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Brief report

Dream bizarreness and waking thought in schizophrenia

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ABSTRACT

Dream diaries and reports of daytime waking thought were collected from five schizophrenia patients and matched controls. It was more difficult for blind judges to differentiate the patients' than the controls' dream reports from reports of waking thought, and patients reported shorter but more bizarre dreams than did the controls.

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1. Introduction

The relationship — and possible resemblance — between psychotic symptoms in schizophrenia and the normal experience of dreaming is continuously inspiring considerable speculation (e.g. Kelly, 1998; Hobson, 2004). Yet, even though bizarreness of conscious experience is probably the most psychotic-like dimension of dreaming, the relative level of bizarreness in dreams of schizophrenia patients compared to healthy controls remains largely unclear. For instance, Okuma et al. (1970) showed that dream reports of hospitalized schizophrenia patients are shorter and contain less vivid and bizarre imagery than reports from control participants. More recently, Scarone et al. (2008) reported that bizarreness of waking fantasies is much higher in schizophrenia outpatients than in healthy controls, whereas the level of dream bizarreness does not differ between the groups.

In most of the previous studies, it was not explored whether the changes in the schizophrenia patients' subjective reports truly reflect their experiences. Instead, it may well be the case that the patients suffer from cognitive and memory deficits which render reliable retrospective reporting much more difficult for them than for the control participants. Furthermore, the effects of the disease itself, as well as those of the neuroleptic medication, may have profound effects on sleep (Chouinard et al., 2004; Monti and Monti, 2004) and, possibly, on dreaming. Keeping these restrictions in mind, the aim of the present study was to clarify the following open questions regarding sleep and waking mentation in schizophrenia: (1) Do schizophrenia patients have quantitatively less abundant nocturnal mentation than healthy controls, and if so, could this difference be related to the cognitive and memory deficiencies in schizophrenia patients? (2) Is the difference between waking thought and dreaming as great for the patients as for the healthy controls? (3) Is the level of bizarreness in the patients' dreams different than in the dreams of healthy controls?

2. Methods

2.1. Participants

Five male schizophrenia inpatients hospitalized at the Turku Psychiatric Clinic, Turku Mental Health Care, Finland, signed informed consent and participated in the study (see Table 1). Inclusion criteria were: diagnosis of schizophrenia, clearly psychotic mental state, especially with positive symptoms manifested regardless of stable medication, good ability to cooperate and participate in the study, and well-preserved cognitive functioning. None of the patients was working on a regular basis. The control group consisted of five male members of the nursing staff working at the Turku Psychiatric Clinic, matched for age and level of non-professional education.

2.2. Clinical and neuropsychological examination

To exclude sleep disorders and possible complete suppression of REM sleep, all patients were interviewed by a male physician specialized in sleep medicine, and spent one night in a sleep laboratory, where their sleep structure and autonomic and motor activity were monitored by using the Static Charge Sensitive Bed (SCSB) combined with videoanalysis. In order to assess the level of cognitive functioning and to exclude possibly demented participants, both groups were tested with a detailed battery sensitive for detecting mild cognitive deterioration (see Table 1). The ability to report recent perceptual contents from memory was additionally tested by showing the participants a 5-min video film of a continuous story of people in an everyday context and asking them to write down all that they remembered about the film immediately afterwards, in a manner comparable to the reporting of dreams.

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Table 1
Demographic, clinical and neuropsychological background variables.

