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ORIGINAL ARTICLE

'The psychosocial burden of alopecia areata and androgenetica': a cross-sectional multicentre study among dermatological out-patients in 13 European countries

G. Titeca,[1,*] L. Goudetsidis,[2] B. Francq,[3] F. Sampogna,[4] U. Gieler,[5] L. Tomas-Aragones,[6] L. Lien,[7] G.B.E. Jemec,[8,9] L. Misery,[10] C. Szabo,[11] D. Linder,[12] A.W.M. Evers,[13] J.A. Halvorsen,[14] F. Balieva,[15] J. Szepietowski,[16] D. Romanov,[17] S.E. Marron,[18] I.K. Altunay,[19] A.Y. Finlay,[20] S.S. Salek,[21] J. Kupfer,[22] F.J. Dalgard,[23,24], F. Poot[25]

[1]Department of Dermatology, Clinique Notre-Dame de Grâce, Gosselies, Belgium
[2]Université Libre de Bruxelles, Gosselies, Belgium
[3]Institute of Statistics, Biostatistics, and Actuarial Sciences, Université Catholique de Louvain, Louvain-la-Neuve, Belgium
[4]Clinical Epidemiology Unit, IDI-IRCCS, Rome, Italy
[5]Department of Dermatology, Justus Liebig University, Giessen, Germany
[6]Department of Psychology, University of Zaragoza, Zaragoza, Spain
[7]Department of Public Health, Hedmark University College, Elverum, Norway
[8]Department of Dermatology, Zealand University Hospital, Roskilde, Denmark
[9]University of Copenhagen,Copenhagen, Denmark
[10]Department of Dermatology, University Hospital of Brest, Brest, France
[11]Department of Dermatology and Allergology, University of Szeged, Szeged, Hungary
[12]Section of Biostatistics, University of Oslo, Oslo, Norway
[13]Institute of Psychology Health, University of Leiden, Leiden, The Netherlands
[14]Department of Dermatology, Institute of Clinical Medicine, Oslo University Hospital, University of Oslo, Oslo, Norway
[15]Department of Dermatology, Stavanger University Hospital, Stavanger, Norway
[16]Department of Dermatology, Wroclaw Medical University, Wroclaw, Poland
[17]Department of Psychiatry and Psychosomatics, Mental Health Research Center, I. M. Sechenov First Moscow State Medical University, Moscow, Russia
[18]Department of Dermatology, University Hospital Miguel Servet. IIS Aragon, Zaragoza, Spain
[19]Department of Dermatology, Sisli Etfal Teaching and Research Hospital, University of Health Sciences, Istanbul, Turkey
[20]Department of Dermatology, Cardiff University School of Medicine, Cardiff, UK
[21]Department of Pharmacy, Pharmacology and Postgraduate Medicine, School of Life & Medical Sciences, University of Hertfordshire, Hatfield, UK
[22]Institute of Medical Psychology, Justus Liebig University, Giessen, Germany
[23]Department of Dermatology, Skåne University Hospital, Malmö, Sweden
[24]National Center for Dual Diagnosis, Innlandet Hospital Trust, Brumundal, Norway
[25]Department of Dermatology, Hôpital Erasme, Brussels, Belgium
*Correspondence: G. Titeca. E-mail: titecag@gmail.com

Abstract

Background Hair diseases play an important burden on patients' lives, causing significant emotional and psychosocial distress. However, the impairment due to different hair conditions, such as alopecia areata (AA) and androgenetic alopecia (AGA), has rarely been compared.

Objective The aim of this study was to assess the psychological burden of subgroups of patients with different hair diseases and to compare them to a healthy population.

Methods In this study, we analysed a subgroup of patients with hair diseases from patients of a large multicentre study including 3635 dermatological patients and 1359 controls from 13 European countries. In the subgroup of patients with hair diseases, we analysed the socio-demographic characteristics, the stress level, and the impact of hair diseases on quality of life (QoL), anxiety, and depression and we compared them among patients with AA, AGA and healthy controls.

Results The study population included 115 patients (77% women, 23% men) with hair diseases, 37 of whom with AA and 20 with AGA. Patients with hair diseases had a lower education level than healthy controls (medium educational level: 43% vs. 28%). Overall, 41% of the patients reported stressful life events during the last 6 months compared with 31% of the controls. Patients with the same age, sex, depression level and comorbidities had a worse QoL when suffering from AA than from AGA (Mean Dermatology Life Quality Index score: 5.8 vs. 2.5).

Conclusion Patients with hair diseases are more anxious, depressed and have a lower QoL than controls.
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Conflict of interest
None.

