DREAMS and DREAMING

Dream Recall in Patients With Primary Alcoholism After Acute Withdrawal

Michael Schredl, Ph.D.

The present study investigated dream recall frequency of 74 male patients with primary alcoholism after acute withdrawal. Patients' dream recall was slightly elevated. This was explained by their increased frequency of nocturnal awakenings and, therefore, supported the arousal-retrievel model of dream recall. The presence of sleep apnea or myoclonia was also associated with heightened dream recall frequency. Evidence was also found for the salience hypothesis, i.e. low emotional balance in the evening was related with dream recall. The finding that abstinent patients were more often concerned with their nocturnal dreams than relapsers and cases reported in the literature are encouraging further research in order to test whether systematic dreamwork is helpful for these patients. (Sleep and Hypnosis 1999;1:35-40)

INTRODUCTION

Alcohol is a substance which strongly affects the sleep pattern. In healthy controls, alcohol suppresses REM sleep, especially in the first part of the night and –after discontinuation– to a REM rebound (1,2). Similar for patients with alcoholism, REM suppression during the drinking period and REM rebound after withdrawal was described in the literature (3,4). Additionally, the sleep of patients with alcoholism lacks of slow wave sleep and is fractionated (short periods of waking and stage 1 sleep). After two or three weeks following acute withdrawal sleep is still poor and a heightened REM density and slightly increased percentage of stage REM was found (5,6). Even one or two years after withdrawal, the sleep of abstinent alcoholics is more fractionated and includes less slow wave sleep than the sleep of healthy controls.

Even the fact that alcohol strongly influences REM sleep pattern and, therefore, is interesting for dream research, very few studies on this topic were reported in the literature (for reviews see 7,8). The research regarding dream recall and alcoholism will be summarized in the following paragraph.

During the drinking period, dream recall is heightened (4) and dream content is more negatively toned than healthy controls' dreams (9,10). After acute withdrawal, dream recall is also intensified (4) and nightmare frequency is elevated (11,12). In contrary, alcoholics with Korsakoff syndrome show lower dream recall frequency (13,14) comparable to findings in patients with dementia (15). A possible explanation for increased dream recall after withdrawal might be the elevated levels of REM sleep, but Wolin and Mello (4) could not find a substantial correlation between dream recall and amount of REM sleep after withdrawal in their sample. In addition, this assumption would not explain the heightened dream recall frequency during the drinking period. Schredl et al. (16) have been demonstrated that patients with insomnia recall their dreams more often that healthy controls and that this difference was mainly due to the frequency of nocturnal awakenings. In view of this finding, it can be hypothesized that dream recall during the drinking period as well as after withdrawal is heightened because of the poor sleep and frequent nocturnal awakenings.

The present study was designed to investigate dream recall frequency of patients with primary alcoholism two to four weeks after acute withdrawal and to analyze factors which might affect dream recall. According the findings of Schredl et al. (16), a heightened dream recall frequency was expected.

METHODS

Participants

Patients. 74 male patients with primary alcoholism were included in the study, i. e. patients with additional mental disorders such as depression or anxiety disorder were

From the Sleep Laboratory, Central Institute of Mental Health, Mannheim, Germany.

Address reprint requests to: Dr. Michael Schredl, Sleep laboratory, Central Institute of Mental Health, P. O. Box 122120, 68072 Mannheim, Germany.
e-mail: Schredl@as200.zi-mannheim.de

excluded. Common diagnostic criteria (DSM IV; 17) were applied. The patients mean age was 42.3±8.2 yr. (range: 23 to 56). All patients participated in a short-term alcoholism program in an open psychiatric ward (3 to 5 weeks).

Healthy controls. Most of the questionnaire data were made available by the test author (18) and comprised 480 men whose mean age was 37.7±10.3 yr. Controls were included if they did not report current complaints associated with sleep. A subgroup of healthy controls (32 men) contributing dream reports underwent a similar procedure as did the patient group, i.e., they spent undisturbed nights in the sleep laboratory with polysomnographic recordings. Also, sleep apnea and periodic leg movements were ruled out. The subgroup consisted of participants in different studies on sleep (19).

