CLINICAL REPORT

Health-related Quality of Life in Patients with Psoriasis and Atopic Dermatitis Measured with SF-36, DLQI and a Subjective Measure of Disease Activity

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The impact of skin diseases on health-related quality of life is considerable. It is important to quantify the patient's perspective of the severity of their disease. Health-related quality of life was measured in 366 patients with skin diseases attending the dermatology outpatient clinic in Uppsala, Sweden, from November 1996 to December 1997, with 1 generic (SF-36) and 1 disease-specific (DLQI) health-related quality of life instrument, and a subjective measure of disease activity. The SF-36 mean scores were below those of the age- and gender-matched general population in Sweden. No difference in health-related quality of life was found between men and women or between patients with atopic dermatitis and psoriatic patients. However, patients with psoriatic arthritis had significantly poorer health-related quality of life than both patients with atopic dermatitis and psoriatic patients. The estimated correlations between the instruments were in the expected direction and mostly significant. The results confirm that skin diseases have an adverse impact on patients' health-related quality of life. *Key words: skin diseases; health-related quality of life; outpatient.*

Psoriasis and atopic dermatitis (AD) are chronic relapsing skin diseases. The prevalence of psoriasis in Scandinavia is between 2 and 3% (1). Approximately 50% of those who develop psoriasis do so before the age of 25 years, and about 20–40% of psoriatic patients develop inflammation of the joints (psoriatic arthritis, PsA). Most patients with AD have an onset before 7 years of age, but the healing rate is considerable, leading to an adult prevalence of approximately 2%.

The consequences of having a skin disease may be more profound concerning the patient's health-related quality of life (HRQoL) than the discomfort of itching and skin lesions (2–7). Skin diseases are associated with considerable disability (3, 8–10). Psoriatic patients may feel stigmatized by their disease, and patients with AD are often anxious and have problems dealing with anger (8, 9, 11). Although not life-threatening, skin diseases are likely to have psychological and social implications for the patient (4, 12, 13). Studies have shown that the degree of disability is not always related to clinical severity (14–19). Therefore it is important to quantify the impact of skin diseases on patients' HRQoL to obtain the complete picture (2, 10, 20, 21).

HRQoL encompasses physical, social and psychological well-being (22). Generic HRQoL instruments, e.g. the Short-Form 36 (SF-36) (23), measure aspects of health important to everyone, and thus allow comparisons between different diseases. Disease-specific HRQoL instruments, e.g. the Psoriasis Disability Index (PDI) (15), are specifically designed for a particular patient population. The dermatology-specific measure, the Dermatology Life Quality Index (DLQI), can be used across skin diseases (7).

The aim of this study was to measure HRQoL in patients with psoriasis and AD, with the SF-36, the DLQI and a subjective measure of disease activity, and to estimate the correlations between these measures. The study was based on 132 patients with AD and 234 psoriatic patients.

MATERIAL AND METHODS

Study population

Patients with the diagnosis of psoriasis or AD and who had attended the dermatology outpatient clinic at the University Hospital in Uppsala during 1995, 1996 or 1997 were included in the study. They were contacted either by telephone or when visiting the clinic and were invited to participate in the study. Fourteen patients refused to participate in the survey. The final study population consisted of 132 patients with AD and 234 with psoriasis. The study was performed between November 1996 and December 1997.

Survey details

Ethical permission for this study was given by the Ethics Committee at the hospital. All interviews were conducted by 2 nurses at the clinic, who stressed the confidentiality and the anonymity of the resulting data. The survey consisted of a self-administered questionnaire which included sociodemographic questions, questions about psoriasis and AD and current treatment, questions about concomitant diseases (1 dichotomous yes/no and 1 open-ended question), a subjective measure of disease activity, the psychometric health-related quality of life instruments; DLQI and SF-36 and 3 preference-based methods.

