

ORIGINAL ARTICLE

Clinical and Therapeutic Profile and Quality of Life of Patients With Seborrheic Dermatitis

J Peyrí,^a M Leonart,^b and the Spanish Group of the SEBDERM Study

^aServicio de Dermatología, Hospital Universitari de Bellvitge, L'Hospitalet de Llobregat, Barcelona, Spain

^bNovartis Farmacéutica SA, Barcelona, Spain

Abstract. *Introduction.* The clinical characteristics of seborrheic dermatitis (SD), therapeutic strategies employed in current clinical practice and impact on the quality of life in the Spanish population are described. *Methods.* An epidemiological, multicenter, transversal study in patients older than 16 years with seborrheic dermatitis. We evaluated the intensity of symptoms (scale 0-4), and impact on the quality of life by the Skindex-29 questionnaire (scale 0-100).

Results. Two thousand one hundred and fifty nine patients participated, the mean age was 43.6 years, 55 % were men and 42 % had a family history of seborrheic dermatitis. Diagnosis is usually carried out at a mean age of 33.7 years. The median number of outbreaks in the last year is three. The median duration of each outbreak is 14 days. The most involved areas are the face (88%) and scalp (70%). The mean intensities are as follows: scaling 1.9, erythema 1.89, pruritus 1.73, oily skin 1.52, and induration 0.87. Ninety-eight percent of patients report a trigger factor for outbreaks, namely stress/depression/fatigue (76%) and seasonal variation (44%). Acne is the most common concomitant disease (35%). The most common treatments are topical steroids (60%), imidazole antifungals (35%) and hydrating/nutritive products (31%). The mean Skindex-29 global score is 20.5.

Conclusions. The most common clinical profile of seborrheic dermatitis is a 40-year-old patient with facial/scalp involvement of mild to moderate intensity with a history of stress/depression/fatigue prior to the outbreak. The most common treatments in the daily clinical practice are topical steroids and imidazole antifungals. The impact of seborrheic dermatitis in the quality of life is low.

Key words: seborrheic dermatitis, Skindex-29, quality of life.

PERFIL CLÍNICO, TERAPÉUTICO Y CALIDAD DE VIDA DE LOS PACIENTES CON DERMATITIS SEBORREICA

Resumen. *Introducción.* Se describen las características clínicas de la dermatitis seborreica (DS), las estrategias terapéuticas empleadas en la práctica clínica habitual y el impacto en la calidad de vida de la población afectada en España.

Métodos. Estudio epidemiológico, multicéntrico, transversal en pacientes mayores de 16 años con DS. Se evaluaron la intensidad de los síntomas (escala 0-4) y el impacto en la calidad de vida mediante el cuestionario Skindex-29 (escala 0-100).

Resultados. Participaron 2.159 pacientes, con una edad media de 43,6 años, el 55% hombres y el 42% con antecedentes familiares de DS. El diagnóstico se realizó como media a los 33,7 años. La mediana de brotes en el último año es de 3. La duración mediana de cada brote es de 14 días. Las zonas más afectadas son la facial (88%) y el cuero cabelludo (70%). Las medias de las intensidades son: descamación 1,9, eritema 1,89, prurito 1,73, piel grasa 1,52, infiltración 0,87. El 98% de los pacientes refiere un factor desencadenante de los brotes, estrés/depresión/fatiga (76%) y estacionalidad (44%). La patología concomitante más común es el acné (35%). Los tratamientos más frecuentes son corticoides tópicos (60%), antimicóticos imidazólicos (35%) e hidratantes/nutritivos (31%). La puntuación global media del Skindex-29 es de 20,5.

