r = .345$). As shown in Fig. 2, caregivers' QoL was mostly affected in emotional, burden of care, and expenditure items. Considering the possible answers to the questions as not at all, a little, quite a lot, and very much, the majority of caregivers answered very much to emotional, burden of care, and expenditure but social life was the least important with most answer noting not at all (Fig. 2). The QoL of patients and their caregivers showed a significant positive correlation ($p < .0001$; $r = .525$; Fig. 3).

Discussion

The most important finding of this study is the considerable burden of PV on the QoL of patients and their families. Impaired QoL in patients with PV is expected and has been previously reported (Arbabi et al., 2011; Bin Saif et al., 2013; Ghodsi et al., 2012; Mayrshofer et al., 2005; Paradisi et al, 2009; Tabolli et al., 2008; Terrab et al., 2005), but the number of studies on their families' QoL is limited in the literature (Sajedianfard et al., 2019).

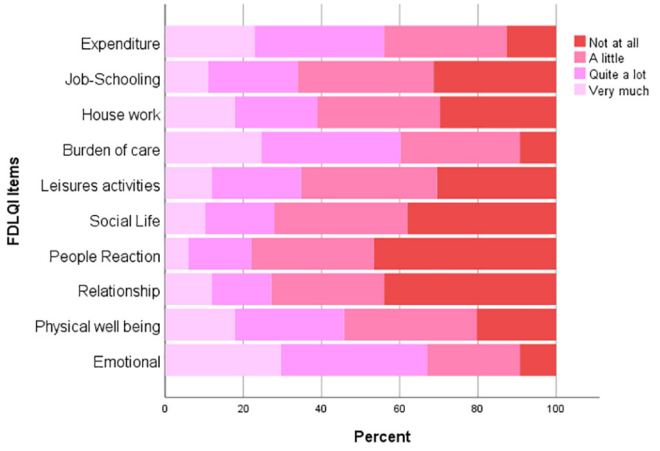

Fig. 2. Frequencies of answer to the 10 questions of FDLQI in 118 caregivers.

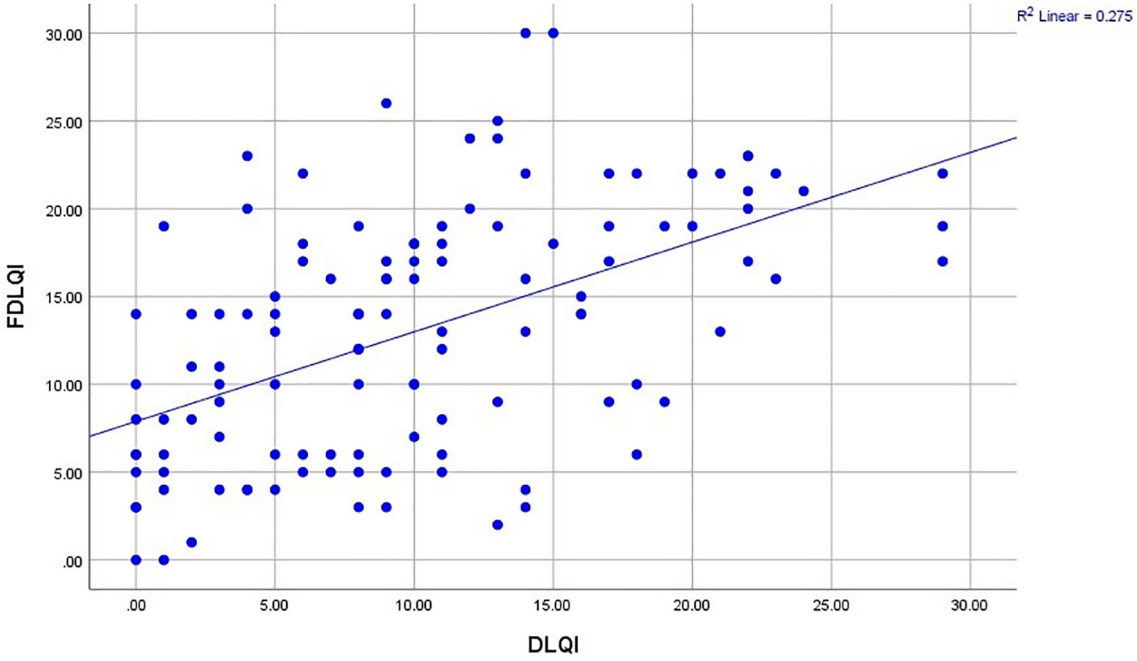

Fig. 3. Correlation between DLQI and FDLQI in 118 pemphigus patients and their caregivers.

