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Introduction to Images in Sleep Medicine

This section, *IMAGES IN SLEEP MEDICINE*, is intended to tap a relatively unique feature of sleep science: images that have great educational and conceptual content. These could be, for example, electroencephalograms, electromyograms, polysomnograms, portable devices, actigrams, scans including functional images, pathology specimens, brain slice preparations, fluorescent microscopy and other cutting edge techniques. The source may be human or non-human, but the clinical relevance should be clear. Illustrations must consist of clear and high-quality, black-and-white or color-digitized images. At this stage, videos can be submitted only for online publication.

The message accompanying the picture may be a maximum of 500 words, with no more than 5 references. It is especially important not to try and make a case report out of these submissions, and detailed clinical (as contrasted to image) analysis should be avoided. The material should be submitted on the Sleep Medicine website (www.ees.elsevier.com/sleep). Images can be embedded within a text document such as Microsoft Word, a slide program such as Microsoft PowerPoint, or converted to Acrobat files.

Authors should expect that the images will be available for use (with acknowledgement) to the general sleep community for teaching purposes, and so copyrighted/patentable material should be avoided. In its final form, these images will be a freely available, searchable digital teaching image library. Comments regarding the images should be sent by e-mail to the section co-editors within a month of the publication date. These comments will be summarized and posted, if determined to be of educational content, with the original image on the journal's web site, expected to be active for content soon.

We hope this section will be enriched by the contributions of our colleagues who wish to offer stimulating opportunities for discussion and new insights in the field of sleep.

Liborio Parrino
E-mail address: liborio.parrino@unipr.it

Robert Thomas
E-mail address: rthomasl@bidmc.harvard.edu

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Writing emails as part of sleepwalking after increase in Zolpidem

Fouzia Siddiqui [a,b,*], Edgar Osuna [a], Sudhansu Chokroverty [a]

[a] *Seton Hall University School of Graduate Medical Education, New Jersey Neuroscience Institute at JFK Medical Center, 3000 Arlington Ave, Toledo, OH 43614, USA*

[b] *Neurology Department, University of Toledo Medical Center, 3000 Arlington Ave, Toledo, OH 43614, USA*

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* Corresponding author. Address: Neurology Department, University of Toledo Medical Center, 3000 Arlington Ave, Toledo, OH 43614, USA. Tel.: +1 419 383 3838; fax: +1 419 383 3903.
E-mail address: drfsid@yahoo.com (F. Siddiqui)

1. Introduction to the case

Sleepwalkers have been described to be involved in complex motor activities like cooking, eating, driving a car, playing an instrument, stabbing and murder [1]. We describe a case of a 44-year-old woman with idiopathic insomnia almost all her life.

She tried various medications, psychotherapy and behavioral techniques for the treatment of her insomnia without any significant effects. She was started on Zolpidem 10 mg 4 years ago. She was able to sleep 4–5 h each night, but then the effects started wearing off. She increased the dose of Zolpidem by herself to 15 mg every night; she would take 10 mg tablet around 10 p.m. and 5 mg around 3 a.m. With this regimen she started sleeping for 5 h every night and felt alert during the daytime. After increasing the dose, she began to have episodes of sleepwalking. During one such episode, she went to bed around 10 p.m., she woke up 2 h later, and walked to the next room on the same floor. She turned on the computer and connected to the internet. She logged in by typing her user ID and password to her email account. She sent three emails to her friend inviting her to come over for dinner and drinks (Fig. 1A and B). Her friend called her the next day to accept the invitation. She said that the emails had strange language. The patient was not aware of these emails. She checked her sent folder and found three emails sent at 11:47 p.m., 11:50 p.m. and 11:53 p.m. They were in upper and lower cases, not well formatted and had strange language. She was shocked when she saw these emails, as she did not recall writing them. She did not have any history of night terrors or sleepwalking as a child. Her overnight video polysomnogram did not capture any episode and was normal. She was advised to reduce her dose of Zolpidem; after which she did not have any more episodes of sleepwalking.

