

ORIGINAL ARTICLE

Quality of health care of atopic eczema in Germany: results of the national health care study AtopicHealth

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Abstract

Background The successful treatment of atopic eczema (AE) should result in the improvement of both physical symptoms and patient's quality of life (QoL). This study was conducted using a sample of dermatologists throughout Germany. This is due to dermatologists being the main health care providers of AE.

Objectives Obtaining reliable data on quality of care of AE from both the patient's and the physician's perspective.

Methods This cross-sectional study assessed: the individual clinical history; dermatology-specific QoL (DLQI); state of health (EQ-5d-VAS); treatments; burden caused by disease and treatment; patient-defined treatment benefit (PBI).

Results Data from 1678 adult patients (60.5% female, mean age: 38.4 ± 15.9) were analysed. The most frequently used treatments during the last five years were emollients (90.4%) and topical corticosteroids (85.5%). In this study, 75.8% of the patients felt only moderately or not at all impaired by their treatment. The mean DLQI (0 = minimum–30 = maximum QoL impairment) was 8.5 ± 6.5 . The EQ-5d-VAS (100 = best possible) was 63.6 ± 22.0 on average. 26.6% reported suffering 'often' or 'every night' from sleeplessness due to severe itching. Mean PBI was 2.4 ± 1.1 (4 = maximum benefit).

Conclusions This study provides first data on the health care of adults with AE in Germany at a national level and reveals the need for a more effective care. Whereas most patients consider their treatment-related burden as low, the daily burden of the disease seems to be high: one third reports sleeplessness due to itching which indicates insufficient therapeutic regimes in these cases. A better implementation of the German national guideline for AE and a systematic analysis of the difficulties causing its limited effects is needed.

Received: 23 November 2012; Accepted: 14 March 2013

Conflict of interest

J Ring has received grants from Astellas Pharma GmbH, Munich, Germany and Novartis AG, Basel, Switzerland in the past three years. Anna Langenbruch has received travel expenses from Astellas Pharma GmbH, Munich, Germany. The other authors declare that they have no conflicts of interest.

Funding sources

The study received financial support from Astellas Pharma GmbH, Munich, Germany.

Introduction

Atopic eczema (AE) is a chronic, relapsing and inflammatory skin disease that affects infants, children and adults throughout the world. AE has a high socio-economic impact¹ and a broad effect on the quality of life of the affected patients.² With an estimated current incidence of 10–20% in children and 1–3% in adults, the disease is characterized by an increasing prevalence in industrialized countries over the past decades.³ AE is related to other atopic symptoms like allergic rhinitis, allergic conjunctivitis and asthma.^{4,5} Intensely, pruritic skin lesions

evolve as the result of complex interactions between IgE bearing antigen-presenting cells, T-cell activation, mast cell degranulation, keratinocytes, eosinophils, and a combination of immediate and cellular immune response.^{6,7} Clinical experience has shown that AE is associated with a considerable detriment to quality of life (QoL), affecting all areas of daily life as well as physical and emotional well-being.⁸ The proportion of patients showing clinically significant levels of impairment is even higher in AE than in psoriasis.^{9–11} QoL impairment also affects the patient's family and interferes with the perception of

treatment.¹² Treatment of AE remains a challenge and there seems to be a certain heterogeneity concerning treatment concepts between different disciplines.¹³ Recommendations on standards of care have been given by multi-professional groups dedicated to atopic eczema outcomes research,^{14,15} dermatological societies and research groups.^{16,17} Correspondingly, a German national guideline on AE treatment was first published in 2009.¹⁸

On the background of increasing rationing of funds in the health care system, like the exclusion of emollients from reimbursement, it is becoming ever more important to optimize the care of patients with AE. As a result of the socioeconomic impact of AE, health services research efforts in German dermatology were intensified to provide guideline-based care and support and analyse the effectiveness of daily care. Yet to implement quality improvement measures in the nationwide management of AE knowledge of available care on recent health care is needed.

The goal of the present health services research study was the nationwide assessment of the current health care situation and quality of life of patients with AE in dermatological clinics and practices.

Patients and methods

Study design

In this non-interventional cross-sectional prospective study, data relevant to the health care of patients with atopic eczema was gained using standardized questionnaires (each with a physician and a patient section).

Selection of centres and patients was performed in a two-step cluster sample method.