Health-related quality of life assessment

HRQoL was assessed with 1 generic (SF-36) and 1 dermatology-specific instrument (DLQI). The Short Form (SF-36) is a self-administered, multidimensional, widely used and well-validated generic instrument (23). The SF-36 is based on work initially performed within the RAND Corporation's Health Insurance

Experiment in the United States and continued within the Medical Outcome Study (MOS), resulting in the release of the MOS SF-36 standard version in 1990. Questions pertain to the individuals typical day, the past four weeks and experiences in general. The SF-36 measures HRQoL with 36 items, along 8 dimensions and 1 Physical (PCS-36) and 1 Mental (MCS-36) Component Summary score. The 8 different dimensions are: 1) Physical function: limitations in physical activities because of health problems; 2) Role–physical function: limitations in usual role activities because of physical health problems; 3) Bodily pain; 4) General health perceptions; 5) Vitality: energy and fatigue; 6) Social function: limitations in social activities because of physical or emotional problems; 7) Role–emotional function: limitations in usual role activities because of emotional health problems; and 8) Mental health. The 8 dimensions range in score from 0 to 100, with higher scores indicating higher levels of function and/or better health. The SF-36 also includes a general health rating item, which asks respondents about the amount of change in their health in general over a 1-year period. This item is not used to score any of the scales. Norms allow individual scores and group averages to be interpreted according to where they lie in the distribution of scores for a general population. Norm data have been estimated for the Swedish general non-institutionalized adult population (24).

The DLQI was developed by Finlay & Kahn in 1994, as a dermatology-specific measure intended to be simple, compact and applicable to patients with any skin disease (7). The DLQI is a questionnaire that measures how much a skin problem has affected the life of the patient over the previous 7 days. It consists of 10 items, 6 dimensions and 1 overall summary score. Each question has 4 alternative answers: "not at all", "a little", "a lot" or "very much", with scores of 0, 1, 2 and 3, respectively. The overall summary score aggregates the score of each item and ranges between 0 (the best score) and 30 (the worst score). The 6 dimensions are: 1) Symptoms and feelings; 2) Daily activities; 3) Leisure; 4) Work and school; 5) Personal relationships; and 6) Treatment.

Subjective measures of disease activity

Three horizontal visual analogue scales (VAS) were used to assess the respondent's subjective measure of disease activity. The first question assessed the respondent's disease activity at the time of the survey, with anchors of calm (at 0) and active (at 100). The second question assessed how the respondent feels when the disease is most active, with anchors of poor (at 0) and excellent (at 100). The last question assessed how the respondent feels when the disease is least active, with anchors of poor (at 0) and excellent (at 100).

Statistical methods

The non-parametric Mann–Whitney and Kruskal–Wallis tests were used to test statistical significance between patient groups, gender and age groups for SF-36, DLQI and the subjective measure of disease activity. Comparisons were made among all patients with psoriasis and AD and psoriatic patients with and without PsA. Spearman's correlation coefficients were used to analyse the relationship between the HRQoL instruments and the subjective measure of disease activity. Multivariate regression analysis was also carried out, with PCS, MCS and DLQI as dependent variables controlling for age, gender, diagnosis (only psoriasis, PsA and AD) and concomitant diseases (25). All statistical tests were carried out at the 5% level.

Because the age and gender distribution differed between the skin patients and the Swedish norm data, age- and gender-adjusted SF-36 scores were calculated to reflect the age and sex composition of Swedish norm data, using a direct standardization method (26). The adjusted scores for the skin patients indicate the expected health status, if they had the same age and gender distribution as norm data. The normal test method was then used to test for statistical significance between the adjusted scores and the mean scores for the Swedish norm data (27).

RESULTS

The characteristics of the survey respondents are given in Table I. The mean values for the 3 subjective measures of disease activity show that VAS for disease activity today and how the patient feels today did not differ significantly between patients with psoriasis and patients with AD. However, patients with AD felt worse when their disease was most active and felt better when their disease was least active compared with psoriatic patients. The patients with PsA had a worse HRQoL than the other psoriatic patients according to all VAS, although the difference for disease activity today was not significant.