	Patients			Controls		
Demographic variables	Mean	S.D.	Range	Mean	S.D.	Range
Age	34.8	6.3	26-43	33.2	6.5	27-43
Education	10.8	1.6	9-12	10.6	1.9	8-12
Individual assessment of patients	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5	
Age	32	36	37	43	26	
Diagnosis (DSM III-R)[a]	295.92	295.32	295.12	295.92	295.31	
Clinical Global Impression	6	4	6	6	3	
GAF	30	40	25	30	60	
PANSS: total	121	96	144	109	67	
PANSS: positive/negative/general	37/17/67	19/25/52	34/36/74	29/22/58	12/20/35	
PANSS: hallucinations (item P3)	6	4	6	5	4	
Neuroleptic medication[b]	hal	per, lev	cloz	cloz	zuc	
Medication dosage[c]	400	400	400	800	100	
Duration of illness in years	14	16	18	21	1	
SCSB: sleep latency, min	60	61	27	24	6	
SCSB: total sleep time, min	408	469	621	642	438	
SCSB: AS/IS + QS[d], %	72/28	68/32	36/64	43/57	51/49	
SCSB: WASO[e], min	0	0	12	84	9	
Cognitive Deterioration Score[f]	1	5	3	2	2	
Group-level assessment	M	S.D.	Range	M	S.D.	Range
WAIS: similarities	21.6	1.3	20-23	22.4	3.1	17-25
WAIS: digit span forward	6.2	0.8	5-7	6.8	1.3	6-9
WAIS: digit span backward	5.2	1.3	4-7	6.0	1.4	5-8
WAIS: digit span total	11.4	1.8	9-14	12.8	2.5	11-17
WAIS: digit symbol	42.8	7.9	31-51	59.4	15.8	45-84
WAIS: block design	38.6	11.3	24-48	35.4	4.4	28-40
WAIS: 20 objects naming time	40.4	6.7	30-47	35.2	5.8	28-43
WAIS: 20 objects immediate recall	12.6	1.8	11-15	14.8	1.3	14-17
WAIS: 30 paired word associates*	16.0	2.0	14-18	21.0	2.9	17-25
Benton Visual Memory*	4.8	2.2	2-8	1.8	0.8	1-3
Semantic Fluency	13.0	5.7	7-20	15.4	8.7	7-27
Phonological Fluency	18.4	3.5	14-23	18.6	3.4	14-22
Cognitive Deterioration Score[f,*]	2.6	1.5	1-5	0.4	0.5	0-1
Mini-Mental State Examination	28.2	2.0	25-30	28.8	0.8	28-30

*$P<0.05$.
[a] Records were later reviewed to ensure that DSM-IV criteria were also fulfilled.
[b] Medication: hal — haloperidol, per — perphenazine, lev — levomepromazine, cloz — clozapine, zuc — zuclopenthixol.
[c] Chlorpromazine equivalent dose mg/day.
[d] AS = active sleep, QS = quiet sleep, IS = intermediate sleep.
[e] WASO = wake after sleep onset.
[f] Participant received 'deterioration point' if his performance on any of the WAIS tests or on the Benton Visual Memory test was below 1.5 S.D. compared to norms.

2.3. Collection of dream and waking reports

All participants received detailed written and oral instructions for how to keep a written dream diary after waking up in the morning. The goal was set at five dream reports per participant, and no time limits were imposed. For waking thought reports, each participant was brought five times on different days to a silent and dim room where he was instructed to lie on a bed, relax and let his thoughts wander. After the participant had spent 10 min in solitude, a female experimenter signalled that the time was up and the participant started to write down what he recalled had been going through his mind during the previous 10 min.

2.4. Analysis of dream and waking thought reports

The coded dream and waking reports were submitted to four independent judges who were blind to the origin of the reports and the aims of the study. The judges were requested to classify the reports according to two dimensions: origin (dream/waking thought) and reporter (patient/control). Dream reports were further content analyzed by two judges with the Content Analysis of Bizarreness scale (Revonsuo and Salmivalli, 1995).

3. Results

3.1. Neuropsychological tests and sleep quality

Although the patients can be regarded as cognitively preserved, they received significantly more points on the Cognitive Deterioration Score than the controls ($t=3.1$, $df=8$, $P<0.05$), and they performed significantly worse than the controls in the WAIS Immediate Recall of paired word associates ($t=3.2$, $df=8$, $P<0.05$) and the Benton Visual Memory test ($t=2.9$, $df=8$, $P<0.05$). Furthermore, patients produced significantly shorter reports of the 5-min video film (word count: patients: mean = 54, S.D. = 32, range = 23-103; controls: mean = 122.2, S.D. = 41.5, range = 74-172; $t=2.9$, $df=8$, $P<0.05$). In the SCSB-analysis all patients' recordings included both quiet (correlating with NREM sleep) and active sleep (correlating with REM sleep), and no sleep disorders were detected.