Research instruments

Interview. At the time of admission (after the acute withdrawal period) a structured interview was carried out. Various aspects of the drinking history such as duration of illness, amount of alcohol as well as sociodemographic data were elicited.

Sleep questionnaire. The sleep questionnaire (SF-B; 19) comprises 28 items measuring composite scores such as sleep quality (11 items), emotional balance in the evening (7 items), several waking stressors and dream recall frequency over the past two weeks. Dream recall frequency and frequency of nocturnal awakenings are measured by five-point scales (1=never, 2=rare, 3=sometimes, 4=often, 5=very often). The question 'How often are you concerned with your nocturnal dreams during the day' followed this five-point format. Accordingly, the composite scores (averages) ranged from 1 to 5.

Depression measures. During their inpatient treatment, participants completed twice a week the depression questionnaire D-S (20). This questionnaire comprises 16 four-point scales and the sum score can vary from 0 to 48. For each patient, the mean of all questionnaires were computed. Some patients (N = 26) were rated according the Hamilton depression scale (21) at the day before the first laboratory night.

Sleep recordings. Recordings were done from 23.00 to 7.00. In addition to standard measures such as EEG, EEG (horizontal), EMG (chin) and ECG nasal and oral airflow, chest and abdomen movements, blood oxygen saturation and anterior tibialis electromyogram of both legs were recorded. The sleep recordings were scored according to Rechtschaffen and Kales (22).

Procedure

At the time of admission, a structured interview was carried out (see above). After about 17 days (range 7 to 28 days), the patients slept for two consecutive nights in the sleep laboratory. The first night served as adaptation night. The sleep parameter (REM latency, percent of stage REM, REM density) of the second night were included in the analysis. Before the first night, patients completed the sleep questionnaire SF-B. After each night, patients were asked to rate their dream emotions – if recalled – on a three point scale (-1=negative, 0=neutral/balanced, +1=positive). A cumulative index was computed for dream emotions for the two laboratory nights ranging from - 2 to + 2. Patients were drug-free at least seven days before the sleep recording. After 3 months, 6 months and one year, patients were contacted again in order to elicit whether they relapsed or not. A retest with the sleep questionnaire SF-B was carried out in a subsample (N = 23) 9.5±5.4 months (range: 2 to 11 months) after discharge.

RESULTS

Sleep apnea/myoclonus

4 out of 74 patients were diagnosed having a sleep apnea syndrome since their respiratory disturbance index (RDI) exceeds 15 apnea/hypopnea per hour. Similar, 6 patients suffered form periodic leg movements during sleep with an index higher than 15 myoclonia with arousal per

Table 1. Comparison of patients with sleep apnea or myoclonia vs. the rest group

Variable	Patients with sleep apnea/ myoclonia (N = 10)	Patients without sleep apnea/ myoclonia (N = 64)	Statistical test*	p
Age	44.4 ± 5.3	41.9 ± 8.5	t = 0.9	.3076
Sleep quality	3.57 ± 0.43	3.44 ± 0.73	t = 0.5	.6108
Nocturnal awakenings	3.50 ± 0.85	2.97 ± 1.14	z = 1.5	.1463
Dream recall frequency	2.80 ± 0.42	2.32 ± 1.04	z = 1.8	.0391
Concerned with dreams	1.50 ± 0.53	1.75 ± 0.90	z = 0.6	.5688
Dream emotions	0.25 ± 1.26 (N = 4)	-0.08 ± 1.34 (N = 24)	z = 0.3	.7935

*Statistical test: t-test (t) and Mann-Whitney-U-Test (z)

Table 2. Comparison of patients without sleep apnea or myoclonia vs. healthy controls