This study was closely modelled on the national health care study on psoriasis from 2007 and whenever possible identical outcome parameters were assessed.¹⁹

Recruitment

To reduce the selection bias of patients and centres and to ensure high methodological quality, participating centres were recruited by lottery as well as by choice. In the lottery $n = 458$ dermatologists were drawn on the basis of chance among the total pool of office-based dermatologists in Germany with membership in the Professional Association of German Dermatologists (Berufsverband der Deutschen Dermatologen, BVDD) ($n = 3217$). $N = 130$ centres were selected due to their active participation in the 2007 national health care study about psoriasis.¹⁹ $N = 16$ centres were recruited due to their activity as advisory board members within this study. In total 604 centres were contacted. In this study, 176 (later 174) agreed to participate (29.1%) and were sent the study documents and questionnaires. Ninety-one (51.7%) of the participating centres actively recruited patients.

Patients

All patients were over the age of 18, with atopic eczema, and had given written consent to participate in the survey. Before the start of the study, approval was gained from the ethics commission of the State Medical Association of Hamburg.

Outcome parameters

Physician questionnaire This assessed the clinical characteristics of atopic eczema, concomitant diseases, pruritus and the severity of atopic eczema [SCORAD and investigator global assessment (IGA)] of the respective patient.

Patient questionnaire This examined about socio-demographic characteristics, allergies, pruritus, current and previous medication, satisfaction with care and treatment benefits (Patient Benefit Index),^{20,21} general state of health (EQ5-d VAS), health of the skin (FLQA-d VAS),¹¹ burden (caused by disease and treatment) and skin disease related quality of life (DLQI).²² Quality of life was assessed in conformity with the DDG/AWMF guideline.²³

Quality of care on the basis of quality indicators

The criteria to characterize the quality of care for atopic eczema were already established for psoriasis patients. As part of the 2005 health services study about psoriasis²⁴ criteria were developed by an expert consensus of 15 dermatologists as well as epidemiologists, economists and biometricians. To compare the health care of atopic eczema to psoriasis this article characterizes the quality of care in accordance with the existing criteria:

- 1 Mean severity of atopic eczema (SCORAD and IGA).
- 2 Mean quality of life of patients (DLQI).
- 3 Proportion of patients with severe atopic eczema (IGA = severe/very severe).
- 4 Proportion of patients with severe impact on quality of life (DLQI > 10).
- 5 Proportion of patients with previous systemic therapy.
- 6 Proportion of patients with severe atopic eczema and previous systemic therapy.
- 7 Proportion of patients with inpatient therapy in the past five years.
- 8 Mean number of days absent from work.

Statistical analysis

All the data were copied from the original questionnaires and manually entered in Excel databases by trained and experienced data managers. To detect errors of data entry,²⁵ the data were entered twice in two different databases by independent managers. Afterwards, the two records of the same patients were compared and in case of discrepancy an independent data manager determined the correct entry using the original questionnaires.

All data were described with standard statistical parameters (frequencies for categorical data; mean value, standard deviation for continuous data).

Statistical correlation of continuous data was measured by the Pearson product-moment correlation coefficient. Differences between groups with regard to frequencies were analysed by chi-squared tests. Means of two groups were compared by unpaired *t*-tests.

It is important to notice that the big sample size corresponds to high statistical power and affects the significance test results.

Hence, each unpaired *t*-test was supplemented by effect-size determination (Cohen's *d*). Cohen's *d* is defined as the difference between two means divided by the pooled standard deviation.²⁶ According to Cohen, sizes of 0.2, 0.5 and 0.8, respectively, represent weak, medium and strong effects in unpaired *t*-tests.²⁷ Each chi-squared test was also supplemented by effect-size determination (Cohen's *w*²). Effect sizes of 0.01, 0.09 and 0.25 are considered small, medium, and large, respectively, in *w*².²⁷

Hierarchical multiple regression models were calculated to predict quality of care indicators by severity grade and kind of skin disease. Socio-demographic variables were entered in the first block in order to control their influence. In the case of a metrical dependent variable, a linear multiple regression was calculated and in the case of a binary dependant variable a binary logistic regression was performed.

All statistical tests were two-tailed and the alpha level was set at 5%.

