



RESEARCH LETTER

Effects of inpatient rehabilitation for children with atopic dermatitis: a prospective controlled evaluation study

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To the editor

In this study we describe the evaluation of inpatient rehabilitation for children with atopic dermatitis (AD) and their mothers. At the beginning and end of the rehabilitation, mothers of 18 patients were asked about quality of life of their children, their own quality of life and perceived self-efficacy regarding the disease. Severity of AD was scored by a doctor. Data were compared with data of 26 children and mothers of a waiting-list control group (CG). After rehabilitation, severity of AD had decreased significantly. Mothers reported an improvement in quality of life of their children as well as their own quality of life. Improvements were large in comparison with the observed effects in the CG.

Introduction

Atopic dermatitis, an inflammatory skin disease, is one of the most frequent chronic diseases of childhood and adolescence [1]. For the affected children and their families, the disease goes hand in hand with a high level of subjective burden [2,3], with patients suffering above all from night-time scratching and the associated problems falling asleep and sleeping through the night [4]. The parents, and in particular the mothers, are also burdened and restricted by their child's illness [5], with various studies showing that their quality of life too is clearly reduced in comparison with that of parents of healthy children [6–8].

Rehabilitation for AD in childhood is a multifactorial inpatient treatment programme designed in an interdisciplinary fashion [9,10]. In addition to improving the skin symptoms, the goals of

this measure include the attainment of independence in disease management (with the support of the parents for younger children) and an improvement in quality of life.

Rehabilitation research has already produced several investigations into the evaluation of inpatient rehabilitation in childhood AD [e.g. 11,12]. However, evaluation studies which consider the quality of life of children under 8 years and their parents together within the framework of inpatient rehabilitation are lacking. Moreover, as yet, no study has investigated the effectiveness of rehabilitation in childhood AD taking into consideration a CG without treatment.

Methods

In order to examine the effects of the inpatient stay, a quasi-experimental research design with two measurement time points was chosen. The data of the treatment group (TG) were compared with a waiting-list CG. This latter group consisted of parents of children suffering from AD who had already applied to take part in the rehabilitation programme but who would only be admitted to the clinic at a later point in time. Using this type of CG, the children and their parents are most likely to be comparable with persons in the TG in terms of the severity of the disease and the psychological strain. The time intervals for surveying the mothers in the CG were matched to the duration of the rehabilitation programme. A randomized allocation of the patients to the groups was not possible due to organizational reasons.

	<i>n</i> (T1)	Age of children		% of girls	Age of mothers		SCORAD	
		M	SD	<i>n</i> (%)	M	SD	M	SD
Treatment group	18	4.58	1.45	9 (50)	35.28	5.63	50.78	19.62
Control group	26	4.67	1.73	12 (46)	34.08	4.90		

Table 1 Sample description of the children and mothers in the treatment and control group

The quality of life of the children and their parents was measured at T1 and T2 in both the TG and the CG. Due to organizational reasons, the measurement of the degree of severity of the AD was only possible in the TG.

As a measure for the severity of the disease, the SCORAD index (SCORing Atopic Dermatitis) developed by the European Task Force on Atopic Dermatitis [13] was administered to the TG both upon admittance and directly before discharge. The summative total index is comprised of information provided by the doctor on the spread and intensity of the skin manifestations as well as the subjective symptoms of itching and sleep impairment. It can take values between 0 and 103 points.

The health-related quality of life of the children was measured using the questionnaire for measuring health-related quality of life in children and adolescents KINDL in its revised version [14]. For the 4- to 7-year-old children, the assessment by others version of the KIDDDY-KINDL was given to the parents. The scales physical well-being (body) and emotional well-being (mind) were used. The parental questionnaire also encompasses an additional scale (additional) which is specifically adapted to the conditions for very young children. In addition to this core part, a further used instrument was the disease-specific module AD (neurodermatitis) assessing the disease-specific quality of life of the children, and the frequency, strength, and impairment caused by the skin complaints.

To measure the health-related quality of life of the surveyed parents, the disease-specific questionnaire on the quality of life of parents with children suffering from AD LQEN was applied [15]. For the analysis of treatment effects the subscales psychosomatic well-being, satisfaction with medical care, dealing emotionally with the disease and acceptance of the disease were used. Finally, a SEND questionnaire measuring parents' self-efficacy concerning atopic dermatitis of their children [15] was administered.

The evaluation study was conducted in collaboration with two rehabilitation clinics at the North Sea. The duration of stay in the clinics amounts to 3–4 weeks. The treatment on offer to children with AD and their chaperone comprises, in addition to medical advice and topical therapy, bathing and climate therapy, physiotherapy, sport therapy and movement therapy, as well as nutrition and diet advice in the case of existing allergies. In both clinics, AD training for parents is part of the therapy programme. Moreover, groups on relaxation techniques and stress management are offered.