In the present study, DLQI was 10.1 ± 7.1, showing the considerable impact of the disease on patients' life. Most patients (58.5%) displayed moderate-to-severe impairment of their QoL. However, age, sex, education, occupation, marital status, duration of disease, relapse, hospitalization frequency, and type of treatment received for the disease did not affect the QoL. What can significantly change a patient's QoL is the greater severity of the disease and the clinical type of PV (mucocutaneous vs. mucosal). The presence of skin involvement, probably because of the unpleasant appearance and a sense of embarrassment and discomfort, as well as the physical burden and care required to treat the lesions make the patient feel a lower quality level in different aspects of life. This finding was previously supported by Ghodsi et al. (2012).

Penha et al. (2015) showed that the QoL of patients with PV is more impaired than with other skin diseases (DLQI = 16) and the greater impact was related to symptoms and feelings, as well as daily and leisure activities. As confirmed by these studies, the QoL in patients with PV is impaired and varies with the type of disease and its intensity. Paying attention to this aspect in patients' treatment can be valuable in improving the QoL.

By considering different items in the DLQI questions in the present study, the mostly affected items are work/school (daily activities), social leisure, and embarrassment (symptoms and feelings). Ghodsi et al. (2012) reported previously only slightly different results; these items were symptoms and feelings, daily activities and social leisure. It seems that emotional and social parts of the patients' life is considerably affected.

This considerable impact of the disease can cause the emotional and physical dependency of patients on their family and affect the families/caregivers' QoL. Our study showed that >80% of caregivers reported moderate-to-severe impairment in their QoL, which indicates that the QoL in family members of patients with PV was also severely impaired (FDLQI: 13 ± 7). This impact was prominent in the emotional, burden of care, and expenditure dimensions. There was a positive correlation between FDLQI score and admission frequencies and severity of the disease (ABSIS score).

To the best of our knowledge, only one study has been reported to use the FDLQI questionnaire for 70 caregivers of patients with PV. Sajedianfard et al. (2019) reported a higher FDLQI score (i.e., poorer quality of life) if the patient was male, older, and had a shorter disease duration, fewer disease recurrences, and less-educated caregivers. There was no mention about disease severity or admission frequencies in this study, and the researchers did not study patients' QoL; therefore, the correlation between FLDQI and patients' QoL was not assessed. According to our study, caregiver QoL was poorer in patients with <6 months and >6 years disease duration, but the difference was not significant. There was also no significant association between patients or their families' education level and disease recurrences and FDLQI score.

However, FDLQI scores were higher in older caregivers and married ones. Older people may have more health conditions and therefore more trouble caring for a patient. Married couples also have more life problems and issues than single ones, and a spouse might likely be closer to the patient and therefore more impaired in QoL than other caregivers. On the other hand, factors related to the disease that affected the QoL of caregivers (per the FDLQI scores) were the number of hospitalizations, clinical type of pemphigus (mucocutaneous vs. mucosal), and severity of the disease. PV skin lesions are annoying both to the patient and their family. A study of the FDLQI details revealed that some aspects were more damaged. More importantly, PV affected the emotional aspect of caregivers. The difficulties of caring for a patient and the expenditures of treatment are other important issues.

In another study by Barsa et al. (2007) on family QoL in patients with different skin diseases, families reported emotional and caring aspects for the patient as the most important burden. The strong relationship between DLQI and FDLQI is another important finding of the present study. In other words, any action or activity taken to improve the QoL of patients may increase the QoL of the patient's family. On the contrary, factors (e.g., severity of disease) that keep patients' QoL low can impair family members' QoL considerably.

In our study, ABSIS was used to calculate disease severity and the DLQI/FDLQI to evaluate the QoL of patients/caregivers. Currently, the Pemphigus Disease Area Index and Autoimmune Bullous Disease QoL may be more acceptable to calculate disease

severity and QoL, respectively (Krain et al., 2019). At the time of the study (2015–2016), we were using either ABSIS or the Pemphigus Disease Area Index for research purposes, but because there was a subjective component in ABSIS we used this score in our study. Moreover, the Persian version of Autoimmune Bullous Disease QoL that was published recently (Teimourpour et al., 2020) has not been validated yet.

Conclusion

The QoLs of patients and their families are impaired significantly. The greater the severity of the disease and the clinical type of pemphigus (mucocutaneous vs mucosal) can significantly change a patient's QoL. Among caregivers, being married and of older age may lead to a poorer QoL. In addition, the number of hospitalizations, clinical type of pemphigus (mucocutaneous vs. mucosal), and severity of the pemphigus are disease-related factors that can negatively affect the QoL of caregivers.

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Conflicts of Interest

There is no conflict of interest to declare.

Study Approval

The author(s) confirm that any aspect of the work covered in this manuscript that has involved human patients has been conducted with the ethical approval of all relevant bodies.

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