Data management and descriptive data analysis were done using SPSS Statistics for Windows (Version 20.0, IBM, Armonk, NY, USA).

Results

Centres

In this study, questionnaires (3720 from physicians and 3644 from patients) were returned to the study centre between January and December 2010. Of these, 3979 questionnaires were not filled in and thus were excluded (54%). Also excluded were 38 data sets (patient questionnaires with the corresponding physician questionnaires) due to lack of inclusion criteria and 6 due to conflicting statements in the patient and physician questionnaire. A further 108 questionnaires could no longer be considered due to late delivery. Therefore, 1678 data sets were entered for analysis (Fig. 1).

Socio-demographic and clinical characteristics

Within the 1678 participating patients (60.5% female), the mean age was 38.4 ± 15.9 years. The mean duration of disease was 22.1 ± 15.1 years. 49.4% of patients had a positive family history for atopic diseases (Table 1). On average, 10.4% of the patients' body surface area was covered with dermatitis lesions. The palms of the hand and the flexor side of the arms were the most affected areas of the body. Regarding the concomitant diseases, rhinoconjunctivitis was with 54.7% the comorbidity of highest prevalence, followed by bronchial asthma with 30.1%

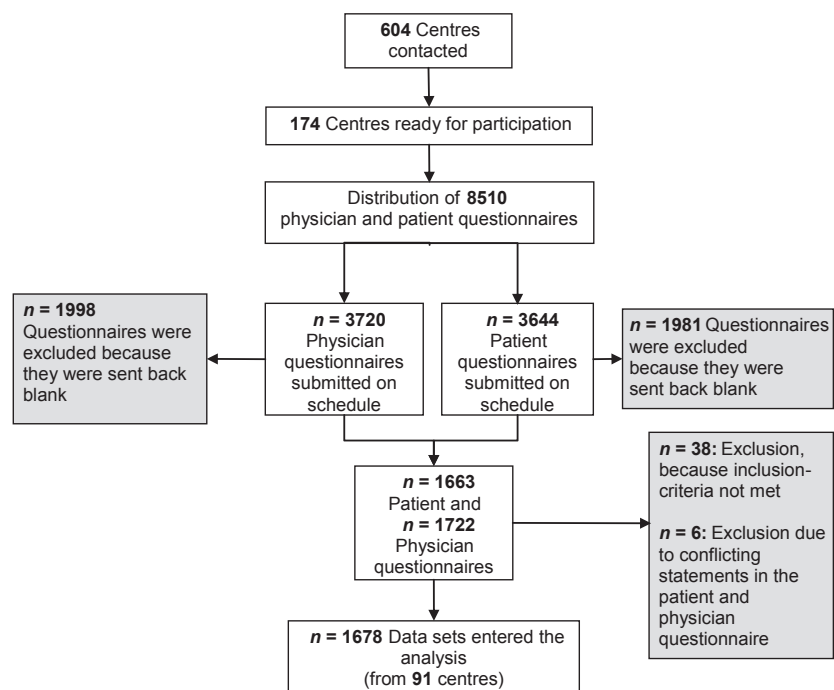


Figure 1 Flowchart of inclusions and exclusions (final inclusion: *n* = 1678).

Table 1 Characteristics of the study participants

Gender*	n		%	
Female	1016		60.5	
Male	662		39.5	
Age*	n	Range	MW	SD
All patients	1668	18–98	38.4	15.9
Case history*	n	Range	MW	SD
Time since diagnosis of atopic eczema	1496	0–84	22.1	15.1
Family history*	n		%	
Positive history for atopic diseases	826		49.4	

*Missing values: Gender: $n = 0$; Age: $n = 10$; Time since diagnosis of AE: $n = 241$; Family history of atopic diseases: $n = 5$.

prevalence. In addition, 75.5% of the patients had at least one allergy (including those 2.5% who had a contact allergy according to their dermatologist but did not state to have an allergy themselves). The allergy with the highest prevalence among patients was allergy to pollen at 57.2%. In this study, 49.1% were allergic to pets, 48.1% to house dust and 25.4% to mould. (Fig. 2)

Clinical severity

The mean SCORAD was 42.3 ± 18.6 whereby men had a higher SCORAD than women (46.0 ± 19.2 vs. 39.8 ± 17.8 $P < 0.001$, $d = 0.33$). The mean globally assessed severity (IGA) was 2.1 ± 1.0 (on a scale from 0 = not affected to 4 = very severely affected), with 1.8% of the patients being not affected, 26.8% mildly affected, 37.3% moderately affected,