Patients included in the study had not yet reached the age of 8 years at the time point of the first survey. As only a small number of fathers accompanied their children to the clinic, only mothers were included in the study. The SCORAD total value of the child could not amount to less than 20 points at the examination conducted upon admittance. This boundary was set to ensure that the symptoms were sufficiently strongly manifested to enable any improvements to be observed. Eighteen parents took part in

the survey upon admittance to the clinics (T1). Of these, $n = 16$ (89%) also took part in the second survey directly before discharge from the clinic (T2). The results of the CG are based on data from $n = 26$ persons at the first time point and $n = 19$ at the second. The descriptions of the two samples in terms of the ages of children and mothers, gender ratio and SCORAD are shown in Table 1.

Results

Due to the small sample size, the hypotheses of the current work were predominantly tested using non-parametric tests (exact Wilcoxon signed rank test and *U*-test for paired differences). Furthermore, effect size was each determined by Cohen's *d* based on the analogous *t*-tests.

The SCORAD for the children in the TG decreased significantly from T1 to T2 on average by $M = 29.58$ points ($SD = 15.39$) (cf. Table 2). The frequency and strength of the skin complaints as assessed by the mothers as well as the impairment caused by them were significantly diminished following the programme, with large effect sizes also reported here (cf. Table 2). Table 3 shows the average differences ($T2 - T1$) of these variables in the TG and CG. The Mann–Whitney *U*-tests revealed that the strength of the skin complaints and the impairment caused by them reduced significantly more strongly in the TG than in the CG. The effects found are large.

The quality of life of the children in the TG was significantly increased at T2 compared with T1 on the scales additional and neurodermatitis, and the effect sizes *d* can also be described as large (cf. Table 2). The average change in the quality of life of the children in the TG (cf. Table 3) was significantly larger compared with the CG on three scales: body, additional and neurodermatitis. For each of these scales, large effect sizes were found. The health-related quality of life of the mothers in the TG also changed significantly over the course of the rehabilitation (cf. Table 2). On all four scales of the LQEN, significant improvements in quality of life were apparent, the effect sizes are rather large. As shown in Table 3, on three of the four scales of the LQEN, the improvements in the TG are significantly more pronounced than in the CG. Self-efficacy measured by the questionnaire SEND also increased significantly showing a very large effect size.

Discussion

The current study was able to show that the inpatient rehabilitation of young children with AD leads to an improvement in the quality of life of both children and their mothers. This is the first study to have demonstrated these effects in comparison with a waiting-list CG of the same age and with the same diagnosis. Moreover, for the first time, subjective variables were measured in children under 8 years old as outcome parameters. Future studies should confirm

Table 2 Mean values and standard deviations at T1 and T2 as well as examination of the change by means of Wilcoxon signed rank tests (treatment group)

	<i>n</i>	T1		T2		W-S-R test [†]		
		M	SD	M	SD	T _w	<i>P</i>	<i>d</i> [‡]
SCORAD	17	51.76	19.76	22.18	17.93	0.0	0.000*	-1.92
Skin complaints								
Frequency	16	4.06	1.00	3.13	1.20	8.0	0.007*	-0.76
Strength	16	3.94	0.93	2.63	0.96	0.0	0.000*	-1.15
Impairment	16	3.88	0.96	2.44	1.21	3.5	0.001*	-1.06
KINDL ^R								
Body	15	60.83	15.75	72.50	13.32	9.5	0.016	0.64
Mind	16	76.95	12.65	80.86	13.78	35.0	0.145	0.21
Additional	16	58.44	9.96	68.67	12.29	9.5	0.001*	1.10
Neurodermatitis	15	56.55	13.99	80.88	13.70	3.0	0.000*	1.52
LOEN								
Psychosomatic well-being	16	39.32	14.03	60.50	19.12	2.5	0.000*	1.29
Satisfaction with medical care	16	62.08	16.98	75.31	14.77	8.0	0.001*	0.80
Dealing emotionally with the disease	16	49.61	17.60	72.27	17.23	9.0	0.001*	1.20
Acceptance of the disease	16	62.50	22.36	78.13	16.77	5.0	0.001*	1.06
SEND	16	4.08	0.56	4.87	0.65	0.0	0.000*	1.76

[†]Exact Wilcoxon signed rank test: The test is based on ranks, but for reasons of presentation, the mean values and standard deviations are indicated.

[‡]The effect sizes were determined by the *t*-test for dependent samples.

**P* < 0.01 (one-tailed).

Table 3 Means and standard deviations as well as Mann-Whitney *U*-tests for the differences (T2 – T1): treatment vs. control group

	Treatment group		Control group		M-W <i>U</i> -test [†]		
	M _{diff}	SD _{diff}	M _{diff}	SD _{diff}	<i>U</i>	<i>P</i>	<i>d</i> [‡]
Skin complaints							
Frequency	-0.94	1.24	-0.56	1.25	126.5	0.272	-0.31
Strength	-1.31	1.14	-0.06	1.21	69.5	0.004*	-1.07
Impairment	-1.44	1.36	-0.06	1.30	71.5	0.004*	-1.04
KINDL ^R							
Body	11.67	18.28	-8.55	18.19	62.0	0.002*	1.11
Mind	3.91	18.31	1.64	12.30	118.5	0.134	0.15
Additional	10.22	9.32	-0.68	8.36	57.0	0.001*	1.24
Neurodermatitis	24.33	15.97	3.32	11.06	42.5	0.000*	1.50
LOEN							
Psychosomatic well-being	21.18	16.36	1.15	13.88	49.0	0.000*	1.33
Satisfaction with medical care	13.23	16.54	6.05	12.97	102.0	0.048	0.49
Dealing emotionally with the disease	22.66	18.94	5.26	12.72	60.0	0.001*	1.10
Acceptance of the disease	15.63	14.79	-1.39	14.15	54.5	0.000*	1.18
SEND	0.79	0.45	0.03	0.30	18.5	0.000*	2.03