3.2. The length of dream and waking reports

The patients reported on average 6.8 dreams ($n=34$, range = 3-17), the control participants reported the requested five dreams per person ($n=25$). The patients had, on average, 71 words per report (S.D. = 64.5, range = 10-326), and the controls 201 words (S.D. = 114.4, range = 33-443) in their dream reports (Wilcoxon rank-sum test: $W_s=727$, $P<0.001$). By contrast, the patients tended to produce longer reports of waking thought than the controls: 120 (S.D. = 78, range = 20-267) vs. 102 (S.D. = 29, range = 55-157) words per waking report, respectively, but the difference was not significant.

3.3. Content differences in dream and waking reports

The blind judges could not reliably distinguish whether the reporter was a patient or a control. Regarding the origin of reports (dream/waking thought), the judges made only one mistake in differentiating the controls' dream reports from their waking thought reports. The same task was considerably more difficult with regard to the patients' reports: 52.9% of patients' dream reports (vs. 0% of controls') were judged to represent waking thoughts ($\chi^2 = 16.6$, $df = 1$, $P < 0.001$), and 48% of patients (vs. 4% of controls') waking thought reports were judged to be dream reports ($\chi^2 = 10.4$, $df = 1$, $P < 0.01$). The patients' dreams included a significantly greater proportion of bizarre elements than the controls' (33.2% vs. 20.7%, $\chi^2 = 38.1$, $df = 1$, $P < 0.001$), especially, in the bizarreness categories Incongruity ($\chi^2 = 21.3$, $df = 1$, $P < 0.001$) and Vagueness ($\chi^2 = 43.0$, $df = 1$, $P < 0.001$).

4. Discussion

Schizophrenia patients reported shorter dreams than did the matched controls. Arguably, this finding can be attributed to general problems with the access of visual information to semantic processing as well as to the episodic memory deficits seen in schizophrenia (David and Cutting, 1992; Ranganath et al., 2008). Even though the patients in the present study were cognitively relatively preserved, they did have problems with verbal and especially visual memory, as evidenced by neuropsychological tests and deteriorated recall of 5-min video film, which may have abbreviated their dream reports.

Interestingly, the patients produced equally long or even longer reports of waking thought than the controls. Along the same line, Matthews et al. (2008) reported intact and even enhanced waking mental imagery performance in schizophrenia patients, even if their working memory functioning was impaired compared to controls. Scarone et al., (2008) demonstrated that the stream of schizophrenic thought and mentation contains comparable bizarre elements whether or not the patient dreams or is awake, thus making dream and waking reports relatively similar to each other. Even though we did not quantify bizarreness in waking reports, our findings confirm that waking mentation and nocturnal dreams stand much closer in schizophrenia than in the baseline condition of healthy participants.

Even though the patients' dreams tended to be short, it seems that there was a genuine increase in the bizarreness of the patients' dream mentation, especially, as otherwise shorter dream reports tend to be more coherent than longer reports (Snyder, 1970). Such a finding seems to be inconsistent with an earlier proposal that schizophrenia patients have hallucinatory REM-like waking mentation as a compensation for otherwise diminished bizarreness of REM sleep dreaming (Cartwright, 1972). As the previous studies reported the same or even lower bizarreness level in dreams of schizophrenia patients than controls (Scarone et al., 2008; Okuma et al., 1970), replication studies are needed that would consider methodological differences between the studies, including the use of different content analysis methods, the presence or absence of antipsychotic medication, and the recruitment of both inpatient and outpatient groups.

To ensure equal contribution from all dream reports, each report was treated in the present study as an independent observation (for a similar approach, see Stompe et al., 2003). Such an approach appeared to be successful and yielded interesting results, which should be explored further with more focused hypotheses, using larger both-gender samples, including unaffected relatives, balanced amount of reports, and more complex analyses of variance. In addition, it would be important to evaluate participants' interest in dreams, as the lack of motivation may have resulted in the brevity of dream reports in the schizophrenia group. Follow-up studies are also needed that would control the time of the day when waking reports are gathered, would analyze them using the same scales as for dream content analysis, and would compare waking reports elicited by different methods, such as the one used in the present study and the more guiding Thematic Apperception Test (Murray, 1943).

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