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None.

Introduction
Hair is an important part of physical appearance, and thus, hair diseases may lead to an important burden on patients' lives, causing significant emotional and psychosocial distress.[1] The most common hair diseases are alopecia areata (AA) and alopecia androgenetica (AGA).

It has been observed that AA significantly reduces patients' quality of life (QoL).[2] In addition, AA patients have a high prevalence of psychiatric comorbidities, such as anxiety, depression, social phobia and personality disorders.[3,4] It is therefore difficult to know to what extent the impact of this impairment is, comparable to the one caused by other skin diseases.

In an Indian study of alopecia with a wide range of etiologies including chemotherapy-related alopecia, Sellami *et al.*[5] have shown that alopecia patients were more anxious and depressed than controls. In 50 AA patients, 62% had symptoms of anxiety and 38% of depression.[5] These percentages were significantly higher than in the control group. In patients with AGA, a significant impact on QoL was found, particularly when associated with high severity, a longer duration, younger age, having received previous non-medical hair care and hospital visits for AGA treatment.[6]

Compared to skin conditions accompanied by itching, pain or other sensations that provide distinctive symptoms but not specifically affecting hair and scalp, most hair diseases cause patients generally only to experience the symptom of 'hair loss'. Because of this mono-symptomatic aspect of hair diseases, it is interesting to investigate other associated aspects that may differentiate the impact of different hair diseases (AA, AGA and other diseases).

The aim of this study was to assess the psychological burden of patients with hair diseases in a large European sample. For this purpose, we compared different subgroups of patients with hair diseases with a healthy control population, regarding the level of anxiety, depression, stress and QoL impairment.

Methods

Study population
A multicentre, observational and case–control study was conducted in 13 European countries. The details have been described previously.[7] In brief, at each dermatological out-patient clinic, consecutive patients were invited to participate in the study on one or more random days until 250 were reached. The inclusion criteria were as follows: age 18 years, being able to read and write the local language, and not suffering from severe psychosis, to reflect the majority of patients and avoid any overestimation of any possible co-occurrence between mental and skin disease.

Controls were recruited in all centres among the hospital staff who did not currently have or previously had any dermatological disorder. Both cases and controls had to complete questionnaires on QoL and psychological comorbidities. Data were complete for 3635 patients and 1359 controls. In the present study, we have included patients with hair diseases and healthy controls.

Questionnaires
The first part of the questionnaire recorded socio-demographic variables including age, gender, marital status and self-reported socio-economic status. Ethnicity was self-reported by each participant referring to their own country of birth. Disease severity was assessed by the clinician on a 3-point scale: 'mild', 'moderate' and 'severe'.

The presence of symptoms of depression and anxiety was assessed with the Hospital Anxiety and Depression Scale (HADS). The HADS is a well-validated instrument, showing good psychometric properties, aimed to assess symptoms of anxiety disorders and depression in somatic, psychiatric and primary care patients, as well as in the general population. The questionnaire includes 14 items: seven items assessing anxiety and seven assessing depression, each with four possible answers (score: 0, 1, 2 and 3). The total score is obtained by summing the ratings of the 14 items. The sum of the ratings of the seven items of each subscale gives separate scores for the Anxiety (HADS-A) and the Depression (HADS-D) subscales (score range: 0–21 for both subscales). For each dimension of anxiety and depression, a score from 0 to 7 is considered normal, from 8 to 10 a borderline case and from 11 to 21 a case in need of further examination or treatment. This instrument was used in the validated translations relevant to the study countries.

To assess health-related QoL (HRQoL), we used two different self-rated questionnaires: the Dermatology Life Quality Index (DLQI) and the EuroQol-5 Dimensions three Levels version (EQ-5D-3L). The DLQI is a dermatology specific, ten-item questionnaire used to measure the impact of skin disease on the QoL

of an affected person. The ten questions cover the following topics: symptoms, embarrassment, shopping and home care, clothes, social and leisure, sport, work or study, close relationships, sex and treatment. Each question is scored from 0 to 3, giving a possible total score range from 0 (no impact of skin disease on QoL) to 30 (maximum impact on QoL).