Correspondence:

Jordi Peyrí Rey

Servicio de Dermatología

Hospital Universitari de Bellvitge

Feixa Llarga, s/n

08907 L'Hospitalet de Llobregat. Barcelona. Spain

E-mail: jpeyri@csub.scs.es

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Conclusiones. El perfil clínico mayoritario de la DS es un paciente de 40 años, con afectación facial/cuero cabelludo, intensidad leve-moderada, padeciendo un episodio de estrés/depresión/fatiga previo al brote. Los tratamientos más frecuentes, en la práctica clínica habitual, son corticoides tópicos y antimicóticos imidazólicos. El impacto de la DS sobre la calidad de vida es bajo.

Palabras clave: dermatitis seborreica, Skindex-29, calidad de vida.

Introduction

Seborrheic dermatitis is a chronic inflammatory cutaneous disease characterized by the presence of erythema and flaking of the skin in the affected areas. The lesions are mainly located in areas containing a larger number of sebaceous glands, such as the scalp, face (mid-facial region), and certain areas of the trunk, such as the mid-thoracic and interscapular areas and the area around the buttocks.

It affects around 1% to 3% of the immunocompetent adult population, with a higher prevalence in men than women.¹ Although it can appear at any age, the highest prevalence is observed in individuals aged 30 to 60 years and in the first 3 months of life in the infantile form of the disease.²

Clinically, the disease is characterized by erythema and flaking of the skin in the affected area. The lesions are well delimited, reddish, and covered with oily yellowish-white scales. On the scalp, in the milder form of the disease, the scales are small, dry, and whitish, and they detach easily and spontaneously in steady amounts. In the more severe form of the disease, plaques are observed that range in size from a few centimeters to areas covering a large part of the scalp; they are made up of thick dry scales. On the face they are found in the eyebrows, around the nose, at the edge of the scalp, and on the inner surface of the auricle. In the thorax, the lesions are rounded, well delimited, and reddish brown; they are located on the medial part of the chest and on the back, between the shoulder blades. All of these forms are associated with varying degrees of itching.

In adults, the course of seborrheic dermatitis involves periods of remission and exacerbation, irrespective of the treatments administered. Outbreaks are common under conditions of emotional stress, fatigue, and depression.³ While the disease rarely causes serious complications, it always leads to a marked esthetic deterioration that leads to emotional and social difficulties for the affected individual.

The etiology of seborrheic dermatitis is not fully understood but is known to involve various factors. Increased secretion by the sebaceous glands favors the development of microorganisms of the genus *Malassezia* (yeast-like fungi), which are responsible for the symptoms.⁴ It appears more frequently in patients with

neurological disorders such as Parkinson disease,⁵ in those suffering from depression,⁶ and in patients with AIDS.⁷ A diet rich in animal fats and lacking in vegetables, as well as alcohol consumption can also potentiate the appearance of lesions.⁸

Topical treatments are the first choice for seborrheic dermatitis. However, in exceptional cases it is necessary to resort to systemic drugs. The treatment will depend on the site and severity of the lesions and is intended to control the symptoms. Various drugs can currently be used to minimize the effects of this dermatologic disease.⁹ These include corticosteroids, antifungals, keratolytics, tar or pyrithione derivatives, and selenium sulfate. Many of these treatments have been tested as both monotherapy and in combination.

Seborrheic dermatitis is one of the most common conditions for which patients consult a dermatologist. However, to date, no epidemiological studies have been performed in Spain to assess the clinical characteristics (history, localization, severity of symptoms, and triggers) and the true impact of the disease in the Spanish population. The aim of this study was to describe both the clinical profile of patients aged more than 16 years with seborrheic dermatitis and the therapeutic strategies used for treatment of the disease in routine clinical practice, and also to assess its impact on the quality of life of affected individuals.

Patients and Methods

A multicenter cross-sectional epidemiologic study was performed in hospital and community dermatology clinics throughout Spain between April and October 2005. The study population included patients aged more than 16 years with diagnosis of seborrheic dermatitis involving any part of the body. A minimum age of 16 years was used in order to select postpubescent patients. All patients provided signed informed consent prior to inclusion in the study.

