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Psychotherapy of attention deficit hyperactivity disorder in adults A pilot study using a structured skills training program

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Abstract In clinical practice many adult patients with attention deficit hyperactivity disorder (ADHD) ask for an additional psychotherapeutic intervention besides the medical therapy. In this paper we present a structured skill training program particularly tailored for adult patients with ADHD. The program is based on the principles of cognitive-behavioral treatment for borderline personality disorder developed by M. Linehan. It was modified to suit the special needs of adult patients with ADHD. In this exploratory pilot study we tested this program in a group setting. The following elements were presented: neurobiology of ADHD, mindfulness, chaos and control, behavior analysis, emotion regulation, depression, medication in ADHD, impulse control, stress management, dependency, ADHD in relationship and self respect.

In an open study design patients were assessed clinically using psychometric scales (Attention Deficit Hyperactivity Disorder Checklist according to DSM-IV, 16 items of the SCL-90-R, Beck-Depression Inventory, visual analogue scale) prior to and following group therapy. This treatment resulted in positive outcomes in that patients improved on all psychometric scales.

Key words attention deficit hyperactivity disorder in adults (ADHD) · psychotherapy · cognitive-behavioral treatment (CBT) · dialectic behavioral therapy (DBT) · skills training

Introduction

Many symptoms of attention deficit hyperactivity disorder (ADHD) in children persist into adulthood with a severity that requires medical treatment [8, 17, 33]. Dopaminergic hypoactivity is generally seen as a crucial pathogenetic mechanism [14, 17]. Furthermore, there is evidence of subtle prefrontal neuropathology in adult patients with ADHD [19].

The most important symptoms in adult patients are attention deficit, emotional instability, disorganized behavior and disinhibition. As patients age, hyperactivity becomes less prominent and disorganization becomes more prominent [4, 8, 17]. In monotonous situations or when poorly motivated, patients typically complain about difficulties in focusing attention and in selecting relevant stimuli. Thus they are regarded as dreamy, distractible, oblivious, and unreliable. Lack of persistence often results in accusations of unreliability and selfishness. Patients often perform poor at college and work in spite of sometimes outstanding capabilities. This often results in frequent job loss, unemployment, social decline and low self-esteem. Furthermore, these patients are prone to interpersonal conflicts due to difficulties in impulse control, emotional instability and limited recognition of social cues.

While sometimes these symptoms and their sequels motivate patients to seek professional help, more often than this, patients are referred to psychiatrists or psychotherapists because of comorbid psychiatric syndromes like depression, anxiety, sleep disturbances or substance abuse [7, 17]. Many controlled studies have focused on medical treatment of adult ADHD [17]. Positive effects of group psychotherapy and coaching are reported [18]. Furthermore, manuals for the improvement of self management [32] are used and self-help groups are established. However, in contrast to childhood ADHD, where behavioral and cognitive-behavioral therapy was evaluated [1–3, 28], to our knowledge there are no controlled studies published in the literature,

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looking at the benefit of psychotherapy in adult patients with ADHD [6].

Even though medical treatment is often effective and the benefit of psychotherapy has not yet been proven, most clinicians working with adult ADHD patients would agree that there is a need for the development of a psychotherapy tailored to suit the special needs of these patients.

In the literature some authors point at a comorbidity between ADHD and borderline personality disorder [7, 12, 20, 24, 25]. In the past we also have seen patients who, fulfilling both the diagnostic criteria for ADHD and borderline personality disorder, responded well to cognitive-behavioral treatment or – in another terminology – Dialectical Behavioral Therapy (DBT) developed by M. Linehan [21, 22].

From a phenomenological point of view there are some similarities between ADHD and borderline personality disorder: deficits in affect regulation, impulse control, substance abuse, low self esteem and disturbed interpersonal relationship are common in both conditions. In ADHD attention deficit is most pronounced in situations which lack external stimulation. In contrast, patients with borderline personality disorder often experience dissociative symptoms when they feel emotionally stressed. From a neurophysiological point of view dissociation in borderline personality disorder might be regarded as a special form of attention deficit [discussion in 12].