The Spearman's correlation coefficients between the data of SF-36 and the DLQI showed significant correlations ranging between −0.15 and −0.41. All SF-36 dimensions were significantly correlated with all measures of disease activity ranging between 0.182 and 0.526. The DLQI correlations with VAS were also significant in most cases, ranging between −0.005 and 0.595.

The mean scores for the 8 SF-36 dimensions and the 2 summary scores are given in Table II. All age- and gender-adjusted SF-36 mean scores for the skin patients were below Swedish norm data mean scores. The DLQI scores for patients with psoriasis and AD are given in Table III. Since there were several indications in the results proposing age and gender as confounding factors, multivariate analyses were performed to control for these factors. Diagnosis and concomitant diseases were also considered to be potential confounding factors. A linear regression analysis was performed with DLQI, PCS and MCS as dependent variables and age, gender, diagnosis and concomitant diseases as independent variables.

The multivariate results confirm many of the univariate results shown in Tables II and III. In both types of analysis there was no significant difference on the SF-36 between patients with AD and patients with psoriasis (excluding patients with PsA). However, the DLQI scores showing poorer HRQoL for patients with AD compared with psoriatic patients, were no longer significant when controlling for confounding factors. In both the univariate and multivariate analyses HRQoL was significantly worse for patients with PsA than for the other psoriatic patients on the SF-36. The result for the DLQI was in the same direction, but did not quite reach statistical significance when controlling for confounding factors. When defining the diagnosis group as having either psoriasis (including PsA) or atopic dermatitis there was a significant difference in HRQoL scores between the patient groups on PCS ($p = 0.048$) and on MCS ($p = 0.021$) in the multivariate analyses.

The linear regression analysis confirmed the trend of decreasing DLQI scores for the total group with higher age, indicating an improved HRQoL with age. However, the SF-36 physical summary scale score for the total group no longer decreased significantly with age in the regression analysis. The SF-36 mental summary scale score for the total group now showed a trend towards increasing HRQoL with age. In the univariate analyses the only effect of gender was seen on the DLQI summary score in the total group, where women had lower HRQoL than men. In all other analyses and when controlling for confounding factors there was no effect of gender. The presence of concomitant diseases led to a

Table I. *Characteristics of the survey respondents*

Variables	Psoriasis			Atopic dermatitis (*n*= 132)	Total (*n*= 366)
	Total (*n*= 234)	Without PsA (*n*= 154)	With PsA (*n*= 80)		
Duration of disease (years)[a]	18.39 ± 13.43	17.44 ± 13.18	20.22 ± 13.80	25.83 ± 15.23	21.05 ± 14.52
Concomitant diseases (%)	59	50	78	74	65
Age (years)[a]	49.87 ± 13.06	49.68 ± 13.87	50.24 ± 11.41	34.79 ± 12.01	44.43 ± 14.60
ω 29	0.08	0.09	0.05	0.39	0.19
30 – 39	0.15	0.14	0.16	0.31	0.21
40 – 49	0.25	0.26	0.22	0.14	0.21
50 – 59	0.25	0.18	0.38	0.14	0.21
> 60	0.29	0.33	0.19	0.02	0.18
Gender:					
Male	0.51	0.53	0.46	0.29	0.43
Female	0.49	0.47	0.54	0.71	0.57
Monthly income (SEK)[a]	13,825 ± 6,742	14,444 ± 6,647	12,627 ± 6,804	12, 022 ± 6,393	13,175 ± 6,666
Civil status (%):					
Married/cohabiting, widowed	71	73	68	66	70
Single, divorced	29	27	32	34	30
Education (%):					
Compulsory school	40	37	47	15	31
High school	40	40	38	49	43
University	20	23	15	36	26
Drug use (%):					
Emollients	83	83	84	97	88
Topical steroids	62	63	60	87	71
Dithranol	5	4	6	0	3
Coal tar	3	3	3	0	2
Calcipotriol	60	61	59	1	39
Active therapy[b]	88	88	88	87	88
Ultraviolet radiation	54	53	56	36	48
Systemic therapy	28	19	46	14	23
Injections	3	1	6	1	2
Other	19	16	25	23	21

[a]Mean ± SD.
[b]Combination of emollients, topical steroids, dithranol, coal tar preparations and calcipotriol.
PsA = psoriatic arthritis.

worse HRQoL according to all of the regression equations, but the effect was only significant for the physical summary scale of SF-36.