The severity of the seborrheic dermatitis lesions was evaluated using a semiquantitative scale of 0 to 4 for each of the symptoms (erythema, scaling, infiltration, oily skin, and pruritus), where a value of 0 corresponded to the

absence of symptoms, 1 to mild symptoms, 2 to moderate symptoms, 3 to severe symptoms, and the maximum value of 4 to very severe symptoms.

To assess the impact of the disease on the patients' quality of life we used the 29-item version of the Skindex dermatological questionnaire,^{10,11} which has been validated in Spanish patients.¹² The Skindex-29 questionnaire focuses on 3 dimensions: functioning (12 items), emotions (10 items), and symptoms (7 items). The following scoring system was used for all of the questions: never (0), rarely (1), sometimes (2), often (3), and always (4). Both the overall score obtained and the total score for each of the dimensions (emotions, functioning, and symptoms) were converted to a scale of 0 (no impact on quality of life) to 100 (maximum impact on quality of life) by linear transformation.

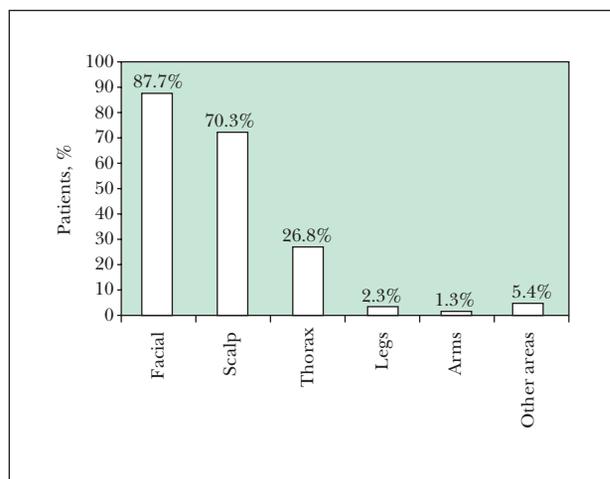


Figure 1. Site of seborrheic dermatitis (n = 2159).

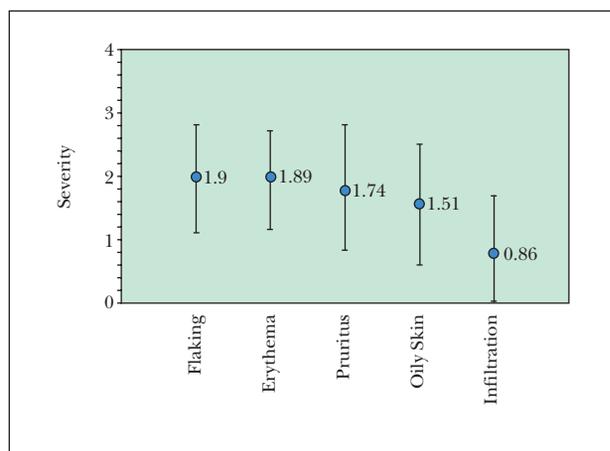


Figure 2. Assessment of seborrheic dermatitis according to the severity of the symptoms for the complete study population (0 = absence of symptoms, 1 = mild symptoms, 2 = moderate symptoms, 3 = severe symptoms, 4 = very severe symptoms).

The clinical characteristics of the disease and its impact on quality of life were analyzed for the complete study group and for subsets of patients aged 16 to 25, 26 to 40, 41 to 60, and more than 60 years.

Statistical analysis was performed using the statistical package SAS version 8.2. Descriptive variables (mean [SD] and median) were calculated for continuous variables and frequency tables were used to describe categorical or qualitative variables. Differences between percentages were analyzed by χ^2 test and differences between means by analysis of variance. Statistical significance was established at $P < .05$ in all statistical tests.

Results

A total of 2208 patients were recruited, of which 2159 (97.8%) were included in the study population. Forty-nine patients were excluded because they did not meet the selection criteria.

Clinical Characteristics of Seborrheic Dermatitis

The mean (SD) age of the patients was 43.59 (14.82) years, 52.2% were men, and 46.4% had an athletic build. A family history of seborrheic dermatitis was observed in 41.6% of the study population.

