



Original Article

Fight or flight? Dream content during sleepwalking/sleep terrors vs rapid eye movement sleep behavior disorder

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ABSTRACT

Objective: Dreams enacted during sleepwalking or sleep terrors (SW/ST) may differ from those enacted during rapid eye movement sleep behavior disorder (RBD).

Methods: Subjects completed aggression, depression, and anxiety questionnaires. The mentations associated with SW/ST and RBD behaviors were collected over their lifetime and on the morning after video polysomnography (PSG). The reports were analyzed for complexity, length, content, setting, bizarreness, and threat.

Results: Ninety-one percent of 32 subjects with SW/ST and 87.5% of 24 subjects with RBD remembered an enacted dream (121 dreams in a lifetime and 41 dreams recalled on the morning). These dreams were more complex and less bizarre, with a higher level of aggression in the RBD than in SW/ST subjects. In contrast, we found low aggression, anxiety, and depression scores during the daytime in both groups. As many as 70% of enacted dreams in SW/ST and 60% in RBD involved a threat, but there were more misfortunes and disasters in the SW/ST dreams and more human and animal aggressions in the RBD dreams. The response to these threats differed, as the sleepwalkers mostly fled from a disaster (and 25% fought back when attacked), while 75% of RBD subjects counterattacked when assaulted. The dreams setting included their bedrooms in 42% SW/ST dreams, though this finding was exceptional in the RBD dreams. **Conclusion:** Different threat simulations and modes of defense seem to play a role during dream-enacted behaviors (e.g., fleeing a disaster during SW/ST, counterattacking a human or animal assault during RBD), paralleling and exacerbating the differences observed between normal dreaming in nonrapid eye movement (NREM) vs rapid eye movement (REM) sleep.

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1. Introduction

The two main parasomnias (i.e., rapid eye movement sleep behavior disorder [RBD] and arousal disorders) have contributed to recent developments in dream research. RBD is a model of dream-enacting behavior. Middle-aged subjects with incomplete muscle atonia during rapid eye movement (REM) sleep displayed complex and often violent behaviors from an attempted enactment of distinctly altered, unpleasant, action-filled, and violent dreams in which the individual is confronted, attacked, or chased by unfamiliar humans or animals [1]. When the last remembered dream

(whether or not it is enacted) is retrospectively evaluated, the reports involve a higher level of aggression, a frequency of animal involvement, and less sexual content in subjects with symptomatic or idiopathic RBD compared to control subjects [2].

In contrast, when dream reports were prospectively collected during 3 weeks using dream diaries in subjects with idiopathic RBD and control subjects, the levels of aggression in the dreams was similar in both groups [3]. Most of these subjects are treated with clonazepam, which may decrease the level of aggressiveness in dreams. Dream diaries of subjects with Parkinson disease (PD) (with and without RBD) show higher aggression in the dreams than in control subjects [4], which correlates with frontal cognitive dysfunction [5]. These findings lead to the hypothesis that RBD corresponds to the release (by a lack of frontal blockade) of archaic defense behaviors by central pattern generators [2,6]. However, nonviolent behaviors (e.g., laughing, clapping, singing, giving

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lectures, smoking), which are associated with normal nonarchaic dreams, also have been described in RBD. This finding suggests that complex learned behaviors and dreams also exist in this condition, though they are less frequent [7].

In contrast, the sleep mentations associated with sleepwalking and sleep terrors (SW/ST), which occur during a dissociated state between N3 sleep and arousal, have only recently been studied [8]. These mentations have been considered to be rare or absent for a long time [1]. Most adults during SW/ST occasionally remember dreamlike mentations over a lifetime span, consisting of a single visual scene in which the dreamer self is a victim of a misfortune. The action in dream corresponds to the observed behavior. Case reports confirm this isomorphism in sleepwalkers in the sleep laboratory context [9]. Similar dream-enacting behaviors, though less frequent and not monitored (we thus ignore the sleep stage, though the behaviors are reminiscent of mild arousal disorders), have been described in the postpartum condition of healthy young mothers and in the healthy young student populations [10,11].

Whether or not the dream contents differ between these two conditions has not been yet formally studied and may provide clues on the cognitive processes and types of threats experienced during sleep. We consecutively interviewed subjects with SW/ST and RBD regarding their dream contents associated with parasomniac behavior and analyzed and compared their reports.