The EQ-5D-3L essentially consists of 2 parts: the EQ-5D descriptive system and the EQ visual analogue scale (EQ VAS). The EQ-5D-3L descriptive system comprises the following five dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Each dimension has three levels: no problems, some problems and extreme problems. The respondent is asked to indicate his/her health state by ticking (or placing a cross) in the box against the most appropriate statement in each of the five dimensions. EQ-5D health states may be converted into a single summary number (index value), which reflects how good or bad a health state is according to the preferences of the general population of a country/region. The 'EQ-5D-5L Crosswalk Index Value Calculator' can be downloaded from the EuroQol website. The range of the Index value extends from −0.624 to 1. The EQ VAS records the respondent's self-rated health on a vertical, visual analogue 100-degree scale (0 = 'worst imaginable health state'; 100 = 'best imaginable health state').

This information can be used as a quantitative measure of health outcome as judged by the individual respondents.

Stress was assessed with the item 'Have you had any stressful life event during the last 6 months?' (yes/no).

Patients completed all the questionnaires, while controls did not complete the DLQI.

Statistical analysis

Analyses were performed with R version 3.1.0.[8] Baseline characteristics were compared between groups (controls vs. any hair diseases; controls vs. AA and AGA; men vs. women; different age groups) by Fisher's exact tests for categorical variables and t-tests or ANOVA for continuous variables (or Wilcoxon tests if needed). The categorical scores were compared by Fisher's exact tests between groups. The DLQI scores and EQ-5D scores, considered on continuous scales, were also compared (separately) by multivariate regressions after a logarithmic transformation for DLQI (to fulfil the normality assumption) with the groups, age, sex, depression and comorbidities as predictors (adjusting variables). The HADS scores, considered on a continuous scale, were compared between groups with *t*-tests or ANOVA (the normality assumption has been checked with QQ plot). The EQ-5D scores were compared by Wilcoxon tests, or Kruskal–Wallis non-parametric ANOVA between gender and categorized age, while their five components were compared by Fisher's exact tests. The population was adjusted by linear model for age, sex, depression and comorbidities. Some results are presented using box plots which are a convenient way of graphically depicting groups of numerical data through their quartiles. Box plots may have lines extending vertically from the boxes (*whiskers*) indicating variability outside the upper and lower quartiles, hence the terms box-and-whisker plot and box-and-whisker diagram.

Results

Details of participants' characteristics have been previously published[7] and are included as supplementary material (Table S1).

In this study, we included 115 patients with hair diseases and 1359 controls. In the group of patients with hair diseases, there were 37 patients with AA, 20 patients with AGA and 58 patients with other hair conditions such as lichen planus of the scalp, telogen effluvium, cicatricial alopecia, frontal fibrosing alopecia and others. The diagnosis was based on clinical findings (No biopsy or other tests were asked). There were more hair disease cases in Belgium (23%), Spain (17%) and Italy (11%). The countries with less cases were UK (1%), and Denmark, France and Norway (3% in the 3 countries).

Table 1 Comparison between hair diseases group and controls

Variable	Level	*N* (%) Hair diseases	*N* (%) controls	*P*-value
Sex	Male	27 (23%)	453 (33%)	0.03
	Female	88 (77%)	903 (67%)	
Educational level	Medium	49 (46%)	375 (28%)	0.001
	High	26 (25%)	399 (30%)	
	University	31 (29%)	577 (43%)	
Stressful life events reported during the last 6 months		47 (41%)	412 (31%)	0.02
		Mean values (SD)	**Mean values (SD)**	***P*-value**
Age		41.6 (SD)	41.1 (SD)	0.732
HADS anxiety		7.9 (SD)	5.6 (SD)	<0.001
HADS depression		5.4 (SD)	3.6 (SD)	<0.001
		Index value hair diseases	**Index value controls**	***P*-value**
EQ-5D		0.8	1	<0.001

Table 1 shows a comparison between the characteristics of the hair diseases group and the controls. In the hair diseases group, there were more females than in the control group; 46% of the patients were educated to a medium education level (i.e. primary or secondary school) compared with 28% of the controls. Finally, tertiary (university) level education was achieved by a smaller proportion of patients than controls (29% vs. 43%).

Comparing subgroups of patients with hair diseases, we observed that AA and the subgroup of other hair diseases were more likely to have achieved a medium level education than AGA patients (47% and 49%, respectively, vs. 35%; $P = 0.001$). A higher proportion of AA patients were married (70%) compared to the other hair disease population (49%; $P = 0.021$). Stress was reported by 49% of the AA patients and 35% of the AGA and 31% of controls ($P = 0.061$).

Hospital Anxiety and Depression Scale mean score in patients (anxiety 7.9; depression 5.4) was significantly higher compared to controls (anxiety 5.6; depression 3.6; $P < 0.001$). Overall, 41% of the patients reported stressful life events during the last 6 months compared with 31% of the controls.