The mean age at diagnosis was 33.73 (15.20) years. Prior (incorrect) diagnosis of psoriasis, contact dermatitis, and atopic dermatitis had been obtained in 9.3%, 5.2%, and 10.3% of patients, respectively. The median time elapsed since diagnosis was 7 years, with a median of 3 outbreaks in the last year. The median length of each outbreak was 14 days in the full study group and 11.5 days in the subset of patients aged 41 to 60 years ($P < .05$). There were no statistically significant differences between age groups in terms of the number of outbreaks in the previous year.

Figure 1 shows the body areas affected by seborrheic dermatitis in the study population. The most commonly affected areas were the face (87.7% of the population) and scalp (70.3%), followed by the thorax (26.8%). Very few patients had involvement of other areas (2.3% had involvement of the legs, 1.3% the arms, and 5.4% other unspecified areas). The total was greater than 100% since more than one area could be affected in the same patient. The site of seborrheic dermatitis was unaffected by age.

The severity of the symptoms (erythema, flaking, infiltration, oily skin, and pruritus) for the complete study group is shown in Figure 2. The most severe symptoms (mean [SD] score) were flaking (1.90 [0.75]), erythema (1.89 [0.71]), pruritus (1.74 [0.92]), and oily skin

Table 1. Factors That Trigger Outbreaks According to Age Group

Trigger	Total	16-25 y	26-40 y	41-60 y	> 60 y	P
Stress/depression/fatigue	1607 (76.6%)	147 (69.7%)	587 (80.2%)	664 (78.9%)	209 (67.0%)	< .0001
Seasonal factors (wind, temperature changes, spring/summer/autumn/winter, etc)	935 (44.6%)	86 (40.8%)	325 (44.4%)	387 (46.0%)	137 (43.9%)	NS
Air conditioning, dry or damp conditions in the workplace	369 (17.6%)	29 (13.7%)	152 (20.8%)	164 (19.5%)	24 (7.7%)	< .0001
Changes in the use of personal hygiene products or cosmetics	353 (16.8%)	35 (16.6%)	129 (17.6%)	146 (17.3%)	43 (13.8%)	NS
Sun exposure	287 (13.7%)	29 (13.7%)	103 (14.1%)	111 (13.2%)	44 (14.1%)	NS
Changes in eating habits	253 (12.1%)	26 (12.3%)	86 (11.7%)	107 (12.7%)	34 (10.9%)	NS
Infections (Influenza, fever, etc)	184 (8.8%)	19 (9.0%)	68 (9.3%)	58 (6.9%)	39 (12.5%)	< .050
Medications	47 (2.2%)	2 (0.9%)	9 (1.2%)	14 (1.7%)	22 (7.1%)	< .0001

Abbreviation: NS, not significant.

(1.51 [0.90]), all with a median score of 2. The least severe symptom was infiltration (0.86 [0.85]), with a median score of 1. Significant differences in the severity of symptoms according to age group were observed for all symptoms (especially erythema, $P < .0001$) except flaking. Patients aged over 60 years displayed significantly more severe erythema (2.0 [0.7], $P < .0001$), infiltration (0.95 [0.88], $P < .05$), and pruritus (1.78 [0.96], $P < .05$), and less severe oily skin (1.4 [0.96], $P < .05$).

The possible factors that triggered outbreaks in the study population are shown in Table 1 (patients were asked to indicate only those factors that had been present prior to the outbreak). A factor that triggered outbreaks was reported by 98.4% of the study population: stress/depression/fatigue was the most common factor (76.4%, $P < .0001$), followed by seasonal changes (44.3%), exposure to air conditioning (17.7%), changes in personal hygiene products (16.7%), and exposure to the sun (13.7%). Winter was reported as a trigger by 7% of patients, whereas only 2% considered summer as the season that triggered outbreaks. Other triggers were reported by 6.5% of patients, the most common being menstruation (10%) and alcohol consumption (8.6%). Alcohol consumption was reported by 53.9% of patients, the majority reporting light (64.9%) or moderate consumption (29.3%). Both infectious diseases and use of medication were significantly more common as a trigger factor in patients older than 60 years (12.5% [$P < .05$] and 7.1% [$P < .0001$], respectively), while air conditioning was

considered to be a trigger ($P < .0001$) in patients aged 26 to 40 years (20.8%) and 41 to 60 years (19.5%).