Mechanisms of affect regulation, however, differ quite dramatically in the two conditions. Patients with ADHD, the majority being male, often try to regulate their labile emotional balance by excessive sports, sexual behavior, or sometimes impulsive aggressive behavior (“fight or flight”). Patients with borderline personality disorder (generally female, often with posttraumatic stress symptoms), on the other hand, tend to slide into “freezing behavior” or “dissociative states” when being stressed emotionally. The self injurious cutting or burning behavior is then used to put an end to these states of tension.

Given these considerations and our positive experience with DBT in patients with both ADHD and borderline personality disorder, we decided to offer elements of DBT skills training [22] to a group of patients with ADHD alone. For our purpose the treatment manual was modified according to the specific needs of ADHD patients. It was our goal to work through relevant sections in a group therapy setting and to establish, if this procedure is of any use to the adult ADHD patients. As criteria of improvement, self rating psychometric scales were used to measure changes in symptomatology of ADHD, depressive symptoms and overall personal health status.

Methods

Approval for the study was obtained from the local ethics committee. All patients gave written informed consent at the onset of therapy.

■ Test phase

In a first test phase, group therapy was offered to patients with adult ADHD without applying any exclusion criteria and without any psychometric evaluation. In this probationary group therapy, patient satisfaction proved to be high and dropout rate was low (1 of 7 patients). Based on this experience and on the suggestions of the patients, the final manual of the therapy was specified. Then, another session of group psychotherapy based on these modified principles was offered to patients seeking help for ADHD at the outpatient clinic of the Department of Psychiatry and Psychotherapy.

■ Patient selection

Diagnosis of ADHD was established by experienced senior psychiatrists employing a structured clinical interview following the DSM-IV criteria modified for adult patients [4]. The diagnosis and onset of ADHD symptoms in childhood was confirmed psychometrically using the Wender-Utah-Rating Scale (WURS) [29]. Furthermore, the persistence of relevant symptoms into adulthood was established using a self-rating ADHD Check List (ADHD-CL) for adults following the individual 18 DSM-IV criteria symptoms (0 = not present, 2 = severe, minimum score = 0, maximum score = 36).

For patients to be eligible for this study, they had to clearly fulfill DSM-IV criteria for ADHD. In addition a minimum score of 35 in the 25 items of the Wender-Utah-Rating Scale best correlating with ADHD (WURS-25) and a score > 17 in the ADHD-CL was required.

A history of substance abuse in the past 6 months, a lifetime history of bipolar disorder, schizophrenia, mental handicap or borderline personality disorder served as exclusion criteria. In particular, patients with chronic suicidal or self injurious behavior were not included.

The need for inpatient treatment during the psychotherapeutic course or the failure to attend more than 2 sessions without excuse served as dropout criteria.

■ Patients

The treatment program was offered to eleven patients consecutively seen at our outpatient clinic who fulfilled the above mentioned criteria. Of these eleven patients eight agreed to participate (5 males, 3 females, age range: 19–44 years, mean age: 31.9 years (SD 9.0)). Two of the remaining three patients could not comply with the times of the therapy sessions and one patient did not respond at all. Six of the eight patients included fulfilled DSM-IV criteria for the combined subtype of ADHD, 1 patient for predominantly inattentive subtype and 1 patient for predominantly hyperactive-impulsive subtype. In all patients the onset of clinically relevant ADHD symptomatology was assessed to be before the age of 7 years. The WURS-25 scores ranged between 44 and 77 points with a mean group score of 58.0 points (SD 12.1; cutoff > 35) (see Table 2). Comorbid disorders were recurrent depressive disorder (3 patients), social phobia (2 patients) and insomnia (2 patients). Two patients were unemployed at the time of the study, 3 were employees, 2 students, and one patient was self employed. This demographic distribution regarding age, sex, education, and employment status appeared to be fairly representative for the general sample of patients seen at our outpatient clinic. However, due to the small sample size it may not be representative for ADHD as a whole since it is a heterogeneous disorder with a wide range of symptoms, severity and comorbidities.

