CLINICAL FEATURES

Perception of Sleep and Dreams in Alcohol-Dependent Patients during Detoxication and Abstinence

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Abstract — Aims: This study aims to investigate sleep quality and the subjective dream experience in alcohol-dependent patients during withdrawal and abstinence compared with healthy controls. Methods: Thirty-seven patients with alcohol dependency and 35 healthy control subjects were asked to fill in several questionnaires and to give information about their subjective sleep and dream experiences. Twelve patients participated in a follow-up interview 4 weeks later. Results: Sleep quality is impaired in alcohol-dependent patients during detoxication, and the subjective dream experience is more negatively toned compared with healthy controls. Both sleep quality and dream experience improves slightly after 4 weeks of abstinence. Patients with alcohol dependency during withdrawal and abstinence dream significantly more often about alcohol. However, none of the abstinent alcohol-dependent patients dreamt about alcohol during withdrawal. Conclusions: This study shows that the subjective sleep and dream quality is strongly impaired in patients with alcohol dependency. Differences in the dream experience between alcohol-dependent patients and healthy controls are in accordance with the continuity hypotheses of dreaming. The hypothesis of dreaming about alcohol as a compensatory effect, however, could not be confirmed.

INTRODUCTION

Alcohol in moderate doses decreases the time required to fall asleep and is thus often used as self-treatment for insomnia. However, it has a strong negative impact on sleep quality and sleep architecture. Sleep in patients with chronic alcohol abuse is severely disturbed. Sleep latency and efficiency are decreased, the number of sleep stage shifts and nocturnal awakenings are increased and the total amount of slow wave sleep is reduced (Gillin et al., 1990). The time spent in rapid eye movement (REM) sleep is decreased in the first half and increased in the second half of the night (Vitiello, 1997). Sleep-related respiratory disturbances like sleep apnoea are common in chronic alcoholics and impair the sleep pattern even more (Aldrich et al., 1993; Issa and Sullivan, 1982). Of the total, 36–72% of the patients suffer from insomnia, and the presence of insomnia is closely associated with alcoholic relapse (Brower, 2001, 2003). These significant sleep disturbances are also prominent during acute withdrawal and longer abstinence. Most patients with alcohol dependency suffer from severe insomnia and very long sleep-onset latency during acute withdrawal. Sleep architecture is fragmented and REM-rebound is very likely to occur (Johnson et al., 1990; Osborne, 1969). After 25 days of alcohol withdrawal, sleep efficiency and sleep latency are still significantly disturbed (Snyder and Karacan, 1985). Even in a 12-week follow-up study, subjective sleep quality in abstaining alcoholics continues to be affected (Cohn et al., 2003).

The investigation of dreams in the context of primary alcoholism started with Moore (1962) and Scott (1968), who were the first to investigate the differences in the manifest dream content between patients with alcohol dependency and non-alcoholics. Alcohol-dependent patients seem to be more concerned about their dreams (Schredl, 1999a), which are more negatively toned when compared with those of healthy controls (Cernovsky, 1985, 1986). In a recent study, DeCicco and Higgins (2009) found that dreams provide helpful insights into the mood of recovering alcohol-dependent patients. Choi (1973) identified the occurrence of alcohol in dreams as a good prognostic factor in alcoholism. Dreaming of alcohol might serve a compensatory function and thus prevent possible relapse (Peters, 1997). Araujo et al. (2004) point out that the reporting of a dream can have a therapeutic function in itself. As dreams can indicate the emergence and sources of craving, early identification of possible risk situations is thus possible and can help prevent alcoholic relapse. Therefore, analysis of the dream content might be implemented in the alcohol abuse treatment (Flowers and Zweben, 1998).