DISCUSSION

The study of the impact of skin diseases on HRQoL is still a relatively new area of interest (28). One strategy for interpreting HRQoL scores is to compare generic scores from the study population with the average values for a general population. This is the strength of using generic instruments, compared with disease-specific instruments where the questions may not be relevant to a healthy population. Therefore, no norm data exist for the DLQI. Nevertheless, a study assessed the DLQI scores of healthy controls, showing a very low mean total DLQI score of approximately 0.5 (7). However, it is not self-evident that there is a difference in HRQoL between patients and the normal population, and norm-based comparisons help to paint a picture of the potential differences and their magnitude. The present study confirms that patients with skin diseases have lower scores on the SF-36 than do a general population (24, 29).

The DLQI scores found in this study were somewhat lower than in other studies (7, 20, 30). The severity of the disease might explain some of the differences. Previous studies have, however, found poor correlations between clinical severity and quality of life (15–19).

HRQoL assessed with the DLQI and the SF-36 mental summary scale was found to increase with age. That skin diseases may have a greater adverse effect on HRQoL at younger ages has been shown in some studies (19, 31, 32), while others found no association with age (18). The present study found no gender effect on HRQoL, which is in line with other studies (18). Other studies have found that female psoriatic patients feel more stress and worry than male patients, and that they have a lower quality of life (19, 30, 33). Gupta also found that men face greater work-related stress as a result of their psoriasis (32).

No significant differences were found in the overall HRQoL between psoriatic patients and patients with AD, when separating patients with only psoriasis from those with PsA (after controlling for age, gender and concomitant diseases). Patients with PsA had significantly lower HRQoL than other psoriatic patients and patients with AD. Previous studies found AD patients to have poorer HRQoL than patients with

Table II. *Mean (±SD) scores for the 8 dimensions of the SF-36 and the SF-36 Physical and Mental Component Summary scales, for patients with psoriasis and atopic dermatitis*

Variables	Psoriasis			Atopic dermatitis (n= 132)	Total (n= 366)
	Total (n= 234)	Without PsA (n= 154)	With PsA (n= 80)		
PF (0–100)[a]	77.2 ± 25.3	85.7 ± 19.2	61.0 ± 27.6*	85.1 ± 19.0*	80.1 ± 23.5
RP (0–100)[a]	64.5 ± 41.3	75.2 ± 35.7	44.1 ± 43.8*	66.7 ± 39.2[ns]	65.3 ± 40.5
BP (0–100)[a]	62.7 ± 29.8	73.2 ± 26.4	42.4 ± 25.5*	66.2 ± 29.9[ns]	63.9 ± 29.9
GH (0–100)[a]	60.7 ± 23.9	67.1 ± 22.2	48.3 ± 22.2*	62.1 ± 24.2[ns]	61.2 ± 24.0
VT (0–100)[a]	54.7 ± 24.1	60.6 ± 21.2	43.4 ± 25.5*	57.0 ± 21.6[ns]	55.5 ± 23.2
SF (0–100)[a]	80.8 ± 25.1	85.9 ± 20.9	71.1 ± 29.5*	81.0 ± 23.4[ns]	80.9 ± 24.5
RE (0–100)[a]	67.0 ± 42.6	76.2 ± 37.7	49.2 ± 45.9*	74.0 ± 37.4[ns]	69.5 ± 40.9
MH (0–100)[a]	71.1 ± 19.8	73.8 ± 18.6	65.8 ± 21.0*	73.2 ± 19.0[ns]	71.8 ± 19.5
PCS[b]	44.7 ± 12.2	48.8 ± 10.2	36.7 ± 12.0*	46.5 ± 9.6[ns]	45.4 ± 11.4
MCS[b]	44.7 ± 11.9	46.2 ± 11.4	41.8 ± 12.4*	45.4 ± 11.9[ns]	45.0 ± 11.9

[a]0= worst and 100= best score.