■ Psychotherapeutic setting

The group was chaired by two psychotherapists being trained in DBT. Participants agreed to a setting with 13 sessions on a weekly base over a period of 3 months each session lasting 2 hours. There was no charge for the participants. Written material and daily exercises were distributed to the participants before and after each session. Participants had the opportunity to ask for additional individual sessions

and were allowed to contact therapists by phone in case of severe crisis.

■ Psychometric scales

The following self rating psychometric scales were used to measure changes in terms of clinical improvement: the ADHD Checklist (ADHD-CL) (see above), the Beck-Depression Inventory (BDI) [5] and an adapted version of the Symptom Check List (SCL-90-R) [13] containing 16 items (of the total 90 items) to our clinical impression relevant for ADHD (SCL-16). The SCL-16 included the following items: item 2 (nervousness), 9 (memory deficits), 10 (carelessness), 11 (excitability), 24 (emotional outburst), 26 (self reproach), 28 (difficulties to start), 41 (inferiority complex), 44 (sleep disturbances), 55 (concentration deficits), 57 (feeling of tension), 69 (embarrassment), 71 (exertion), 78 (restlessness), 79 (worthlessness), 90 (thinking something is wrong with comprehension). The possible scores ranged between zero and four for each item (score 0 = not present, 4 = very severe; minimum score = 0, maximum total score = 68). Finally, a visual analogue scale (VAS) ranging from 0 (worst) to 10 (best) was used [according to 23] to measure the overall personal health status before and after the therapy.

■ Neuropsychological tests

Neuropsychological testing was performed in the treatment group at baseline and following treatment. In an attempt to cover the core neuropsychological deficits of ADHD the following tests were selected:

1. verbal and letter fluency test [9, 26];
2. the Stroop Test [27] indicating mental speed and inhibitory executive functions;
3. the Digit Symbol Subtest of the revised version of the Wechsler Intelligence Test battery [30] testing split attention;
4. the KLT [15], an established test of continuous attention;
5. the d2-Test [10] measuring selective attention; and
6. mental control, digit span and visual memory span of the revised Wechsler-Memory Scale indicating short-term memory, working memory and general attentional capacities [31].

With lack of persistence being one of the deficits of ADHD we kept the neuropsychological test battery brief and abstained from doing a full intelligence battery in order to improve the compliance of the patients.

■ Evaluation

At the end of the course of the treatment, evaluation forms were distributed and patients were asked to rate given statements by checking one of five options (true, rather true, don't know, rather not true, not true) and by doing so rating the psychotherapy. Evaluation was anonymous and did not affect further management in any way. Patients were asked to comment on their opinion regarding the specificity and the effects of the therapy, and to make their suggestions for improving the treatment.

■ Medication

Following a naturalistic design medical treatment was left to the decision of the patients.

Methylphenidate: One patient who was on methylphenidate stopped this medication during the therapy course while another patient not taking any drugs at baseline started on methylphenidate. In total, three patients started and ended the psychotherapy on a medication with methylphenidate (20–50 mg/d).

Antidepressants: One patient was on antidepressant medication (desipramine) when the group started but stopped it during the treatment phase.

■ Control group

A group of 7 patients (5 males, 2 females, age range 18–53 years, mean age: 32.7 years (SD 13.1), WURS–25: 58.6 (SD 15.1)) fulfilling the same criteria was assessed with the same methodology and served as a control group. They were put on a waiting list for our treatment and sent to clinical management in a regular outpatient setting with the recommendation of medical treatment according to the guidelines of ADHD. Furthermore, behavioral therapy was recommended. The agreement was to repeat the psychometric scales after 3 months and to include these patients in the next treatment session about half a year later. Unfortunately, after 3 months 4 of these 7 patients were lost to follow-up due to reasons perhaps closely related to the symptomatology of ADHD. Two of the remaining three had begun a new medication with methylphenidate in the meantime, the other had started reboxetine. Although this control group is compromised by the high drop out rate and medication effects, following respective recommendation, we calculated a group comparison of the treatment effects by carrying forward the last observation.