However, the comparative investigation of sleep and dreams in alcohol-dependent patients during detoxication and abstinence has only received little attention. The first aim of this study is to determine which subjective sleep perception and dream experiences are associated mostly with alcohol detoxication and abstinence. Secondly, we hypothesize that the dreams of alcohol-dependent patients are more negatively toned compared to the dreams of healthy controls. In patients, we expect dreams to be experienced even more negatively during withdrawal than during abstinence. Thirdly, based on the continuity hypothesis of dreaming, which says that dreams reflect our everyday reality (see Schredl, 1999b for overview), we want to test the hypothesis that alcohol-dependent patients have more alcohol-related dreams than healthy controls. Lastly, if dreaming can serve a compensatory function, dreaming about alcohol should prevent relapse. Therefore, we expect a relation between dreaming about alcohol during detoxication and abstinence.
METHODS

Participants
We investigated a sample of 37 alcohol-dependent patients (23 males; mean age 48 ± 11 years) during their stay at the detoxication ward of the Department of Psychiatry and Psychotherapy. Clinical diagnosis of primary alcoholism was based on the criteria of the International Classification of Diseases (ICD-10). Patients with additional substance abuse or psychiatric diagnosis were excluded from the study. Patients were surveyed on Day 4 or 5 of their stay at the ward. The control group consisted of 35 healthy volunteers (19 males; mean age 50 ± 13 years) who answered to an announcement in the hospital and were mainly employees and visitors. None of them displayed any history of alcohol or substance abuse or psychiatric diagnoses.

Procedure
All patients and healthy control subjects were asked to give their informed consent and information on socio-demographic and drinking-related variables. Afterwards, subjects reported their current mental state for the dimensions ‘no desire to drink alcohol vs. strong desire to drink alcohol’, ‘sad vs. happy’, ‘tired vs. awake’, ‘pessimistic vs. optimistic’ and ‘weak vs. strong’ on a scale ranging from 0 to 100. Furthermore, the following psychometric tests and questionnaires were administered: the Center for Epidemiological Studies Depression Scale (CES-D10; Radloff, 1977) as a self-rating depression scale. A score of 16 or more is considered as the cut-off and marks the prevalence of clinically relevant depressive symptoms. Subjects were also asked to fill in the Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989) to investigate sleep habits and to assess the subjective sleep quality of the preceding 4 weeks. The cut-off score for the PSQI is 5; a score higher than 10 reveals severely disturbed sleep. The Epworth Sleepiness Scale (ESS; Bloch et al., 1999) measures the level of daytime sleepiness with a cut-off score of 10 for clinically relevant increased daytime sleepiness. Finally, subjects filled in a dream questionnaire for the investigation of dream content and dream-relevant aspects (Klösch et al., 1999). In this dream questionnaire, subjects were asked to describe the one dream out of the preceding three nights that they remember the most. Information about dream experience, dream sources and dream content are given by choosing out of the most. Information about dream experience, dream sources and dream content are given by choosing out of the most.

All patients agreed to be contacted by telephone 4 weeks later to be asked to answer the questionnaires mentioned above a second time. However, 20 patients were not available any more after 4 weeks, and 5 refused to participate in the telephonic interview. The remaining 12 patients (32%) were included in the telephonic follow-up interview.

Statistics
Data are reported as mean ± SD. To determine if there were significant differences between the alcohol-dependent group and the control group, we performed Mann–Whitney U tests for at least ordinal scaled variables and Fisher’s exact tests for qualitative variables. We used the Wilcoxon test for related samples and McNemar’s test to analyse differences in the behaviour of alcoholics during detoxication and follow-up. We considered differences significant at *P* < 0.05.