Concomitant skin disease was reported as having been present in 77% of patients. The most common was acne (34.6% of the population). Psoriasis was present in 8.0% of the patients. Some form of viral disease was presented by 44.4% of patients (herpes in 26.4% and warts in 23.7%), 22% had bacterial infections (pityriasis versicolor in 13.4%), and 29.2% reported cutaneous mycosis (folliculitis in 17.7%). Finally, 7.9% of the patients suffered depression.

Treatment of Seborrheic Dermatitis in Clinical Practice

Some sort of treatment for seborrheic dermatitis was used by 94.9% of the patients at the time of the visit. The most frequently used topical treatments (Table 2) were corticosteroids (59.9%), followed by imidazole antimycotics (35.1%), hydrating/emollient/nutritive treatments (30.7%), and topical calcineurin inhibitors (27.2%). The use of other pharmacological treatments for seborrheic dermatitis was reported in 5.1% of patients, the most common being systemic antihistamines (1.16%). Only 1.0% of patients reported nonpharmacological treatments for seborrheic dermatitis (mainly natural remedies, 0.54%).

Table 2. Treatments for Seborrheic Dermatitis (n = 2159)

Treatment	No. (%)
Topical corticosteroids	1.293 (59.9%)
Imidazole antimycotics	758 (35.1%)
Hydrating/emollient/nutritive treatments	663 (30.7%)
Topical calcineurin inhibitors	588 (27.2%)
Pyrithione derivatives	389 (18.0%)
Tar derivatives	263 (12.2%)
Keratolytics	201 (9.3%)
Selenium sulfate	165 (7.6%)
Vitamin D derivatives	44 (2.0%)
Other pharmacological treatments	110 (5.1%)
Other nonpharmacological treatments	22 (1.0%)

Each patient received a mean of 2.09 (1.31) treatments. The most common treatment combinations were topical corticosteroids with imidazole antimycotics (12.8%) and topical corticosteroids with hydrating/emollient/nutritive treatments (7.5%). The treatments most frequently provided simultaneously for noncutaneous diseases were antidepressants (2.1%) and anxiolytics (2.0%).

Impact of Seborrheic Dermatitis on Patient Quality of Life

The overall score on the Skindex-29 questionnaire in the complete study population (n = 2107) was 20.53 (14.97). The mean scores in the different dimensions were as follows: 20.54 (18.68) for emotions, 14.91 (15.91) for functioning, and 30.14 (15.45) for symptoms. The impact of seborrheic dermatitis on quality of life was significantly greater in women ($P < .0001$), in whom higher scores were obtained in all dimensions.

The impact of seborrheic dermatitis on quality of life was also studied for the different age groups. Significantly higher scores on the questionnaire (overall score and scores for the emotions and functioning dimensions) were observed in patients aged 16 to 25 and 41 to 60 years ($P < .05$). In contrast, significantly lower scores were observed in patients aged over 60 years ($P < .05$), indicating that the disease had less impact on quality of life in those patients.

Table 3 shows the relationship between severity of symptoms and patients' quality of life. Patients with mild or moderate symptoms had significantly lower overall scores on the questionnaire than those with severe or very

severe symptoms ($P < .0001$), indicating a greater impact on quality of life in patients with more severe symptoms.