26.3% severely affected and 7.8% very severely affected. The correlation between SCORAD and IGA was 0.75. The mean health state of the skin (FLQA-d, visual analogue scale) was 4.9 ± 2.5 (10 = best possible state of health). The self-rated general state of health (EQ-5d-VAS, 100 = best possible state of health) was 63.6 ± 22.0 (Table 2). On average, the patients did not go to work due to atopic eczema on 7.0 ± 21.9 days (patients in paid work only: 6.4 ± 20.6) in the last year and 21.0% have spent at least one night in hospital because of their disease.

Quality of life and subjective burden of disease

The mean disease specific quality of life (DLQI) was 8.5 ± 6.5 . 32.1% had a DLQI of more than 10. There were no gender differences. The correlation between the patient's subjective burden measured by DLQI and the physician's severity statement measured by SCORAD and IGA was $r = 0.42$ ($P < 0.001$) vs. $r = 0.44$ ($P < 0.001$).

In this study, 26.6% of patients reported to suffer 'often' or 'every night' from sleeplessness due to severe itching and 35.8% stated that they often or always scratched their skin until it bled (Table 3). The most often stated reasons for itching or for worsening of dermatitis symptoms could be summarized as 'emotional factors and/or stress' (quoted by 73.1% of the patients). The strength of pruritus was specified by the patients as 2.9 ± 1.1 (on a scale from 0 = I never have pruritus to 4 = I always have pruritus) and as 5.1 ± 2.7 by the physician (on a scale from 0 = no pruritus to 10 = very strong pruritus). The correlation was $r = 0.42$ ($P < 0.001$) between the physician's and the patient's statement about pruritus.

Characteristics of care

The most frequently used treatments during the last five years were emollients (90.4%) followed by topical corticosteroids (85.5%). In addition, 42.5% used at least once a topical calcineurin inhibitor. Within the last five years, 37.2% of the patients used at least one systemic therapy due to atopic eczema (Fig. 3). Among those patients with severe atopic eczema (IGA = severe or very severe) 50.8% received systemic therapy within the last five years (vs. 30.2% of the less severely affected patients, $P < 0.001$, $w^2 = 0.04$).

On average, the patients rated the health care of their atopic eczema during the last years as 2.6 ± 0.9 (1 = very good, 5 = poor).

In this study, 1099 of the participants made a statement about their current therapy. The most mentioned active treatments being used were topical steroids ($n = 497$, 45.2%), topical calcineurin inhibitors ($n = 187$, 17.0%), UV therapy ($n = 120$, 10.9%) and systemic immunosuppressive treatment ($n = 113$, 10.4%). Patients with severe atopic eczema mentioned less often the application of topical steroids (39.4% vs. 48.2%; $P < 0.01$, $w^2 = 0.01$), more often the application of systemic

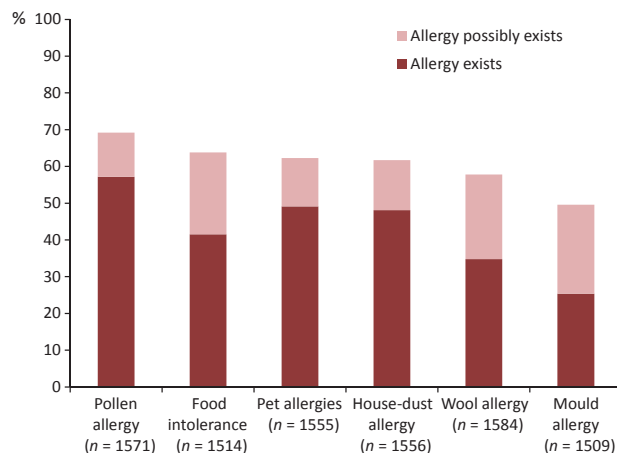


Figure 2 Allergies and intolerances of patients with atopic eczema.