RESULTS

Detoxication
Socio-demographic and drinking-related characteristics
Alcohol-dependent patients and healthy controls did not differ significantly in sex and age. Naturally, the average consumption of alcohol per day of the alcohol-dependent sample just before their stay at the ward was significantly higher than the average alcohol consumption of the healthy controls (*P* < 0.001). The body mass index (BMI) as one risk factor for sleep apnoea, which could account for sleep disturbances, was normal for patients (24.3 ± 4.5) and controls (23.3 ± 2.9). Unemployment was more frequent in alcohol-dependent patients than in control subjects (*P* = 0.003); however, this could be biased by recruitment in hospital with employees and visitors allowed to serve as controls. Alcohol-dependent patients were less often living with a partner when compared with the healthy controls (*P* = 0.004). While none of the healthy control subjects indicated any continuously taken medication, this was not the case for the alcohol-dependent patients who took not only diazepam as withdrawal medication (48.6%) but also other kinds of drugs like antidepressants (37.8%), antihypertensive drugs (16.2%), neuroleptic drugs (10.8%) and anticonvulsants (10.8%). With regard to medical history, alcohol-dependent patients suffered cardiovascular diseases (32.4%), brain trauma (24.3%), seizures (18.9%), liver and pancreatic diseases (16.2%), gastrointestinal discomfort (8.1%), diabetes mellitus (5.4%) and polyneuropathy (2%). Table 1 shows the demographic and drinking-related variables of both groups.

Table 1. Socio-demographic and drinking-related characteristics, of alcohol-dependent patients during detoxication and healthy control subjects (mean ± standard deviation with ranges or percentages in parentheses)

<table>
<thead>
<tr>
<th></th>
<th>Alcohol-dependent patients during detoxication (N = 37)</th>
<th>Healthy control subjects (N = 35)</th>
<th><em>P</em>-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male/female</td>
<td>23/14 (62.2/37.8)</td>
<td>19/16 (54.3/45.7)</td>
<td>N.s.</td>
</tr>
<tr>
<td>Age, years</td>
<td>47.7 ± 11.2 (23–67)</td>
<td>50.1 ± 12.9 (26–74)</td>
<td>N.s.</td>
</tr>
<tr>
<td>BMI</td>
<td>24.3 ± 4.5 (18–36)</td>
<td>23.3 ± 2.9 (17–30)</td>
<td>N.s.</td>
</tr>
<tr>
<td>Unemployed, N</td>
<td>10 (27)</td>
<td>0 (0)</td>
<td>0.003</td>
</tr>
<tr>
<td>Living with a partner, N</td>
<td>5 (13.5)</td>
<td>16 (45.7)</td>
<td>0.004</td>
</tr>
<tr>
<td>Grams of alcohol per day</td>
<td>250.7 ± 156.0 (80–640)</td>
<td>9.4 ± 8.9 (0–28.57)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Duration of dependency, years</td>
<td>10.6 ± 9.4 (0.5–34)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Number of withdrawals</td>
<td>8.4 ± 13.1 (0–50)</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>
content itself was described as ‘strange, foreign’, like ‘from another world’ (P = 0.001). While none of the control subjects remembered a sexual dream in the last three nights, this was true for 24% of the alcohol-dependent patients (P = 0.010). Additionally, dreams of patients with alcohol dependency seemed to be more negatively toned since they were more often described as frightening (P = 0.008). The difference in dreams which were experienced as aggressive slightly failed to be statistically significant (P = 0.052). During detoxication, 21% of the patients had a dream about alcohol, which again just failed to be statistically significant (P = 0.052; Table 3). Most patients who dreamt of alcohol also consumed alcohol in their dreams (83%). This was accompanied by feelings of fear (66%), guilt (50%), helplessness (50%), anger (33%) and frustration (33%).

Apart from alcohol-related dreams, patients reported more often of having dreams about animals (P < 0.001). Furthermore, there was a tendency of alcohol-dependent patients to dream more often about family members (P = 0.052). Alcohol-dependent patients and healthy controls did not differ significantly with regard to the occurrence of strangers, friends, landscapes, buildings or objects in their dreams. While the major part of recallable dreams derived from happenings in the recent past in both groups, the alcohol-dependent patients dreamt significantly more often about events or memories of their childhood (P = 0.009; Table 4).

Abstinence

Three out of the 12 patients who were available for the follow-up investigation 4 weeks after discharge relapsed to drinking and could, therefore, not be included in the further analysis. The remaining nine abstinent patients (four males, mean age 51 ± 10 years) answered the same questionnaires mentioned above in a telephone interview.