Variable	Patients (N=64)	Healthy controls (N=480)	Statistical test*	p
Age	41.9 ± 8.5	37.7 ± 10.3	t = 3.1	.0020
Sleep quality	3.44 ± 0.73	4.26 ± 0.52	F = 110.5	.0001
Nocturnal awakenings	2.97 ± 1.14	2.31 ± 0.96	F = 17.0	.0001
Dream recall frequency[1]	2.32 ± 1.04	2.14 ± 0.87	F = 2.2	.0695
Concerned with dreams	1.75 ± 0.90	1.46 ± 0.66	F = 8.8	.0032
Dream emotions[1]	-0.08 ± 1.34 (N = 24)	0.67 ± 1.30 (N = 12)	F = 3.1	.0438

*Statistical tests: t-test (t) and ANCOVA with factor group (depicted) and covariate age
[1] one-tailed

hour. This ten patients were compared to the rest of the group (see Table 1). As expected, dream recall was heightened in patients with sleep apnea/myoclonus. If frequency of nocturnal awakenings (F=2.4, p=.0319) was partialled out, this difference was only slightly reduced (F=2.3, p=.0663). No differences were found for dream emotions and the variable 'Concerned with dreams'.

Comparison of patients with healthy controls

In order to compare the patient group with healthy controls, patients with sleep apnea or myoclonia were excluded. The results are depicted in Table 2. As expected, patients estimated their sleep quality lower and woke up more often than healthy controls. Dream recall frequency was slightly heightened, but failed to reach significance. Partialling out the variable 'Frequency of nocturnal awakenings' (F=11.2, p=.0009), further reduced this difference (F=0.7, p=.1996). On the other hand, substantial differences were found for the variable 'Concerned with dreams', and dream emotions, i.e., alcoholic patients reported more negatively toned dreams and think about their dream during the day more often than healthy controls.

Factors influencing dream recall

Illness-related variables such as days of abstinence, duration of illness and amount of alcohol per day during the drinking period were not related to dream recall frequency (Table 3). Similar, no substantial correlations were found for measures of depression and sleep quality. As expected, frequency of nocturnal awakenings correlated with dream recall although this coefficient was only marginally significant. Low emotional balance was related to high dream recall. The amount of REM sleep was significantly correlated with dream recall in the expected way. In addition, short REM latency and high REM density were related to high dream recall. Interestingly, both measures of depression, emotional balance in the evening and amount of alcohol per day during the drinking period were strongly correlated with the variable 'Concerned with dreams'. A small but non-significant correlation was found for the relationship between depression (self-rating) and dream emotions (r = -.161, p = .2260).

Table 3. Correlations between dream measures and other variables (N=63)

Variable	Dream recall		Concerne with dreams	
	r	p	r	p
Days of abstinence	.186	(.1455)	.164	(.1991)
Duration of illness	.094	(.4614)	.082	(.5249)
Amount of alcohol	.002	(.9880)	.273	(.0304)
Depression (Zerrsen)	.081	(.5270)	.423	(.0006)
Depression (Hamilton) N = 24	.028	(.8976)	.542	(.0062)
Sleep quality	-.070	(.5946)	-.171	(.1914)
Nocturnal awakenings	.176	(.0835)	.157	(.2180)
Emotional balance	-.270	(.0352)	-.268	(.0366)
REM latency	-.350	(0052)	-.147	(.2487)
REM (% Sleep period)	.217	(.0438)	-.094	(.4660)
REM density	.312	(.0128)	.124	(.3312)

One-year follow-up

In Table 4, the comparison between patients who relapsed during the first year with abstinent patients is depicted. Nor differences have been detected. A trend was found for dream emotions which were more negatively toned in the relapse group.