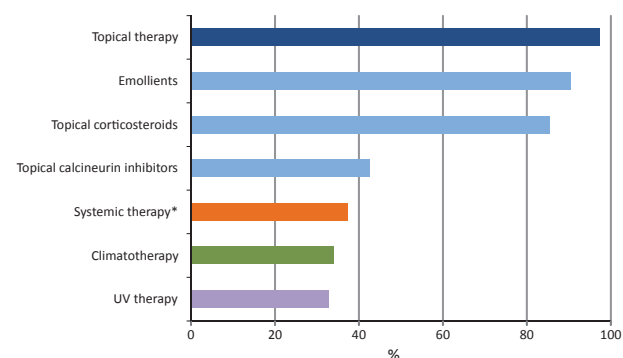
Table 2 Severity parameters of the patients with atopic eczema assessed by physicians (#1–3) and patients (#4–7)

#	Parameter	n	MV*	Range	M	SD	Median
1	IGA (investigator global assessment)	1663	15	0–4	2.1	1.0	2
2	SCORAD	1613	65	0–101.4	42.3	18.6	40.6
3	'Objective' SCORAD	1619	59	0–83.4	34.4	15.4	32.4
4	EQ-5D	1577	101	0–100	63.6	22.0	70.0
5	FLQA-d VAS	1581	97	0–10	4.9	2.5	5.0
6	Number of hospital overnight stays due to AE (last five years)	1363	315	0–300	1.0	8.8	0.0
7	Days not able to work due to AE (last 12 months)	984	694	0–365	7.0	21.9	0.0

*Missing values (n)

Table 3 Burden caused by itching

Symptom frequency	n	%
Sleeplessness (n = 1605; n = 73 missing values)		
Never	337	21.0
Rarely	367	22.9
Sometimes	474	29.5
Often	323	20.1
Always	104	6.5
Scratching skin until it bleeds (n = 1608; n = 70 missing values)		
Never	379	23.6
Rarely	329	20.5
Sometimes	324	20.1
Often	420	26.1
Always	156	9.7



* Antihistamines were not included

Figure 3 Treatment of atopic eczema in the last five years (n = 1588; n = 90 missing values).

immunosuppressive treatment (16.1% vs. 7.4%, $P < 0.001$, $w^2 = 0.02$) and UV therapy (14.2% vs. 9.2%, $P < 0.05$, $w^2 = 0.01$).

Patient-defined therapeutic benefit (PBI) was 2.4 ± 1.1 on average (4 = maximum benefit) and differed between severely and less severely affected patients (2.2 ± 1.1 vs. 2.5 ± 1.0 , $P < .001$, $d = 0.29$).

Health care quality indicators in comparison with 'PsoHealth 2007'

On average, the patients of the present survey were younger than the participants of 'PsoHealth 2007'. In this study, 31.5% of the patients with psoriasis could be defined as severely affected (IGA > 2), while 34.2% of the AE patients could be put in this category. Patients with AE had higher QoL impairments ($P < 0.001$), less often previous systemic therapy ($P < 0.001$) and more days unable to work ($P < 0.01$) than the patients with psoriasis (Table 4).

To detect if the kind of skin disease (psoriasis or atopic eczema) and the severity grade are meaningful predictors for the different quality of care indicators hierarchical multiple regression analyses were performed. To control the influence of age, sex and family history of the respective skin disease these variables were entered in the first block.

In the regression model predicting QoL the demographic variables explained 2.1% of the variance. Severity and kind of skin disease added 17.2% of variance explanation. Severity of disease ($\beta = 0.42$, $P < 0.001$) was a significant predictor while the kind of skin disease was not significant. (Table 5)

In the regression model predicting number of days not able to work due to the skin disease the demographic variables explained 0.3% of the variance. Severity and kind of skin disease added 1.1% of variance explanation. Severity ($\beta = 0.09$, $P < 0.001$) and kind of skin disease ($\beta = 0.05$, $P < 0.05$) were significant predictors.

Predicting inpatient treatment (for at least one night) in the past five years demographic variables explained 0.7% of the variance. Severity and kind of skin disease added 6.2% of variance explanation. Severity (OR = 1.755, 95% CI = 1.584–1.944, $P < 0.001$) was a significant predictor with a higher probability of patients with higher severity grade to have had at least one hospital overnight stay in the past five years (Table 6).