■ Statistical analysis

In order to analyze structural equality of the treatment and control group, we compared age, and baseline psychometric scores using two-sample t-tests. Possible sex differences were analyzed using the chi-square procedure.

To test for treatment effects within the two groups, the psychometric data before and after therapy were analyzed statistically using the non parametric paired-Wilcoxon test. Effect sizes for treatment effects were calculated by subtracting the mean psychometric scores prior to and after therapy and dividing these differences by the standard deviation of the differences.

A p-value of 0.05 was chosen as the criterion of significance for all comparisons. All data were analyzed using SPSS for Windows (version 9.01).

■ Contents of the therapy

The following therapy elements were integrated as described (for overview see Table 1)

Clarification

Patients with ADHD often do not recognize their problems as a symptom of a “disorder”. Frequently being misdiagnosed, they feel misunderstood in therapies together with other patients and stop attending. A correct diagnosis alone often results in substantial relief since it allows the patients to understand their problems and symptoms as part of a recognized disorder.

In order to prepare the patients in advance and to avoid prema-

Table 1 Overview: Contents of the Therapy

Session Number	Contents
1	Clarification
2	Neurobiology/Mindfulness I
3	Mindfulness II
4	Chaos and Control
5	Dysfunctional Behavior/Behavior Analysis I
6	Behavior Analysis II
7	Emotion Regulation
8	Depression/Medication in ADHD
9	Impulse Control
10	Stress Management
11	Dependency
12	ADHD in Relationship/Self Respect
13	Retrospect and Outlook

ture termination of the therapy, they received written information about their diagnosis of ADHD and the precise goals and sequence of the course of group therapy. The ability to control ADHD rather than to be controlled by ADHD was defined as the overall objective of the course.

In the first session, following a general introduction, patients were educated regarding the symptoms and signs of ADHD. The diagnosis was reestablished for every patient by comparing the general description of ADHD with the individual biography. A general agreement was settled regarding the modalities of the therapy. Finally, the expectations and aims of the participants as well as possible reservations were discussed.

Neurobiology/mindfulness

Attention deficit is one of the primary deficits in ADHD. Many other symptoms derive from it. In the second section patients were educated about the scientific knowledge regarding psychological and neurobiological aspects of attention and concentration.

Subsequently, the concept of mindfulness was discussed and patients were familiarized with training of mindfulness as described by Linehan [22]. Mindfulness skills in Linehan's diction [21] "are central to DBT". They are seen as psychological and behavioral versions of meditation skills in DBT "drawn most heavily from the practice of Zen" [21]. In DBT there are three "what" skills (observing, describing, participating) and three "how" skills (taking a nonjudgmental stance, focusing on one thing at a time, being effective) [22]. Situations in which the patients succeeded or failed to behave in a mindful way were analyzed. In all following sessions patients were asked to train these mindfulness skills and to repeat them on a daily basis as homework.

Chaos and control

Disorganized behavior is one of the core diagnostic criteria of ADHD often resulting in difficulties at school, work and in interpersonal relationships. In the therapeutic context chaos was defined as follows: "Chaos is, if ADHD takes control of me". Control was defined as an antipodal concept: "Control is, when I seize control of ADHD". Following Hallowell and Ratey [18] a list of concrete advice (how to plan a day, how to organize help, etc.) were presented to the patients. Mechanisms how to precisely realize these suggestions in everyday life were discussed.