Patients with same age, sex and comorbidities had a higher DLQI score when suffering from AA than AGA, (Fig. 1). Figure 2 shows that patients with AA had a higher HADS score compared to the AGA population. An ANOVA test was performed to compare controls, AA and AGA population and confirmed the results above (Anxiety $P < 0.001$; depression $P = 0.005$).

Females had a poorer QoL (Fig. 3a), especially in the pain dimension ($P = 0.001$) and anxiety and depression dimension ($P = 0.012$). Patients aged more than 50 years old had lower EQ-5D scores ($P < 0.001$) and EQ VAS scores (Fig. 3b), i.e. a more impaired QoL, than younger patients.

Comparison between controls, AA and AGA patients showed a lower EQ-5D score in both AA and AGA patients when adjusted for age, sex, depression and comorbidities (Fig. 3c). Specifically, EQ-5D activity, pain and anxiety and depression dimensions showed lower scores in all hair patients compared to controls ($P = 0.002$, $P < 0.001$, $P < 0.001$). Also, EQ VAS score was lower for all hair patients compared to controls when adjusted for age, sex, depression and comorbidities. AA patients reported lower self-evaluated health than AGA patients and controls when using the EQ VAS scale (Fig. 3d) but a lower EQ-5D

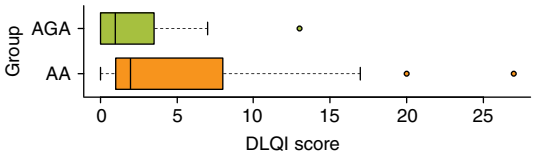


Figure 1 Median scores of quality of life as assessed with the Dermatology Life Quality Index in alopecia areata (AA) and androgenetic alopecia (AGA; $P = 0.022$).

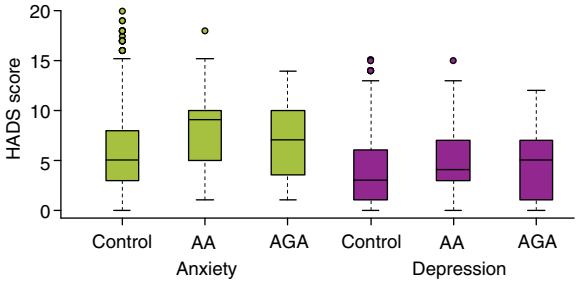
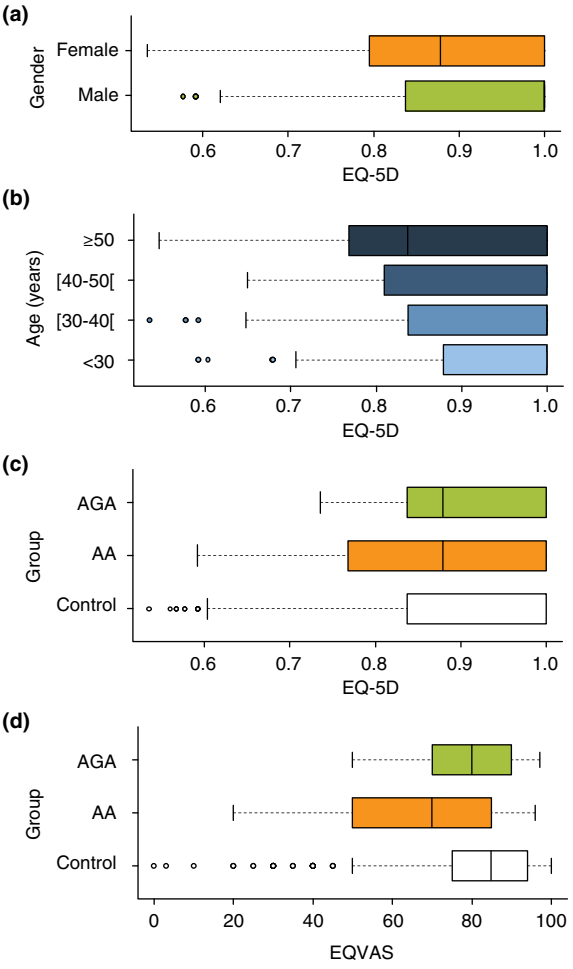


Figure 2 Score of anxiety and depression (HADS) in control – AA–AGA patients (Anxiety $P < 0.001$; depression $P = 0.02$).