Predicting the application of systemic therapy in the past five years demographic variables explained 0.3% of the variance (Nagelkerke's R-Square = 0.003). Severity and kind of skin disease added 4.1% of variance explanation. Severity (OR = 1.414, 95% CI = 1.306–1.532, $P < 0.001$) and kind of skin disease (OR = 0.594, 95% CI = 0.509–0.694, $P < 0.001$) were significant

Table 4 Comparison of health care quality indicators between 'PsoHealth' (patients with psoriasis, $n = 2009$) and 'AtopicHealth' (patients with atopic dermatitis, $n = 1678$)

Indicator	PsoHealth			AtopicHealth			<i>t</i>	<i>df</i>	<i>P</i>	<i>d</i>
	MV*	<i>n</i>	<i>M</i> ± <i>SD</i>	MV*	<i>n</i>	<i>M</i> ± <i>SD</i>				
Mean quality of life of the patients (DLQI)	51	1958	7.5 ± 6.4	87	1591	8.5 ± 6.5	−4.7	3547	0.000	0.16
Mean number of days not able to work (patients in paid work, last 12 months) †	71	1082	4.0 ± 18.4	160	880	6.4 ± 20.6	−2.7	1783.6	0.008	0.12
	MV*	<i>n</i>	%	MV*	<i>n</i>	%	χ^2	<i>df</i>	<i>P</i>	<i>w</i> ²
Patients with severe impairments to their quality of life (DLQI > 10) (%)	51	553	28.2	87	511	32.1	6.3	1	0.012	0.00
High severity (IGA > 2) (%)	42	619	31.5	15	568	34.2	2.954	1	0.088	0.00
Patients with previous systemic therapy (%)	43	929	47.3	90	590	37.2	36.6	1	0.000	0.01
High severity (IGA > 2) and previous systemic therapy ‡ (%)	33	334	55.7	19	272	50.8	2.646	1	0.108	0.00
Inpatient treatment in the past 5 years (%)	110	382	20.1	315	286	21.0	0.37	1	0.575	0.00

*MV = missing values (*n*).

†Irregular total *n* (patients in paid work): *n* = 1153 (PsoHealth), *n* = 1040 (AtopicHealth).

‡Irregular total *n* (patients with high severity): *n* = 619 (PsoHealth), *n* = 568 (AtopicHealth).

Table 5 Hierarchical multiple regression analyses predicting quality of life ($n = 3415$) and days unable to work ($n = 1890$)

Model	Variable*	<i>R</i>	<i>R</i> ²	β	<i>P</i>
Dependant variable: Quality of life					
1		0.144	0.021		
	Age			−0.137	0.000
	Sex			0.033	0.049
	Family history of the disease			−0.012	0.467
2		0.439	0.193		
	Severity (IGA)			0.418	0.000
	Skin disease			−0.019	0.259
Dependant variable: Days unable to work					
1		0.052	0.003		
	Age			−0.031	0.180
	Sex			0.005	0.825
	Family history of the disease			−0.041	0.072
2		0.120	0.014		
	Severity (IGA)			0.091	0.000
	Skin disease			0.055	0.027

*Age = years; Sex: male = 1, female = 2; Family history of the disease: 1 = yes, 0 = no; Severity (IGA): scale from 0 = not affected to 4 = very severely affected; Skin disease: psoriasis = 0, atopic eczema = 1.

predictors with a higher probability of patients with higher severity grade and with psoriasis to having received systemic therapy.

Discussion

Atopic eczema is a chronic and very burdensome skin disease with a high negative impact on the patients' quality of life. Surprisingly, little data have been published on the quality of care in atopic eczema.

The purpose of this study was to systematically gain health care data for atopic eczema in dermatology offices on a nationwide basis. Consequently, this study provides the first comprehensive outlook on the health care of atopic eczema from the perspective of both patients and dermatologists in Germany.

Major indicators of good quality of health care were derived from previous studies on psoriasis and adapted to atopic eczema.²⁸ When described by objective parameters like SCORAD, there is a considerable proportion of patients suffering from high severity of AE.

Whereas most of the patients consider their treatment-related burden as relatively low, the daily burden of disease seems to be comparatively high: sleeplessness due to itching in about one third of the patients indicates a high disease-related burden and insufficient therapeutic regimes in these cases. About one third of the participants had substantial impairment in their quality of life (32.1%). The fact that 73.1% of the patients believe emotional factors and/or stress to be the reason for exacerbation of their atopic eczema, underlines the importance of psychological factors.