Dysfunctional behavior/behavior analysis

In this section different behavior patterns were analyzed. Dysfunctional behavior was defined as the kind of behavior patients want to change. The core concepts of behavior analysis (detailed and precise description of the behavior, preceding events, predisposing constellations, consequences, development of alternative strategies, prevention, apology, compensation) were introduced and taught to provide the patients with strategies for independent behavior analysis. Time and again accurate examples of behavior analyses were practiced in the following group sessions.

Emotions

Emotional instability and brief recurrent depressive or dysphoric states or feelings of emptiness are all common in ADHD. In the section "emotions", the patients were first informed about modern theories of emotion (primary emotions, signal and communicatory aspects of emotions, relationship cognition-emotion and emotion-behavior). Following this, exercises of emotional analysis (emotional record, emotional diary) and emotional regulation skills according to Linehan were demonstrated to the group [22].

Depression/medication in ADHD

Patients were taught about the diagnosis and therapy of depressive disorders, since depression is very common in ADHD. Then, the principles of medical treatment of depression and ADHD were explained and every patient had the opportunity to report and discuss his personal experiences with his medication.

Impulse control

Impulsivity and loss of impulse control are further core symptoms of ADHD. The exercises focusing on impulse control started with behavior analyses of situations where loss of impulse control generally occurs frequently. The most common symptom reported in our cohort was difficulty in controlling anger. Short- and long-term consequences of impulsive behavior were discussed and goal-directed behavior was trained again following Linehan [22].

Stress

As mentioned above disorganized behavior is another core symptom of ADHD. Affected patients often feel that this behavior is a result of emotional stress and experience this deficit as stressful in itself. Problems with planning and organizing sequential behavior often result in a situation in which patients with ADHD do several different things at the same time, feel pressurized, and end up finishing none of their projects.

The session focusing on this problem started with education by informing the patients about the stress-performance relation. Subsequently, stress management techniques were trained, which were adapted according to personal resources. Exercises to improve personal stress tolerance were practiced following the DBT manual.

Dependency

Substance abuse is one of the most common comorbid diagnoses in ADHD. Most patients suffering from ADHD have a history of drug abuse. To deal with this problem, patients were educated about symptoms and signs of dependency, effects and side effects of psychotropic substances in ADHD, and the nature and consequences of high risk and dependent behaviors often seen in ADHD (sexuality, high risk sport, internet, etc.). We then practiced behavior analyses focusing on dependent behavior and tried to develop alternative behavioral strategies.

ADHD in relationships/self-respect

The symptoms associated with ADHD render affected patients vulnerable to negative experiences during childhood, at school, university and work. In particular the attention deficit is the reason why many patients do not achieve positions in private or professional life which correspond to their abilities and intelligence. Furthermore, the interpersonal relationships are affected at home and at work commonly resulting in criticism and rejection. This often leads to dramatically reduced self esteem. The effects and consequences of ADHD including possible advantages of the disorder for the individual biography were discussed and patients had the opportunity to share their experiences.

Session with partners and family members

Many families, partnerships and marriages are affected by the symptoms of ADHD of a family member or partner. Hallowell and Ratey [18] vividly describe the problems that often result from ADHD within interpersonal relationships. To address this problem, educational literature about ADHD as well as the content and the objectives of the psychotherapy was handed out to partners and family members. Arrangements were made to meet with partners or families of every participant separately. In these sessions patients and partners had the opportunity to present and discuss their specific problems.

Retrospect and outlook

In the last session the experiences in the therapy were summarized and the next steps were planned (transformation to a self-help group).