[†]Exact Mann-Whitney *U*-test: The test is based on ranks, but for reasons of presentation, the mean values and standard deviations are indicated.

[‡]The effect sizes were determined based on the *t*-test for independent samples.

**P* < 0.01 (one-tailed).

these results in larger samples. It would also be desirable to follow up a CG over a longer period of time and to recruit other forms of CG (outpatients, patients on holiday). Furthermore, it should be investigated which components of the therapy programme are important for success [16].

References

- Schultz-Larsen, F. & Hanifin, J. M. (2002) Epidemiology of atopic dermatitis. *Immunology and Allergy Clinics of North America*, 22, 1–24.

2. Chamlin, S. L., Frieden, I. J., Williams, M. L. & Chren, M.-M. (2004) Effects of atopic dermatitis on young American children and their families. *Pediatrics*, 114, 607–611.
3. Ben-Gashir, M. A., Seed, P. T. & Hay, R. J. (2004) Quality of life and disease severity are correlated in children with atopic dermatitis. *The British Journal of Dermatology*, 150, 284–290.
4. Dahl, R. E., Bernhisel-Broadbent, J., Scanlon-Holdford, S., Sampson, H. A. & Lupo, M. (1995) Sleep disturbance in children with atopic dermatitis. *Archives of Pediatrics and Adolescent Medicine*, 149, 856–860.
5. Su, J. C., Kemp, A. S., Varigos, G. A. & Nolan, T. M. (1997) Atopic eczema: its impact on the family and financial cost. *Archives of Disease in Childhood*, 76, 159–162.
6. Beattie, P. E. & Lewis-Jones, M. S. (2006) A comparative study of impairment of quality of life in children with skin disease and children with other chronic childhood diseases. *Paediatric Dermatology*, 155, 145–151.
7. Staab, D., von Räden, U., Kehrt, R., Erhart, M., Wenninger, K., Kamtsiuris, P. & Wahn, U. (2002) Evaluation of a parental training program for the management of childhood atopic dermatitis. *Pediatric Allergy and Immunology*, 13, 84–90.
8. Staab, D., von Räden, U., Kehrt, R. & Wahn, U. (2000) The impact of childhood atopic dermatitis on quality of life of the family. *Dermatology and Psychosomatics*, 1, 173–178.
9. Petermann, F. & Warschburger, P. (1999) Neurodermitis. Göttingen: Hogrefe.
10. Scheewe, S., Gieler, U., Fartasch, M., *et al.* (2000) Standards der Neurodermitischulung im Kindes- und Jugendalter. *Kinder- Und Jugendarzt*, 31, 223–228.
11. Petermann, F., Gulyas, A., Niebank, K., Stübing, K. & Warschburger, P. (2000) Rehabilitationserfolge bei Kindern und Jugendlichen mit Asthma und Neurodermitis. *Allergologie*, 23, 492–502.
12. Hampel, P., Petermann, F., Stauber, T., Stachow, R., Wilke, K., Scheewe, S. & Rudolph, H. (2002) Kognitiv-behaviorales Stressbewältigungstraining in der Patientenschulung von Kindern und Jugendlichen mit atopischer Dermatitis. *Verhaltenstherapie Und Verhaltensmedizin*, 23, 31–52.
13. European Task Force on Atopic Dermatitis (1993) Severity scoring of atopic dermatitis: the SCORAD index. *Dermatology*, 186, 23–31.
14. Ravens-Sieberer, U. (2003) KINDLR Fragebogen zur Erfassung der gesundheitsbezogenen Lebensqualität bei Kindern und Jugendlichen – Revidierte Form. In *Diagnostische Verfahren zu Lebensqualität und Wohlbefinden* (eds J. Schumacher, A. Klaiberg & E. Brähler), pp. 184–188. Göttingen: Hogrefe.
15. von Räden, U., Staab, D., Kehrt, R. & Wahn, U. (1999) Entwicklung und Validierung eines krankheitsspezifischen Fragebogens zur Erfassung der Lebensqualität von Eltern neurodermitiskranker Kinder. *Zeitschrift für Gesundheitswissenschaften*, 7, 335–350.
16. Buchholz, H. T., Warschburger, P., von Schwerin, A.-D. & Petermann, F. (2003) SEND: Eine Skala zur Erhebung der spezifischen Selbstwirksamkeit von Eltern neurodermitiskranker Vorschulkinder. *Zeitschrift für Medizinische Psychologie*, 12, 63–68.