Retest (dream recall)

The results of the retest using the sleep questionnaire are shown in Table 5. Whereas relapsers did not differ from

Table 4. Comparison of Relapsers vs. Non-relapsers (One-year follow-up)

Variable	Relapsers (N=29)	Abstinent (N=19)	Statistical test*	p
Age	41.0 ± 9.2	43.6 ± 8.0	t = 1.0	.3062
Dream recall frequency[1]	2.39 ± 0.96	2.21 ± 1.18	z = 0.7	.4811
Concerned with dreams	1.75 ± 0.84	1.68 ± 1.06	z = 0.6	.5368
Dream emotions[1]	-0.17 ± 1.34 (N = 12)	0.50 ± 0.84 (N = 6)	z = 1.2	.1304

*Statistical test: t-test (t) and Mann-Whitney-U-Test (z)
[1] one-tailed

healthy controls with regard to dream recall and the variable 'Concerned with dreams', clear differences were found for the abstinent patients. These patients recalled more dreams and thought about their dreams during the day more often. For the second variable, the direct comparison between the relapse group and the abstinent group reached significance (Mann-Whitney-U-Test; z=2.2, p=.0315) whereas dream recall was not significantly different (z=1.1, p=.2530).

Table 5. Retest (sleep questionnaire) of relapsers vs. non-relapsers

Variable	Relapsers (N=14)	Abstinent (N=6)	Healthy C. (N=480)
Dream recall frequency	2.36 ± 0.93 [1]	2.83 ± 0.75[2]	2.14 ± 0.87
Concerned with dreams	1.57 ± 0.85 [1]	2.33 ± 0.82[3]	1.46 ± 0.66

Statistical test: ANCOVA with factor patients vs. healthy controls for each group (covariate age)
[1] non-significant, [2]p < .05, [3]p < .001

DISCUSSION

The results indicate that dream recall frequency in patients with primary alcoholism is slightly elevated, and that this elevation –for patients without sleep apnea or myoclonia– could be explained by heightened frequency of nocturnal awakenings. This supports the arousal-retrieval model of dream recall (23) which stresses the importance of arousal (awaking) during or after a REM period in order to store the dream experience into the short-term memory. This concurs with the finding of Schredl et al. (18) that increased dream recall frequency in patients with insomnia is explained by the frequency of nocturnal awakenings and with studies that found a substantial correlation between frequency of nocturnal awakenings and dream recall frequency (e.g. 24). The heightened dream recall of patients with sleep apnea or myoclonia, however, could not be explained by this model since partialling out frequency of nocturnal awakenings did not affect the difference to patients without sleep disorders. This is comparable to the findings of Schredl (19) who found heightened dream recall in patients with sleep apnea and patients with myoclonia in comparison to healthy controls. This difference was also not reduced by controlling the variable 'Nocturnal awakenings'. It can be hypothesized that sleep pattern of these patients is severely disturbed (high amount of arousals) and that patients are more or less adapted to these arousals so that they were underestimated in the self-report measure and, therefore, did not correlate with dream recall frequency.

The finding regarding influencing factors did not confirm a direct effect of the drug itself. Neither days of abstinence nor duration of illness and amount of alcohol during the drinking period were related to dream recall in the period of time after acute withdrawal. The positive correlation between dream recall and amount of REM sleep fits in the arousal-retrieval model since the chance to awake during REM sleep and recall a dream is increased. Further research is needed to explain the negative correlation between REM latency and dream recall since both short REM latencies and low dream recall were often found in depressive patients (25). A plausible interpretation may be that alcoholic patients with depressive moods think more often about their dreams (see Table 3) and that this activity increases dream recall. Several studies have proven the effect that directing one's attention toward dreams increases dream recall frequency (26).

Two studies (27,28) found that high REM density was associated with dream recall. The authors assumed that eye movements were related to cortical activation and, thus, the salience hypothesis (29) stating that more salient dreams are easier to recall was supported. The low emotional balance in the evening as related to dream recall gave further evidence for the salience hypothesis since research has shown that negative presleep mood is followed by more negative and intense dream emotions (e.g.19). On the other hand, negative dream emotions were only slightly related to depressive moods in the present sample. This small correlation coefficient may be explained by a possible laboratory effect since several studies (e.g.30) found less intense dreams after awakening in the laboratory than in a home setting. Since more negatively toned dreams had a stronger effect on morning mood (31) and, therefore, stay more often in the mind of the person during the day, the correlation between the variable 'Concerned with dreams' and depressive moods gave further support for the salience hypothesis.

