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Fourteen-Day Inpatient Cognitive-Behavioural Therapy for Insomnia: A Logical and Useful Extension of the Stepped-Care Approach for the Treatment of Insomnia

Tatjana Crönlein, Berthold Langguth, Peter Geisler, Thomas C. Wetter, Peter Eichhammer

Department of Psychiatry and Psychotherapy, University of Regensburg, Regensburg, Germany

Cognitive-behavioural therapy for insomnia (CBT-I) is an effective treatment, covering a wide spectrum of therapy strategies, ranging from computerized forms [1] to standardized outpatient group settings [2, 3]. However, nearly one fifth of all patients fail to benefit from CBT-I programmes [4], presumably partly due to limitations inherent in the outpatient setting, e.g. problems with implementing CBT-I modules into the patient's daily home schedule. Moreover, disease severity (e.g. hopelessness or anxiety) or difficulties in quitting the intake of hypnotics may impede participation. To address these limitations, we have developed an intensified CBT-I programme for an inpatient setting lasting 14 days. This programme was intended to (1) improve diagnostic evaluation by using polysomnography (PSG), (2) offer a more intense treatment approach by combining single and group sessions, (3) relieve patients from their daily routines and responsibilities, (4) ensure better monitoring of proper application of therapy elements and (5) handle potential complications when tapering off hypnotics. In the development of this programme, special emphasis was put on a short duration for socio-economic reasons, feasibility and economic use of therapeutic resources.

The programme comprises a fixed schedule of bedtimes and classical modules of CBT-I such as stimulus control [5], psychoeducational elements and relaxation therapy. The fixed schedule of bedtimes is a variation of the classical bedtime restriction [6]: patients had a fixed time window of 6 h (for example midnight to 6 a.m.) in which they were allowed to sleep only. Patients were closely surveyed and coached in the daily implementation of these elements throughout their hospital stay and they were regularly seen by a psychiatrist and a sleep expert. Two nights of PSG (adaptation and baseline) were performed at the beginning and one at the end of the programme. After each night, the patients were informed individually about the sleep parameters measured in a single session. All patients slept in a 2-person bedroom on the ward, except for the PSG nights in the sleep laboratory.

162 insomnia patients participated in this programme between 2009 and 2012 in groups of 7–8 persons. Its evaluation was approved by the Ethical Committee of the University of Regensburg, and all patients signed the informed consent forms. Before treatment, the patients were interviewed and examined by a sleep expert regarding the following inclusion criteria: (1) diagnostic criteria of primary insomnia for at least 1 year according to the International Classification of Sleep Disorders 2 [7]; (2) evidence of conditioned sleep difficulty and/or heightened arousal in bed, and (3) previous participation in an outpatient CBT-I without success or inability to participate in standard outpatient CBT-I because of disease severity or inability to reduce hypnotics. Exclusion criteria were: (1) untreated organic sleep disorder; (2) severe psychiatric disorders, and (3) inability to participate in a group therapy for any reason. Thirty-one participating patients had to be excluded from the analysis for the following reasons: 4 patients quit the therapy, in 5 patients available data were incomplete and in 22 patients the presence of exclusion criteria (14 with sleep apnoea syndrome, 8 with severe psychiatric disorder) became only apparent during treatment. The remaining 131 patients [mean age 53.6 ± 12.2 years; 110 women; mean Pittsburgh Sleep Quality Index (PSQI) 14.1 ± 3.1] were included in the analysis. The objective measurement of sleep was performed by PSG at the beginning and end of treatment. Subjective insomnia symptoms were quantified at baseline and 6 months after treatment using the PSQI and the Regensburg Insomnia Scale (RIS [8]: a 10-item questionnaire which measures psychological aspects of insomnia over a period of 4 weeks; total range 0–40 points; cut-off for insomnia 12 points) and analysed using paired t tests. Depressive symptoms were assessed by the Beck Depression Inventory. Both PSG data and clinical ratings were compared with paired t tests.

Acceptance of the programme by patients was good; only 4 persons quit the therapy prematurely. All 78 patients on a sedative-hypnotic regimen before treatment stopped their medication during the therapy. After treatment, time in bed (436.5 ± 35.8 vs. 381.8 ± 44.6 min; $t = 11.786$; $p < 0.0005$), sleep latency (15.8 ± 18.4 vs. 8.1 ± 10.7 min; $t = 11.786$; $p < 0.0005$) and wake time after sleep onset (72.9 ± 48.3 vs. 49.8 ± 37.5 min) significantly decreased whereas sleep efficiency (77.2 ± 48.3 vs. 82.3 ± 13.0%; $t = -4.002$; $p < 0.0005$) increased. Total sleep time was shortened (337.9 ± 60.0 vs. 322.3 ± 81.8 min; $t = 2.025$; $p = 0.045$). Clinical ratings at 6 months were available for 97 patients with a significant improvement in the PSQI, the RIS (24.5 ± 5.4 vs. 19.0 ± 6.8; $t = 11.281$; $p < 0.0005$) and the Beck Depression Inventory. The improvement was most pronounced in RIS items 'sleep related thinking' and 'hypnotic intake'. However, in spite of the significant improvements, the mean level of insomnia was still moderate to severe. There was no control group, but repeated baseline assessments of insomnia symptoms were performed with an interval of 4–5 months (RIS 0: 24.7 ± 5.7,

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E-Mail karger@karger.com
www.karger.com/pps

Dr. phil. Tatjana Crönlein
Department of Psychiatry and Psychotherapy
University of Regensburg, Universitätsstrasse 84
DE–93053 Regensburg (Germany)
E-Mail tatjana.croenlein@medbo.de

RIS I: 24.9 ± 5.7) in some of the patients (n = 34). A repeated t test revealed no significant difference between the RIS scores on the two baseline measurements indicating symptom stability before treatment. Six months after therapy there was a significant reduction of the RIS score in this subsample (RIS II: 18.7 ± 6.2; t = 7.930; $p < 0.0005$). Thus, spontaneous fluctuations are unlikely to explain the improvement observed after treatment. However, because of the open study design, potential interference by some unspecified outside influence cannot be excluded.

Nevertheless, the low treatment drop-out rate (3%), together with the favourable results, demonstrate the feasibility and therapeutic potential of an inpatient CBT-I programme. Whether the higher costs of the inpatient CBT-I programme exceed the reduction of socio-economic costs of insomnia should be investigated by a cost-effectiveness study. PSG has been shown to be a valuable tool for revising disturbed sleep perception and for measuring the changes of sleep after therapy. The close medical supervision made it easier for patients to quit their hypnotics. Pending confirmation by controlled trials, inpatient CBT-I could become an important option in the stepped-care management of insomnia described by Espie [9].

Disclosure Statement

This was not an industry-supported study. The authors have indicated no conflicts of interest related to the study.

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