The quality of health care in atopic eczema was evaluated based on process parameters, in particular the compliance with the German national guideline for atopic eczema.¹⁸ It resulted that most patients were treated with therapies recommended by the guideline. In particular, there were a high percentage of patients using topical steroids and emollients in the past five years. Two fifths of patients used, at least once, a topical calcineurin inhibitor. This indicates a lack of application of modern immune modulating therapeutics.

Since guideline-compliant therapies are mostly used but clinical severity and health related quality of life are still below optimum, there is either a need for further development of the existing guideline or a need for optimized application of the

Table 6 Hierarchical multiple regression analyses predicting systemic therapy ($n = 3420$) and inpatient treatment ($n = 3143$)

Model	Variable†	Nagelkerke's R^2	β	SE	P	Odds ratio (ExpB)	CI 95%
Dependent variable: systemic therapy*							
1		0.003					
	Age		0.002	0.002	0.290	1.002	0.998–1.006
	Sex		−0.169	0.069	0.015	0.845	0.737–0.968
	Family history of the disease		0.002	0.004	0.675	1.002	0.994–1.009
2		0.044					
	Severity (IGA)		0.347	0.041	0.000	1.414	1.306–1.532
	Skin disease		−0.521	0.079	0.000	0.594	0.509–0.694
Dependent variable: inpatient treatment‡							
1		0.007					
	Age		0.002	0.003	0.529	1.002	0.996–1.007
	Sex		−0.304	0.089	0.001	0.738	0.619–0.879
	Family history of the disease		−0.007	0.005	0.114	0.993	0.984–1.002
2		0.069					
	Severity (IGA)		0.563	0.052	0.000	1.755	1.584–1.944
	Skin disease		0.056	0.101	0.582	1.057	0.867–1.290

*Systemic therapy: 0 = not received within the last 5 years, 1 = received within the last 5 years at least once.

†Inpatient treatment: 0 = at least overnight stay in hospital within the last 5 years, 1 = no hospital visit within the last 5 years.

‡Age = years; Sex: male = 1, female = 2; Family history of the disease: 1 = yes, 0 = no; Severity (IGA): scale from 0 = not affected to 4 = very severely affected; Skin disease: psoriasis = 0, atopic eczema = 1.

guideline. It is known from clinical practice that there can be a large number of hurdles to effective treatment, starting with the wrong choice of topicals, the lack of combination treatments, the inefficient use of systemic drugs or the lack of targeted treatment. From the patient's side, the lack of adherence and concordance with the drug treatment, the disregard of preventive measures and general unhealthy behaviour may counteract the beneficial effects of medical treatment. In addition, the data of high disease burden in spite of mostly guideline-compliant health care could also indicate the need for better treatments in atopic eczema. In fact, the rate of innovations for atopic eczema in the past decade has been markedly lower than in psoriasis.

Limitations of this study are potential selection effects due to participation bias. It cannot be ruled out that dermatologists who are familiar with the guideline and good treatment of atopic eczema are more likely to have participated. To prevent a strong selection bias, however, this study was conducted in mainly randomly selected practices. Due to the participation rate of about one third of the practices (29%) a participation bias still cannot be excluded. Assuming a stronger participation of those more competent practices, the health care situation of atopic eczema might be overestimated in this study.

Another bias could be the motivation of patients to participate and the phenomenon of social desirability, which cannot be ruled out in any study performed in dermatology offices. Again there is a high probability that a supposed tendency to more positive answers due to social desirability results in overestimation of the health care situation. In addition, the patients of a

dermatologist might be better informed about their disease and innovative treatment options available than patients who are not treated by a specialist. This could contribute to a better quality of life and to an improved healthcare situation of patients in dermatological treatment.

Due to the cross-sectional study design, no longitudinal outcomes can be described. Hence, the study results can only be interpreted based on retrospective information from both physicians and the patients. However, indicators for limited quality of care for a certain group of patients have been found.

In total, this study provides the first data on the health care of atopic eczema in Germany at a national level, indicating the need for better and more effective care in atopic eczema. As with psoriasis, with atopic eczema a better implementation of the guideline and systematic identification of barriers to optimum health care is needed.

Acknowledgement

This study has been supported by Astellas Pharma GmbH, Munich, Germany. We thank the organization for their excellent cooperation.

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