Consciousness and Cognition 19 (2010) 977–985

Contents lists available at ScienceDirect

Consciousness and Cognition

journal homepage: www.elsevier.com/locate/concog

NonREM sleep mentation in chronically-treated persons with schizophrenia

Félix-Antoine Lusignan [a,c], Roger Godbout [a,b,*], Marie-Josée Dubuc [a,c], Anne-Marie Daoust [a], Jean-Pierre Mottard [d], Antonio Zadra [c]

[a] Centre de Recherche Fernand-Seguin, Neurodevelopmental Disorders Program, Hôpital Rivière-des-Prairies, 7070 Boulevard Perras, Montréal, Québec, Canada H1E 1A4
[b] Department of Psychiatry, Université de Montréal, Montréal, Québec, Canada
[c] Department of Psychology, Université de Montréal, Montréal, Québec, Canada
[d] Department of Psychiatry, Hôpital du Sacré-Cœur de Montréal, Montréal, Québec, Canada

ARTICLE INFO

Article history:
Received 21 December 2009
Available online 23 October 2010

Keywords:
Schizophrenia
Dreaming
Dream bizarreness
NonREM sleep
REM sleep

ABSTRACT

This study examined the laboratory dream content reported by 14 patients with schizophrenia and 15 controls, with a focus on reports obtained from NonREM sleep. Both the controls' and patients' frequency of dream recall following awakenings from NonREM and REM sleep were similar to values reported for healthy participants. Patients' NonREM sleep narratives were shorter than those from controls. When compared to their reports from REM sleep, both groups' NonREM sleep reports included significantly fewer words and reportable items. The controls were more likely to report a subjective feeling of bizarreness for their REM sleep reports as compared to their NonREM sleep reports. This difference was not observed in patients with schizophrenia. Taken together, these findings suggest few differences between the NonREM sleep mentation of patients with schizophrenia and of controls and that sleep stage cognitive style is comparable in both groups, with NonREM sleep reports being more thought-like, less elaborate and bizarre than REM sleep reports.

1. Introduction

Empirical studies largely support the continuity hypothesis of dreaming which asserts that dream content reflects various psychological parameters of the dreamer's waking-life (Kramer, Roth, Arand, & Bonnet, 1981; Schredl & Hofmann, 2003). For instance, several aspects of life experiences have been demonstrated to influence dream content such as elements of the pre-sleep situation (De Koninck & Brunette, 1991; Goodenough, Witkin, Koulack, & Cohen, 1975), life events (Cartwright, Lloyd, Knight, & Trenholme, 1984), stress (Breger, Hunter, & Lane, 1971), personality dimensions (Schredl, Schäfer, Hofmann, & Jacob, 1999), and psychological well-being (Pesant & Zadra, 2006). In addition, waking state psychopathological symptoms such as psychotic symptoms have been shown to correlate with corresponding dream content (e.g. bizarre elements) (Schredl & Engelhardt, 2001).

These empirical and clinical observations suggest that continuity should similarly exist between the waking cognitive organization of patients with schizophrenia and their recalled dream content. Much of the laboratory work that attempted to identify dream particularities pathognomonic of schizophrenia was based on experimental awakenings from Rapid Eye

* Corresponding author at: Sleep Laboratory & Clinic, Hôpital Rivière-des-Prairies, 7070 Boulevard Perras, Montréal, Québec, Canada H1E 1A4. Fax: +1 514 328 3533.
E-mail address: roger.godbout@umontreal.ca (R. Godbout).

1053-8100/$ - see front matter © 2010 Published by Elsevier Inc.
doi:10.1016/j.concog.2010.09.021

Movement (REM) sleep, and the results have been both variable and inconsistent with regards to the continuity hypothesis (Kramer, 2000; Kramer & Roth, 1979). Given that NonREM (NREM) sleep dream reports are generally considered as being more thought-like than typical REM sleep dream reports (Foulkes, 1967; Nielsen, 2000), NREM sleep dream reports may be more likely than REM sleep dream reports to directly reflect patients' waking thoughts and concerns. For instance, both Foulkes (1967) and Cartwright and Ratzel (1971) reported that healthy individuals with elevated scores on the schizophrenia scale of the Minnesota Multiphasic Personality Inventory (MMPI) tend to have high dreamlike fantasy scores in their NREM sleep dreams. Moreover, a comparison of REM sleep dream reports and NREM sleep dream reports in drug-naïve schizophrenic patients and control individuals revealed a significant difference in the degree of dream bizarreness between REM sleep and NREM sleep dream reports in controls but not in patients with schizophrenia (Cartwright, 1972). These findings were interpreted as reflecting the fact that, as psychological disturbance increases, qualitative discrimination in cognitive bizarreness between REM sleep dream reports and NREM sleep dream reports becomes reduced. Therefore, it can be suggested that NREM sleep dream reports of patients with schizophrenia may reflect some of their psychopathological features.