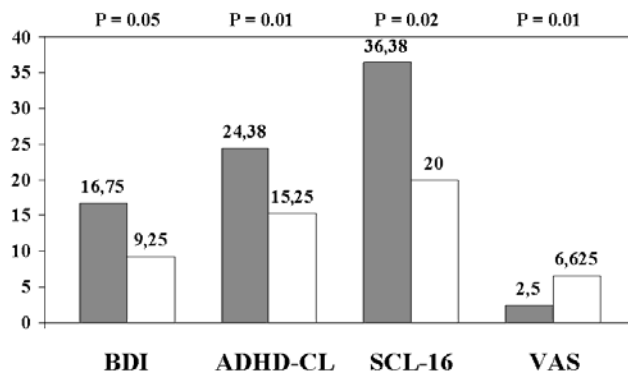
Results

Psychometric scales

Treatment group. After 13 sessions there was a significant improvement on all psychometric instruments used (Table 2; Fig. 1). The BDI score improved from a mean score of 16.8 before (range 10–22) to 9.3 points (range 2–21) after therapy ($Z = -1.96$; $p = 0.05$; effect size (ES) = 0.99). The ADHD-CL decreased from 24.4 (range 20–28) to 15.3 (range 10–20) points ($Z = -2.52$; $p = 0.01$; ES = 2.22). The SCL-16 improved from mean 36.4 points (range 19–51) to 20.0 [14–26] points ($Z = -2.21$; $p = 0.02$; ES = 1.35). Finally, the personal health status rated on the visual analogue scale VAS improved a mean 4.13 points from 2.5 [1.1–4.7] to 6.63 [2.7–8.8] ($Z = -2.521$; $p = 0.01$; ES = 2.09).

Control group. There were no significant differences between the treatment and control group with respect to

Fig. 1 Change in psychometric scores in the treatment group after psychotherapy (grey = pre, white = post)



[grey pre psychotherapy, white post psychotherapy, numbers = mean, BDI Beck Depression Inventory, ADHD-CL Attention Deficit Hyperactivity Disorder Checklist according to DSM-IV (see text), SCL-16 16 items of the SCL-90-R (see text), VAS visual analogue scale to measure the overall personal health status (0 = worst, 10 = best), above: significance, non parametric Wilcoxon-Test]

Table 2 Psychometric assessment of patients in the treatment group before and after psychotherapy (pre/post)

Patient Number	Sex	Age in years	WURS-25	BDI Pre/post	ADHD-CL Pre/post	SCL-16 Pre/post	VAS Pre/post
1	F	37	61	21/2	27/20	45/23	4.3/8.8
2	F	33	46	10/13	22/10	19/19	2.0/6.3
3	F	23	64	22/9	25/17	48/17	1.3/7.3
4	M	42	55	19/9	23/12	51/20	1.2/5.9
5	M	44	47	20/21	20/19	26/26	2.0/2.7
6	M	32	44	10/8	23/13	25/14	4.7/6.8
7	M	19	77	17/9	28/19	40/23	1.1/7.9
8	M	25	70	15/3	27/12	37/18	3.4/7.3
Mean		31.9	58.0	16.8/9.3	24.4/15.3	36.4/20.0	2.5/6.6
[SD]		[9.0]	[12.1]	[4.7]/[5.9]	[2.8]/[3.9]	[11.8]/[3.9]	[1.4]/[1.8]

WURS Wender-Utah-Rating Scale (see text). Pre/post psychotherapy: BDI Beck Depression Inventory; ADHD-CL Attention Deficit Hyperactivity Disorder Checklist according to DSM-IV (see text); SCL-16 16 items of the SCL-90-R (see text); VAS visual analogue scale to measure the overall personal health status (0 = worst, 10 = best); SD standard deviation

age and gender. Furthermore, both groups were well matched regarding the different psychometric scores at baseline which were as follows for the control group (means): WURS-25: 58.6 (SD 15.1); BDI: 16.3 (SD 11.7); ADHD-CL: 24.7 (SD 5.2); SCL-16: 34.4 (SD 18.9); VAS: 3.87 (SD 1.0). With the last observation being carried out in the 4 drop-out cases, the follow-up figures for the control group were BDI: 14.7 (SD 13.2; ES = 0.20); ADHD-CL: 20.9 (SD 6.2; ES = 0.79); SCL-16: 27.3 (SD 15.8; ES = 0.64); VAS: 5.0 (SD 2.8; ES = 0.42).