[b]PCS= physical summary score; MCS= mental summary score; norm-based scored, i.e. each scale score is standardized to the same mean as the general Swedish population assigned to 50 with SD= 10.

*$p \omega$ 0.05, comparison between patients with psoriasis and psoriatic arthritis and between patients with psoriasis and atopic dermatitis within each dimension and for the summary scores. [ns]Not significant.

PsA= psoriatic arthritis. PF= physical function; RP= role–physical function; BP= bodily pain; GH= general health; VT= vitality; SF= social function; RE= role–emotional function; MH= mental health.

Table III. *Dermatology Life Quality Index (DLQI) mean (±SD) scores for patients with psoriasis and atopic dermatitis*

Variables	Psoriasis			Atopic dermatitis (n= 132)	Total (n= 366)
	Total (n= 234)	Without PsA (n= 154)	With PsA (n= 80)		
DLQI (0–30)[a]	5.93 ± 5.66	4.98 ± 4.94	7.76 ± 6.48*	7.31 ± 5.98*	6.43 ± 5.81
DLQI 1 (0–6)[a] Symptoms and feelings	2.00 ± 1.47	1.82 ± 1.42	2.35 ± 1.51*	2.34 ± 1.48*	2.12 ± 1.48
DLQI 2 (0–6)[a] Daily activities	1.11 ± 1.43	0.94 ± 1.29	1.44 ± 1.63*	1.29 ± 1.50[ns]	1.17 ± 1.46
DLQI 3 (0–6)[a] Leisure	0.95 ± 1.67	0.67 ± 1.32	1.50 ± 2.10*	1.10 ± 1.73[ns]	1.01 ± 1.69
DLQI 4 (0–3)[a] Work and school	0.52 ± 0.87	0.40 ± 0.72	0.75 ± 1.07*	0.98 ± 0.98*	0.69 ± 0.94
DLQI 5 (0–6)[a] Personal relationships	0.56 ± 1.20	0.42 ± 1.03	0.81 ± 1.45*	0.89 ± 1.50*	0.68 ± 1.33
DLQI 6 (0–3)[a] Treatment	0.79 ± 0.84	0.73 ± 0.78	0.91 ± 0.93[ns]	0.71 ± 0.72[ns]	0.76 ± 0.79

[a]The best score is assigned to 0 and the worst score to the highest value for the DLQI summary score as well as for the 6 DLQI dimensions.

*$p \omega$ 0.05, comparison between patients with psoriasis and psoriatic arthritis and between patients with psoriasis and atopic dermatitis for total DLQI and DLQI 1–6. [ns]Not significant. PsA= psoriatic arthritis.

psoriasis (7, 20). However, those studies did not use a multivariate approach and did not state whether they included PsA patients.

The correlations between the SF-36 and DLQI can be seen as a test of validity, i.e. how adequately the SF-36 captures areas of life for patients with skin diseases. The strongest correlations (>0.40) were found between the DLQI and the mental and social SF-36 scales, which is highly relevant since psychosocial domains have been shown to be very important for patients with skin diseases (16, 30). Other studies have also shown that DLQI is highly correlated with the SF-36 mental health scale (30). The correlations between the DLQI and SF-36 suggest that both instruments can yield important information about health-related quality of life in patients with skin diseases. This is further reinforced by the strong correlations between the SF-36 scales and the subjective measure of disease activity.

In conclusion, this study has confirmed that patients with skin diseases have poorer HRQoL than the general population. No differences were found between men and women or between AD and psoriatic patients. However, patients with PsA had significantly poorer HRQoL than both AD and psoriatic patients. Higher age seemed to be associated with higher HRQoL on the DLQI and the SF-36 mental summary scale. The dimensions of DLQI and SF-36 were significantly correlated with each other and the subjective measures of disease activity. The results suggest that SF-36 may be suitable for use in patients with skin diseases, as a complement to disease-specific measures.

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