Scales and psychometric tests

Compared with their scores during detoxication, abstinent patients did not score significantly different on all five dimensions of the scales ranging from 0 to 100. Although abstinent patients scored lower on their ‘desire to drink
alcohol’ and higher on the dimension ‘sad vs. happy’, these results failed to be significant. However, alcohol-dependent patients during abstinence seem to suffer less from depressive symptoms, as reflected in the lower CES-D10 total score ($P = 0.025$), which fell below the cut-off score of 16. Abstinent patients also showed improvement in their sleep quality but, although their PSQI score was lower during abstinence than during detoxication and fell below the critical score of 10, this difference was not significant. As during acute withdrawal, abstinent alcohol-dependent patients did not seem to suffer from increased daytime sleepiness either (Table 5).

**DISCUSSION**

As expected, subjective assessment of the sleep and mood of alcohol-dependent patients during acute withdrawal was worse compared with healthy controls. As previous studies have shown, sleep disturbances and impairment of objective sleep parameters are quite common in alcohol-dependent patients and during detoxication (Gillin et al., 1990; Johnson et al., 1970). Complementarily, in our study patients during withdrawal reported strongly reduced subjective sleep quality, which was reflected in an average PSQI total score far above the cut-off score. Sleep apnoea as cause for impaired sleep quality does not seem to be a reason since none of the patients reported typical symptoms and the BMI as one possible risk factor lies within the healthy range and did not differ between alcohol-dependent patients and healthy controls. After 4 weeks of abstinence, the sleep quality improved only slightly, which is in accordance with Drummond et al. (1998) who claimed that the sleep of abstaining alcohol-dependent patients takes at least 12 months to improve. However, daytime sleepiness was not increased in patients, either during detoxication or during abstinence.

As reflected in the high total score of the self-rating depression scale (CES-D10), alcohol-dependent patients during acute withdrawal seemed to suffer from clinically relevant depressive symptoms, which was affirmed by the high scores on the sadness, tiredness, pessimism and weakness scales.

In accordance with our second hypothesis, patients with alcohol dependency described their dreams more often negatively toned as reported in previous studies (Araujo et al., 2004; Choi, 1973; Schredl, 1999a). They experience their dreams more often as ‘strange, foreign’, ‘frightening’ and ‘aggressive’ when compared with healthy controls. Whether the greater amount of sexual, libidinous dreams of alcohol-dependent patients was experienced as pleasant or unpleasant needs further inquiry. All associations between dream content and alcohol-dependent patients have been confirmed after adjusting for CES-D10 except for ‘frightening’, which might be a result of sparse and zero cell entries after adjustment. Although patients did not improve significantly on the scales of sadness, tiredness, pessimism and weakness after 4 weeks of abstinence, they scored significantly lower on the self-rating depression scale and even fell below the cut-off score. At the same time, the subjective dream experience changed as well and dreams were described as less strange and less aggressive compared with dreams during detoxication.

Our third hypothesis could be confirmed as well since alcohol-dependent patients dreamt more often about alcohol when compared with healthy controls. There is no correlation between alcohol-related dreams and scores on the ‘desire to drink alcohol’ scale. Hence, dreaming of alcohol is not related to craving. However, this finding is in accordance with the continuity hypothesis of dreaming since patients with alcohol dependency during acute withdrawal are naturally more exposed to the topic as are healthy controls. The hypothesis of dreams serving a compensatory function could not be confirmed since none of the nine abstinent alcohol-dependent patients was dreaming about alcohol during detoxication.