Figures 3 (a) Median scores for health-related quality of life (HRQoL) as assessed by the (EQ-5D) in male vs. female patients ($P = 0.001$). (b) HRQoL as assessed by the EQ-5D in different age groups ($P < 0.001$). (c) HRQoL in general health (EQ-5D) in control – AA-AGA patients ($P = 0.003$).(d) HRQoL with visual analogue score (EQ VAS) in control – AA-AGA patients ($P < 0.001$).

anxiety and depression scores ($P < 0.001$). All other comparisons did not show any significant differences.

Concerning disease severity, the mean HADS scores were not significantly different, while the mean DLQI was significantly higher for the highest grade of severity compared to the others.

Discussion

How do hair diseases affect patients' lives? In this study, we found that patients affected by hair disease present more anxiety, a more depressed mood and an impaired QoL if compared with the control group without skin disease. These differences are more pronounced in AA patients.

The special impact of AA is in line with previous studies. Liu *et al.* showed that HRQoL experienced by patients with AA is similar to that seen in patients with other chronic skin diseases including atopic dermatitis and psoriasis.[9,10] Rencz *et al.*[2] have also demonstrated that patients with AA experience significant impairment in HRQoL, especially in the area of mental health. Although AGA is more common than AA, in this study AA patients were 37, while AGA patients were 20. This could be due to AGA being considered by many patients as a familial or genetic trait, and thus not needing a medical advice. Moreover, AGA has a lower esthetical impact compared to AA. AA patients may suffer more than patients affected by other hair diseases for different reasons. AA is a chronic disease and is well known for having a significant impact on the psychological sphere of patients. Concealing the symptoms of AA is relatively difficult, especially for women. T. Cartwright showed[11] that QoL was significantly poorer for women with alopecia, compared with men. There were gender differences in several of the DLQI subscales. Women were significantly more likely to feel that alopecia affected their leisure activities and personal relationships, while men scored higher on work interference than women.

Alopecia areata also has a major impact on the social life of a patient, leading him/her to feel socially alienated and rejected. Furthermore, AA is associated with mental disorders such as depression, anxiety disorders, body dysmorphic disorders, social phobia and suicidal thoughts. These mental disorders could be primary conditions which declare themselves in medical problems associated with the skin or these could be a result of this serious and disfiguring condition.[12] It is interesting to note that depression and anxiety were not correlated to the disease severity. It means that patients with mild AA may have as important psychological distress as patients with severe disease. This observation is in line with the relationship between disease severity and psychological distress observed in psoriasis.[13]

An interesting result was the significant difference of marital status between the AA patients and other hair disease patients. In fact, 70% of AA patients were in a relationship compared to 49% of the others. In a previous study, we demonstrated that there are more dysfunctional families in AA patients.[14] Those dysfunctions could be fusions and ruptures, generational repetition of behaviours of dependence or vulnerability and unsolved mourning if traumatic events are experienced. We could hypothesize that not resolving these problems could lead to increasing the perceived stress and consequently to more anxiety and depression. Moreover, these patients have a lower education level, which is usually correlated with earlier partnerships.[15,16] Further studies should be done to confirm this hypothesis.

Concerning the AGA patients, we also found an impact on HRQoL. Their level of anxiety and depression was also higher than for the controls. In previous studies, it has been shown that the HRQoL of male and female AGA patients is altered, in particular in younger patients.[6,15,17] This should not be underestimated, and psychological support could be helpful for these patients.

A limitation of this study is the small number of patients, despite the large population from which they were extracted. This may be partly due to the fact that the research centres were general hospitals and not hair diseases specialized centres. Also, several generic and dermatology-specific HRQoL instruments have been used, but no specific instruments for AA. The newly developed AA-specific measures seem very promising; however, a more extensive assessment of validity and reliability is needed.[18,19] Another limitation of the study was the difference in educational level between controls and patients with hair disease, probably due to the fact that controls were part of the hospital staff.

In conclusion, patients with hair diseases experience a considerable impact on their QoL and may benefit from a psychological assessment. We recommend the use of anxiety and depression questionnaires such as HADS, which is specific and user-friendly. Some caution remains warranted: we must take into account the risk of biases such as underestimation with self-administered questionnaires; moreover, AA patients are often alexithymic[20] and therefore have problems in articulating their affections. We therefore recommend letting the patients complete the questionnaire on their own and evaluate the answers with the dermatologist. Also, the observation of patients' non-verbal behaviour is an invaluable tool to assess the presence of depression. Finally, once an adequate psychological assessment has been performed, psychotherapeutic and psychopharmacological support should be offered to patients whenever such support appears to be conducive to a better outcome.

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Supporting information

Additional Supporting Information may be found in the online version of this article:

Table S1. Patients characteristics.