We recently showed that, when compared to the laboratory-based REM sleep dream narratives of healthy individuals, the REM sleep dream narratives from chronically treated patients with schizophrenia are shorter, with quantitative differences on several content scales (e.g., fewer familiar characters, more strangers, fewer neutral emotions, a trend for fewer familiar settings) (Lusignan et al., 2009). We also found that patients with schizophrenia spontaneously rated their dream narratives as being less bizarre than did controls despite a similar density of bizarre elements as scored by external judges. These findings were interpreted as reflecting waking neurocognitive processes specific to schizophrenia.

2. Aims and hypotheses

Starting from the hypothesis that NREM sleep dream reports may be more likely than REM sleep dream reports to directly reflect patients' waking thoughts and concerns, and the fact that waking thought patterns of patients with schizophrenia differ from those of healthy controls, we sought to investigate differences in the content of NREM sleep dream reports obtained from patients and controls. We thus investigated their NREM sleep dream content using experimental awakenings from stage 2 NREM sleep recorded in the sleep laboratory. Particular attention was paid to bizarreness in patients' NREM sleep dream reports, a measure presumed to reflect some of the cognitive characteristics associated with schizophrenia. Differences between NREM sleep and REM sleep dream reports were also explored to assess potential sleep stage dependent cognitive styles in schizophrenia as compared to healthy individuals.

As reported in the literature (Cartwright, 1972; Debieve, Bedoret, Meaux, & Fontan, 1977; Okuma, Sunami, Fukuma, Takeo, & Motoike, 1970), we predicted that when compared to controls, the content of laboratory NREM dream reports from patients with schizophrenia would show: (1) a lower word count per dream narrative; (2) fewer reportable items; and (3) a higher level of dream bizarreness. We also predicted that, when compared to controls, patients with schizophrenia would show (4) a lower frequency of dream recall and more "white dreams" (impression of having dreamt without explicit recall) from both REM sleep and NREM sleep awakenings. As shown in laboratory-based awakenings from REM and NREM sleep (Nielsen, 2000), we predicted that when compared to their REM sleep counterparts, NREM sleep dream reports from patients with schizophrenia and controls would include (5) a lower word count per dream narrative, and (6) fewer reportable items. Finally, in accordance with Cartwright (1972), it was predicted that (7) more dream bizarreness and a greater proportion of subjective feeling of bizarreness would characterize control participants' REM sleep dream reports as compared to their NREM sleep dream reports, but these differences were not expected in the patient group.

3. Methods

3.1. Participants

The experimental group was comprised of 14 patients with schizophrenia (13M, 1 F; mean age = 25.5 years, SD = 3.2, range: 20–30; highest level of education obtained = 11.7 ± 0.4) recruited from an ambulatory clinic specializing in schizophrenia within a large urban general hospital. Patients met DSM-IV-TR (American Psychiatric Association, 2000) diagnostic criteria for schizophrenia, as made by the patients' treating psychiatrist. All patients were under atypical antipsychotic medication with one participant taking adjuvant medication. Information on each participant's medication and dosage is presented in Table 1. Exclusion criteria were comprised of suspected drug abuse, the presence of neurological disorders, sleep disorders, or any other psychiatric diagnosis as determined by a psychiatric interview.

The comparison group included 15 healthy controls (12M 3 F; mean = 22.3 years, SD = 4.2, range: 18–31; highest level of education obtained = 12.9 ± 0.4) recruited through advertisements in the community. They completed a questionnaire on past health disorders, medical and psychiatric diagnoses, treatments and hospitalization. Exclusion criteria were a personal history of psychiatric, neurological or sleep disorders, a chronic or current illness, a recent history of shift work, evidence of drug abuse, or current use of CNS-active drugs. The two groups differed by 3.2 years for mean age ($p = 0.03$) and by 1.2 years for education level ($p = 0.049$).