2. Methods

2.1. Subjects

We consecutively recruited patients between May 2011 and October 2011. All patients with SW/ST and with RBD were referred to the sleep disorder unit of a university hospital for dangerous, disturbing, or frequent nocturnal behaviors. All of the patients accepted the interview. The subjects with SW/ST met the criteria of International Classification of Sleep Disorders which defined SW as a history of ambulation during sleep; the persistence of sleep or impaired judgment during ambulation; and the disturbance not being better explained by another sleep, medical, mental, neurologic disorder, or medication (Fig. 1) or drug use. ST was defined as a history of a sudden episode of terror occurring during sleep, usually initiated by a cry or loud scream with sympathetic and behavioral manifestations of intense fear; difficulty in arousing the person, or mental confusion when awakened from an episode, or complete or partial amnesia from the episode, or dangerous or potentially dangerous behaviors; and the disturbance not being better explained by another sleep, medical, mental, neurologic disorder, or medication or drug use [1]. In addition to these clinical criteria, we observed at least one of the following features on the video PSG in all subjects (although these features were neither totally sensitive nor specific, they were supportive in the context of a systematic study): (1) at least one arousal during N3 sleep was associated with an abnormal motor behavior suggesting surprise, confusion, or fear (e.g., startling, sitting in the bed, or looking around surprised); or (2) sudden arousals during N3 sleep. For simplicity, we indifferently referred to subjects with SW/ST as sleepwalkers. Nocturnal frontal lobe epilepsy was ruled out by an interview of personal and family history combined with absence of epileptic activity on the extended electroencephalogram (EEG) during the 20 hours (two periods of 10 h) of sleep monitoring, especially at sleep-wake transitions visualized with 20-second periods, nonstereotyped aspect of the behavioral and motor episodes, absence of head version or dystonic postures or movements, and exclusive occurrence of motor events on emerging from N4 and never from other sleep stages. The presence of enacted

dreaming during SW/ST also was evidence that frontal lobe epilepsy was not present in subjects.

The subjects with RBD met the international RBD criteria including, a clinical history of complex, vigorous, violent, or injurious behavior during sleep frequently associated with dream mentation; enhanced chin muscle tone during REM sleep; and simple or complex behaviors on video PSG during REM sleep [1]. In both parasomniac disorders, subjects with sleep apnea syndrome (apnea-hypopnea index > 15) were not included. A single subject with arousals from N4 exclusively caused by flow limitations was not included. Subjects with arousal disorders and idiopathic RBD were drug naïve. Subjects with RBD and PD received their usual dopaminergic treatment. All subjects gave their consent to take part in the study, which was accepted by the local ethics committee (CPP Paris IDF 6).

2.2. Study design

2.2.1. Clinical interview and psychological scales

All subjects underwent a semistructured interview that included an assessment of the clinical history of the disease, age at onset, family history, and predisposing factors. The frequency of the parasomniac events was scored as once a week (transcribed in a continuous scale of one), 2 to 3 times a week (mean, 2–3, 2.5), or more than three times a week (mean, 4–7, 5.5). The subjects completed two self-administered questionnaires including the hospital anxiety and depression rating scale [12] and the aggression questionnaire (AQ) [13]. The AQ measured the individual's aggressive response and his or her ability to channel those responses in a safe and constructive manner. The AQ is a self-reported questionnaire consisting of 34 items; each item was scored on a scale from one to five resulting in several dimensional subscores including, physical aggression (nine items, resulting in a subscore ranging from 9 to 45), verbal aggression (five items, 5–25), anger (seven items, 7–35), and hostility (eight items, 8–40). The total AQ score ranged from 29 to 145, with a pathologic score of 96 or higher.

2.2.2. Lifetime-enacted dream collection

We asked the subjects to report any mental content (dream report) associated with a dream-enacted behavior and to describe the motor behavior they have experienced over their lifetime. These narratives were recorded and transcribed.

2.2.3. Collection of dreams enacted in the sleep laboratory

The subjects spent one or two nights in the sleep laboratory with video and sleep monitoring. Two nurses supervised the monitors during the night. The nurses reported their observations on a sheet log but were instructed not to interfere with the subject's sleep unless they were in danger, asked for help, or lost several important leads, as this was considered a routine diagnostic procedure. When they had to enter the room for a potentially dangerous motor event, they collected the sleep mentation associated with the event. Otherwise they waited until the morning awakening to collect the dream mentation that had been associated with motor events in the preceding night. After this spontaneous mentation report the nurses asked the subjects to describe the setting of the dream and its emotional valence. These narratives were recorded and then transcribed.

2.2.4. Dream report analysis

Two independent scorers (GU and ANFR), who were blind to the SW/ST vs RBD conditions, analyzed the dream reports. They measured the length of the reports using the total recall count as the sum of all words that had directly referred to the dream [14]. We eliminated all repetitions and hesitations as well as the content that

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