The more negatively toned dreams of patients with primary alcoholism confirmed earlier findings that nightmare frequency is elevated even after acute withdrawal (11,12,32). The trend that non-relapsers tended to report

more positively toned dreams than relapsers (Table 4) fits in the finding that depressive mood was also a predictor for relapse in this sample (33). Although no substantial difference regarding dream recall between relapsers and non-relapsers were found for the first measurement point, the retest results indicated that abstinent patients tended to recall their dreams more often and, especially, are more concerned about their dreams in comparison to healthy controls as well as relapsed patients. This fits in with several case reports (34-37) that drinking dreams can help the dreamer in developing coping strategies and protect him against relapse.

To summarize, the findings of the present study are encouraging to investigate dream recall and dream content of patients with primary alcoholism in a more detailed way and to test whether systematic dreamwork could help patients to stay sober and to cope with their illness.

REFERENCES

1. *Gresham SC, Webb WB, Williams RL. Alcohol and caffeine: Effect on inferred visual dreaming. Science 1963;140:1226-1227.*
2. *Yules RB, Freedman DX, Chandler KA. The effect of ethyl alcohol on man's electroencephalographic sleep cycle. Electroencephalography and Clinical Neurophysiology 1966;20:109-111.*
3. *Greenberg R, Pearlman C. Delirium tremens and dreaming. American Journal of Psychiatry 1967;124:133-142.*
4. *Wolin SJ, Mello NK. The effects of alcohol on dreams and hallucinations in alcohol addicts. Annuals New York Academy of Science 1973;215:266-302.*
5. *Gillin JC, Smith TL, Irwin M, Kripke DF, Schuckit M. EEG sleep studies in "pure" primary alcoholism during subacute withdrawal: relationships to normal controls, age, and other clinical variables. Biological Psychiatry 1990;27:477-488.*
6. *Gann H, Kiemen A, Klein T, et al. Schlaf und cholinerger REM-Schlaf-Induktionstest bei Patienten mit primärer Alkoholabhängigkeit. Somnologie 1997;1:119-125.*
7. *Kramer M, Roth T. Dreams in psychopathologic patient groups. In: Williams RL, Karacan I, eds. Sleep disorders: diagnosis and treatment. New York: John Wiley & Sons, 1978;323-349.*
8. *Mellen RR, Duffey TH, Craig SM. Manifest content in the dreams of clinical populations. Journal of Mental Health Counseling 1993;15:170-183.*
9. *Sanctis Sde. Die Träume: Medizinisch-psychologische Untersuchungen. Halle: Carl Marhold, 1901.*
10. *Laverty SG. Sleep disorders and dilirium associated with the use of ethanol. In: Macteau PD, ed. A triune concept of the brain and behavior 1973;128-145.*
11. *Cernovsky ZZ. MMPI and nightmares in male alcoholics. Perceptual and Motor Skills 1985;61:841-842.*
12. *Cernovsky ZZ. MMPI and nightmare reports in women addicted to alcohol and other drugs. Perceptual and Motor Skills 1986;62:717-718.*
13. *Greenberg R, Pearlman C, Brooks R, Mayer R, Hartmann E. Dreaming and Korsakoff's psychosis. Archives of General Psychiaty 1968;18: 203-209.*
14. *Cathala HP, Laffont F, Esnault S, Sereni C, Sikson M. Sommeil et reves dans l'amnesie de Korsakoff d'origine alcoholique. Neurophysiologie Clinique 1988;18:173-186.*