Neuropsychological tests

Table 3 summarizes our neuropsychological findings. At baseline our patients scored well within the normal range of the respective tests [9, 10, 15, 26, 27, 30, 31]. At follow-up, the treatment phase patients showed significant improvement in terms of selective (d2) and split attention (DSS, Stroop). The number of omissions and mistakes did not change significantly, whereas the psychomotor speed increased in the d2 test. Two patients were unable to manage the calculation tasks of the KLT at the beginning of the treatment. Despite the small resulting n, there was still a tendency towards improvement in this task following treatment. No significant differences were found in the domains of primary and working memory (digit span, visual memory span), fluency and executive functions.

Evaluation forms

The treatment was generally regarded as helpful and, in particular, as very specific for the deficits that patients experienced. Patients felt better educated and felt they were better able to cope with ADHD. All patients stated that the setting as a group was most helpful. Psychoeducation, the therapists, and the exercises were mentioned as further helpful factors in a descending order. The rating of the different therapy modules mentioned above was very heterogeneous; however, none of the modules was assessed as unhelpful.

Table 3 Results of neuropsychological testing in the treatment group (baseline and follow up)

Test	Item	Baseline N = 8		Follow-up N = 8		p	Sign.
		Mean value	SD	Mean value	SD		
fluency		29.00	1.97	29.88	1.44	0.496	
d2	total amount	405.00	54.57	461.75	42.49	0.025	*
d2	number of mistakes and omissions	39.75	25.60	33.50	30.30	0.496	
	variance	16.00	9.65	12.63	2.77	0.310	
DSS		51.42	12.28	58.71	15.19	0.018	*
KLT		110.00	54.79	128.00	46.70	0.075	
Stroop	FWL	34.50	4.50	30.87	4.22	0.018	*
	FSB	50.25	8.43	45.63	5.04	0.017	*
	Interference (time)	81.62	18.65	69.87	9.21	0.093	
WMS-R	mental control	6.00	0.00	6.00	0.00	1.00	
	digit span	13.88	2.95	15.00	2.82	0.105	
	visual memory span	16.50	1.77	17.25	1.39	0.336	

* results with a significance level of $P < 0.05$

When patients were asked to rate the overall therapy following the German school grading system between 1 (=very good) and 6 (=very bad), it was rated with a mean score of 1.4 (range: 1–3). There was no dropout. Following completion of the course the participants decided to continue as a self-help group.

Discussion

In this paper we introduce a structured skill-training program for adult patients with ADHD. The therapy is developed for a group setting. It is based on the principles of dialectic behavioral therapy (DBT) for borderline personality disorder, a cognitive-behavioral treatment according to M. Linehan, and modified to suit the specific needs and deficits of adult patients with ADHD. The different modules follow the core symptoms of ADHD and their psychosocial sequelae.

What are the methodological problems of this study? This is an exploratory pilot study and, therefore, like in psychopharmacological pilot studies, the number of cases is very small. The control group is clearly compromised by the high dropout rate. Thus, we do not want to comment on the differences in outcome between the treatment and control group. Following respective suggestions, we calculated effect sizes for the treatment as well as the control group by carrying forward the baseline observation of those four patients in the control group who were lost to follow-up. Even though this procedure resulted in differences between the two groups in favor of our treatment group, the data should be held with caution. Furthermore, in three patients of our control group, an adequate medical treatment of ADHD was introduced between baseline and follow-up assessment, while in our treatment group there was no overall change in medication. Thus, according to the criteria of the evidence-based-medicine paradigm [16], the level of

evidence of the efficacy and specificity presented is low (level IV) [11]. However, to our knowledge there are no controlled studies looking at the effects of psychotherapy in adult patients with ADHD with a higher level of evidence. Pre-post changes in psychometric scores (for ADHD related domains: ADHD Checklist and SCL-16; for depressive symptoms and overall health status: BDI and VAS) in the treatment group are significant despite the small sample size. Since there was no overall change in concomitant medication with stimulants in the treatment group, this change cannot be attributed to a medication effect. Like in other pilot studies the results are very preliminary in nature. However, they may be used to formulate hypotheses and hopefully encourage further larger and controlled studies.