### Table 5. Scores on scales ranging from 0 to 100 and psychometric tests of nine alcohol-dependent patients during detoxication and abstinence (mean ± standard deviation with ranges in parentheses)

<table>
<thead>
<tr>
<th>Dream Source</th>
<th>Alcohol-dependent patients during detoxication ($N = 9$)</th>
<th>Alcohol-dependent patients during abstinence ($N = 9$)</th>
<th>$P$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No desire to drink alcohol</td>
<td>11 ± 12.7</td>
<td>9.1 ± 18.8</td>
<td>n.s.</td>
</tr>
<tr>
<td>Scale sad</td>
<td>24 ± 22.1</td>
<td>51.4 ± 32.4</td>
<td>n.s.</td>
</tr>
<tr>
<td>Scale tired</td>
<td>43.3 ± 38.9</td>
<td>50.3 ± 37.5</td>
<td>n.s.</td>
</tr>
<tr>
<td>Scale pessimistic</td>
<td>63.2 ± 41.2</td>
<td>56.0 ± 38.5</td>
<td>n.s.</td>
</tr>
<tr>
<td>Scale weak</td>
<td>51.5 ± 35.2</td>
<td>60.6 ± 34.9</td>
<td>n.s.</td>
</tr>
<tr>
<td>CES-D10 total score</td>
<td>17.8 ± 7.2 (7–30)</td>
<td>11.8 ± 8.6 (1–29)</td>
<td>0.025</td>
</tr>
<tr>
<td>PSQI total score</td>
<td>12.8 ± 5.4 (5–21)</td>
<td>9.4 ± 4.6 (3–15)</td>
<td>n.s.</td>
</tr>
<tr>
<td>ESS total score</td>
<td>5.8 ± 4.6 (1–15)</td>
<td>6.1 ± 4.8 (1–15)</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

### Table 6. Subjective dream experience of nine alcohol-dependent patients during detoxication and abstinence (number and percentages)

<table>
<thead>
<tr>
<th>Dream Source</th>
<th>Alcohol-dependent patients during detoxication ($N = 9$)</th>
<th>Alcohol-dependent patients during abstinence ($N = 9$)</th>
<th>$P$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiar, known dream</td>
<td>4 (44.4)</td>
<td>6 (66.7)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Strange, foreign dream</td>
<td>5 (55.6)</td>
<td>0 (0)</td>
<td>0.014</td>
</tr>
<tr>
<td>Sexual, libidinous dream</td>
<td>2 (22.2)</td>
<td>1 (11.1)</td>
<td>0.034</td>
</tr>
<tr>
<td>Frightening dream</td>
<td>8 (88.9)</td>
<td>3 (33.3)</td>
<td>n.s.</td>
</tr>
<tr>
<td>Aggressive dream</td>
<td>3 (33.3)</td>
<td>1 (11.1)</td>
<td>0.020</td>
</tr>
<tr>
<td>Dream of alcohol</td>
<td>0 (0)</td>
<td>1 (11.1)</td>
<td>0.011</td>
</tr>
</tbody>
</table>
The major problem was the small number of patients who agreed to participate in the follow-up investigation. Therefore, more studies with larger samples are needed to further investigate the relationship between dreams of alcohol-dependent patients during acute withdrawal and during abstinence to investigate whether dreaming of alcohol can indeed be seen as a good prognostic factor and prevent possible relapse (Choi, 1973; Peters, 1997). However, in our small sample, only one of the nine abstinent alcohol-dependent patients dreamt of alcohol during detoxication, which seems to contradict this hypothesis.

Reasons for the high dropout rate remain speculative, especially since the dropout group of alcohol-dependent patients and those who participated in the follow-up did not differ with regard to drinking characteristics (such as duration of dependency, number of withdrawals, and grams of alcohol per day) or scores on the scales described above (no desire to drink alcohol vs. strong desire to drink alcohol, sad vs. happy, tired vs. awake, pessimistic vs. optimistic and weak vs. strong).

In conclusion, this study demonstrates that the subjective quality of sleep and dreams quality is strongly impaired in patients with alcohol dependency. Differences in the dream experience between alcohol-dependent patients and healthy controls are in accordance with the continuity hypothesis of dreaming. The hypothesis of dreaming about alcohol as a compensatory effect, however, could not be confirmed.

REFERENCES