Discussion

The main aim of this study was to describe the clinical characteristics of seborrheic dermatitis in patients seen by dermatologists in Spain. As secondary objectives, we sought to describe the treatments used in daily clinical practice and assess the impact of seborrheic dermatitis on quality of life. It is worth noting that to date, despite seborrheic dermatitis being a common skin disease, no epidemiological studies of the disease had been undertaken in Spain and information was unavailable regarding the true impact on quality of life or the usage patterns of different treatments in clinical practice.

In terms of the clinical characteristics of seborrheic dermatitis, we found that the severity of the symptoms assessed (principally erythema, flaking, pruritus, and oily skin) was mild to moderate and that the 2 main sites affected were the face and scalp, consistent with the 2 most widely described forms in the literature.²

It is easy to confuse seborrheic dermatitis with other skin diseases during diagnosis.² In our study, we found that there could be confusion mainly with psoriasis and atopic dermatitis. Nevertheless, in the case of concomitant diseases, when seborrheic dermatitis is associated with atopy, it may be difficult to diagnose, and even more so when it is associated with psoriasis (a condition referred to as seborrheic psoriasis).

Recent review articles on seborrheic dermatitis have continued to stress that the etiology remains unknown,^{2,13} although various factors (both exogenous and endogenous) have been described as possible triggers of the disease, such as outbreaks of seborrheic dermatitis in periods of anxiety and stress. In our study, this factor was reported by most patients as occurring prior to the outbreak of lesions, and it was noteworthy that it was significantly more common in patients of working age. Another exogenous factor that has been described, namely seasonality,¹³ was considered the second most important by affected patients. As would be expected, exposure to air conditioning in the workplace also had a greater effect on patients of a working age. Although exposure to sunlight is thought to be beneficial in seborrheic dermatitis,¹⁴ we found it to be considered a trigger for outbreaks in a substantial proportion of patients in our study.

The most commonly used treatments for seborrheic dermatitis in clinical practice in Spain were topical corticosteroids² and imidazole antimycotics, which are also used in combination. A substantial number of patients with depression received treatment with antidepressants

Table 3. Relationship Between Quality of Life (Overall Score on the Skindex-29 Questionnaire) and Disease Severity

Symptom		Total	0	1	2	3	4	P
Erythema	No.	2073	36	515	1189	312	21	< .0001
	Mean (SD)	20.55 (14.96)	12.28 (10.26)	16.62 (13.15)	20.29 (14.30)	28.46 (17.09)	28.12 (17.06)	
Flaking	No.	2067	42	538	1107	351	29	< .0001
	Mean (SD)	20.58 (14.93)	16.81 (15.06)	17.76 (13.32)	20.45 (14.69)	25.26 (16.65)	26.84 (14.81)	
Infiltration	No.	1930	769	741	343	73	4	< .0001
	Mean (SD)	20.61 (15.01)	16.45 (12.62)	21.62 (14.46)	25.21 (16.95)	32.52 (19.31)	23.28 (17.90)	
Oily skin	No.	2002	285	688	790	217	22	< .0001
	Mean (SD)	20.62 (15.03)	14.59 (11.58)	19.53 (13.80)	22.07 (15.48)	26.22 (17.88)	25.86 (15.05)	
Pruritus	No.	2029	172	634	833	344	46	< .0001
	Mean (SD)	20.54 (14.94)	13.34 (12.98)	16.61 (12.09)	22.14 (15.43)	26.51 (15.92)	28.13 (15.35)	

0 = absence of symptoms, 1 = mild symptoms, 2 = moderate symptoms, 3 = severe symptoms, 4 = very severe symptoms

and anxiolytics. Likewise, depression can be considered a trigger for outbreaks.⁶