The improvement in some of the neuropsychological tests does not necessarily translate into an improvement in therapeutic outcome in terms of symptomatology. At baseline the mean patients scores of the tests were within the normal range. Even though the test-retest reliability for all tests used is good (coefficient of stability ranged between 0.67 (DSS) and 0.96 (Stroop)) other effects might explain the post-treatment change. Improvements might be due to practice effects, to a decrease of depressive symptoms, or might be taken as an indicator of good motivation following the treatment phase.

Given that lack of persistence is one of the symptoms of ADHD, it is remarkable that there were no dropouts and no problems with unpunctuality or missings of sessions in our treatment group. Subjective evaluation of participants indicates that they regarded the therapy as specific and effective. The setting as a group therapy, psychoeducation and the continuous practice of exercises were rated as the most helpful factors of the therapeutic process by the patients.

The therapists, on the other hand, felt that the dialectic approach established by M. Linehan in her cognitive-

behavioral treatment of borderline personality disorder was very helpful for the treatment of adult ADHD patients in that it seems to be important to keep the balance between acceptance and validation of the ADHD-related symptoms, on the one hand, and to teach the skills for change and self management, on the other hand.

Finally, we want to stress the fact that there are many differences in the nature and therapy of borderline personality disorder and ADHD. In particular, the absence of chronic suicidality, parasuicidal behavior, posttraumatic stress symptoms and difficulties in establishing a therapeutic relationship in ADHD makes it "easier" to work with these patients and change might be brought about "faster" than in patients with borderline personality disorder.

In contrast to ADHD in adults there are studies evaluating the effects of psychotherapy in childhood ADHD. For example Abikoff et al. consecutively evaluated the effectiveness of eight weeks of intensive behavioral treatment [1] without significant changes in the percentage of hyperactive children classified as normal (except for benefits concerning aggressive behavior). In another 16-week cognitive training program including problem-solving strategies and social skills training Abikoff and Gittelman again did not find significant treatment effects [2]. A third study evaluating a 16-week intensive cognitive training program focussing on academic skills and tasks including attack strategy training as well as problem-solving behavior strategies again was not very effective in childhood ADHD [3]. A recent very large 14-month randomized clinical trial by the MTA study group compared different treatment strategies for childhood ADHD (age 7 to 9.9 years) [28]. As a result, a carefully crafted medical management was superior to behavioral treatment for ADHD symptoms. However, the authors stated that the combination of medical treatment and behavior therapy may have provided modest advantages for non-ADHD symptoms and positive functioning outcomes. Furthermore, the treatment outcomes in the combined condition (medication + behavior therapy) were achieved with significantly lower medication doses [28].

In the case that our findings were replicated in larger study samples, the question would arise why such a cognitive-behavioral treatment protocol is effective in adult patients while in childhood ADHD the benefit is limited. One difference might be that adult patients are more motivated for the therapy, whereas in childhood treatment is generally initiated by parents or teachers. Furthermore, depending on the developmental state, the introspective capabilities of children are limited compared to adults. This, however, might be of importance for a successful cognitive-behavioral therapy. Also, the symptoms inattention and hyperactivity are known to be more prominent in childhood compared to adulthood ADHD, where secondary complications are often more pronounced. At the same time the former symptoms might be more difficult to address with psy-

chotherapy and this constellation might explain the limitation of psychotherapy in childhood ADHD.

Further research in larger samples is needed to evaluate the clinical benefit of psychotherapy in patients with ADHD in adulthood. In addition, such studies should compare psychotherapy to medical and combined treatment and should also address maintaining effects.

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