15. *Kramer M, Roth T, Trinder J. Dreams and dementia: a laboratory exploration of dream recall and dream content in chronic brain syndrome patients. International Journal of Aging and Human Development 1975;6:169-178.*
16. *Schredl M, Schäfer G, Weber B, Heuser I. Dreaming and insomnia: dream recall and dream content of patients with insomnia. Journal of Sleep Research 1998;7:191-198.*
17. *American Psychiatric Association. Diagnostisches und Statistisches Manual Psychischer Störungen (DSM IV). Göttingen: Beltz, 1996.*
18. *Görtelmeyer R. Schlaf-Fragebogen A und B (Sf-A, Sf-B). In: Collegium Internationale Psychiatriae Scalarum, ed. International Skalen für Psychiatrie. Weinheim: Beltz, 1986.*
19. *Schredl M. Träume und Schlafstörungen: Empirische Studie zur Traumerinnerungshäufigkeit und zum Trauminhalt von schlafgestörten PatientInnen. Marburg: Tectum, 1998.*
20. *Zerssen J.von Paranoid-Depressionskala und Depressionsskala (PD-S, D-S). In: Collegium Internationale Psychiatriae Scalarum, ed. International Skalen für Psychiatrie. Weinheim: Beltz, 1986.*
21. *Hamilton M. Hamilton-Depressions-Scala (HAM-D). In: Collegium Internationale Psychiatriae Scalarum, ed. Internationale Skalen für Psychiatrie. Weinheim: Beltz, 1986.*
22. *Rechtschaffen A, Kales A. A manual of standarized terminology, techniques and scoring system for sleep stages of human subjects. Washington: U. S. Public Health Service, 1968.*
23. *Koulack D, Goodenough DR. Dream recall and dream recall failure: an arousal-retrievel model. Psychological Bulletin 1976;83:975-984.*
24. *Schredl M, Bozzer A, Morlock M. Traumerinnerung und Schlafstörungen. Psychotherapie, Psychosomatik und Medizinische Psychologie 1997;47:108-116.*
25. *Riemann D, Löw H, Schredl M, Wiegand M, Dippel B, Berger M. Investigations of morning and laboratory dream recall and content in depressive patients during baseline conditions and under antidepressive treatment with trimipramine. Psychiatric Journal of the University of Ottawa 1990;15:93-99.*
26. *Schredl M, Montasser A. Dream recall: State or trait variable? - Part I + II. Imagination, Cognition and Personality 1996-97;16:181-210, 239-261.*
27. *Molinari S, Foulkes D. Tonic and phasic events during sleep: Psychological correlates and implications. Perceptual and Motor Skills 1969;29:343-368.*
28. *Goodenough DR, Witkin HA, Lewis HB, Koulack D, Cohen H. Repression interference and field dependence as factors in dream forgetting. Journal of Abnormal Psychology 1974;83:32-44.*
29. *Cohen DB, MacNeilage PF. A test of the salience hypothesis of dream recall. Journal of Consulting and Clinincal Psychology 1974;41:349-355.*
30. *Weisz R, Foulkes D. Home and laboratory dreams collected under uniform sampling conditions. Psychophysiology 1970; 6:588-596.*

31. *Schredl M, Doll E. Emotions in diary dreams. Consciousness and Cognition (in press).*

32. *Scott EM. Dreams of alcoholics. Perceptual and Motor Skills 1968;26:1315-1318.*

33. *Schredl M, Rist F, Dreyer U, Olbrich R. Rückfallprognose bei alkoholabhängigen Männern anhand von Schlafparametern. Somnologie (submitted).*

34. *Choi SY. Dreams as a prognostic factor in alcoholism. American Journal of Psychiatry 1973;130:699-702.*

35. *Reed H. From alcoholic to dream. Voices 1984;20: 62-69.*

36. *Morrison RA. Dream mapping in clinical dependency recovery. Alcolism Treatment Quarterly 1990;7:113-120.*

37. *Denzin NK. Alcoholic dreams. Alcoholism Treatment Quaterly 1988;5:133-139.*