Skin diseases can have a severe effect on the quality of life of affected individuals. Diseases such as psoriasis or eczema, for instance, have been observed to have an impact on quality of life comparable to that of cardiovascular diseases.¹⁵ To our knowledge, this is the first study to measure health-related quality of life in patients with seborrheic dermatitis. To this end, we used the Skindex-29 questionnaire, an instrument designed specifically to measure quality of life in patients with skin diseases. Compared with patients with acne or psoriasis, patients with seborrheic dermatitis are less emotionally affected (a score of 20.5 on the emotions dimension in our study compared with scores of 39.2 and 38.9 in patients with acne and psoriasis, respectively¹⁶). On the other hand, the values obtained for functioning and symptoms were similar in patients with seborrheic dermatitis (14.9 and 30.1, respectively) and patients with acne (14.9 and 29.5, respectively) but lower than in patients with psoriasis (22.8 and 42.1, respectively). Thus, symptoms and functioning would not be as severely affected in patients with seborrheic dermatitis than in patients with psoriasis but would be very similar to patients with acne. However, while seborrheic dermatitis does affect quality of life, the effect is clearly limited, as a score of 20.5 was obtained on a scale of 0 to 100 ranging from no impact to maximum impact on quality of life. There is greater impairment of quality of life in patients with more severe symptoms, with a greater effect observed in women. Likewise, the finding

that quality of life is less affected in patients aged over 60 years could be due to greater acceptance of the disease in this group of the population.

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Conflicts of Interest

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References

- Gupta AK, Bluhm R, Cooper EA, Summerbell RC, Batra R. Seborrheic dermatitis. *Dermatol Clin*. 2003;21:401-12.
- Schwartz RA, Janusz CA, Janniger CK. Seborrheic dermatitis: an overview. *Am Fam Physician*. 2006;74:125-30.
- Picardi A, Abeni D. Stressful life events and skin diseases: disentangling evidence from myth. *Psychother Psychosom*. 2001;70:118-36.
- Gupta AK, Nicol KA. Seborrheic dermatitis of the scalp: etiology and treatment. *J Drugs Dermatol*. 2004;3:155-8.
- Mastrolonardo M, Diaferio A, Logroscino G. Seborrheic dermatitis, increased sebum excretion, and Parkinson's disease: a survey of (im)possible links. *Med Hypotheses*. 2003;60: 907-11.
- Maietta G, Fornaro P, Rongioletti F, Rebora A. Patients with mood depression have a high prevalence of seborrheic dermatitis. *Acta Derm Venereol*. 1990;70:432-4.

7. Wiwanitkit V. Prevalence of dermatological disorders in Thai HIV-infected patients correlated with different CD4 lymphocyte count statuses: a note on 120 cases. *Int J Dermatol.* 2004;43:265-8.
8. Kostovic K, Lipozencic J. Skin diseases in alcoholics. *Acta Dermatovenerol Croat.* 2004;12:181-90.
9. Gupta AK, Kogan N. Seborrheic dermatitis: current treatment practices. *Expert Opin Pharmacother.* 2004;5:1755-65.
10. Chren MM, Lasek RJ, Quinn LM, Mostow EN, Zyzanski SJ. Skindex, a quality-of-life measure for patients with skin disease: reliability, validity, and responsiveness. *J Invest Dermatol.* 1996;107:707-13.
11. Chren MM, Lasek RJ, Flocke SA, Zyzanski SJ. Improved discriminative and evaluative capability of a refined version of Skindex, a quality-of-life instrument for patients with skin diseases. *Arch Dermatol.* 1997;133:1433-40.
12. Jones-Caballero M, Penas PF, García-Díez A, Badía X, Chren MM. The Spanish version of Skindex-29. *Int J Dermatol.* 2000;39:907-12.
13. Gupta AK, Bluhm R. Seborrheic dermatitis. *JEADV.* 2004;18:13-26.
14. Berg M. Epidemiological studies of the influence of sunlight on the skin. *Photodermatology.* 1989;6:80-4.
15. Sprangers MA, de Regt EB, Andries F, van Agt HM, Bijl RV, de Boer JB, et al. Which chronic conditions are associated with better or poorer quality of life? *J Clin Epidemiol.* 2000;53:895-907.
16. Lasek RJ, Chren MM. Acne vulgaris and the quality of life of adult dermatology patients. *Arch Dermatol.* 1998;134:454-8.