2. Image analysis

Fig. 1A shows an e-mail sent at 11:47 p.m. during an episode of sleepwalking. Note strange language, errors in grammar, format and text. Fig. 1B shows an e-mail sent by the patient three minutes after the first e-mail during a sleepwalking episode.

3. Discussion

Sleepwalking or somnambulism has been described after ingestion of benzodiazepines, lithium, neuroleptics and other sedatives including Zolpidem [2]. A full range of behavior is seen in sleepwalking from simple and isolated action (e.g., sitting up, mumbling, walking in a daze) to complex semi-purposeful acts (e.g., driving an automobile, rearranging furniture, violence, inappropriate sexual act, playing musical instruments). Our patient

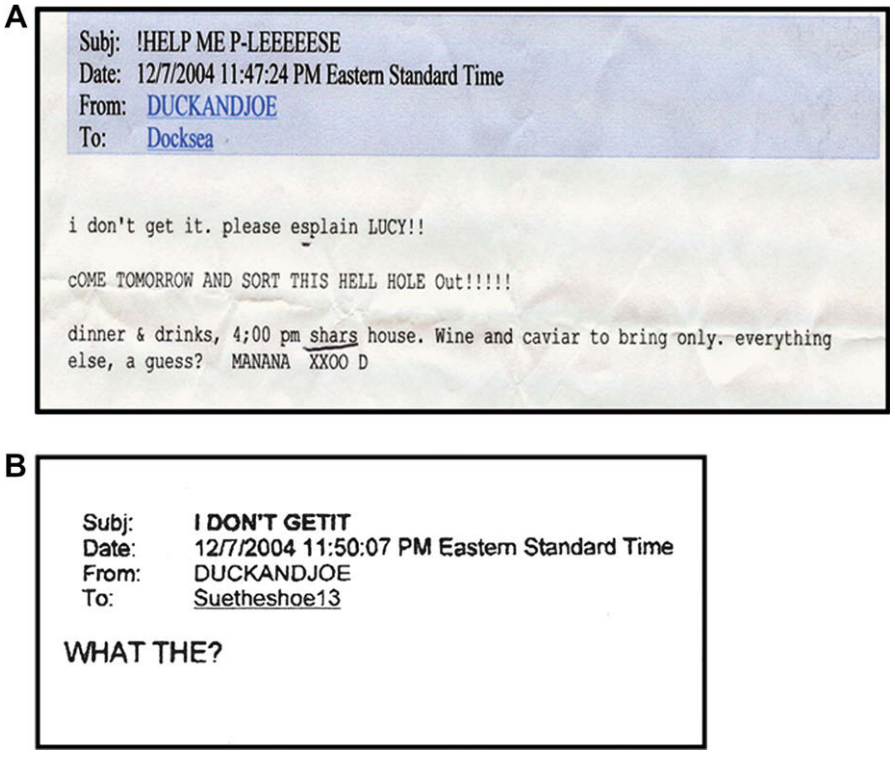

Fig. 1. (A) Emails written by patient during an episode of sleepwalking. (B) Emails written by the same patient three minutes after the first e-mail (A) during an episode of sleepwalking.

displayed an episode of complex cognitive behavior requiring coordinated movements such as typing, composing and writing emails. She performed the sequence of events in a state of unawareness. We believe the activity (e.g., writing an email after turning the computer on, connecting to the internet and remembering the password) displayed by our patient is novel. To our knowledge this type of complex non-violent cognitive behavior requiring coordinated movements (e.g., typing, composing and sending emails) has not been reported before in sleepwalking. The patient was amnesic of the event at night. However, she did not have amnesia about her password and the technical ability to turn the computer on and connect to internet. Zolpidem in a dosage above the therapeutic recommendation apparently triggered this patient's sleepwalking episodes associated with complex information processing and written language during partially aroused states. It is important not to exceed the recommended dosage of any hypnotic medication. Deactivation of thalamocortical arousal system with activation of thalamocingulate pathway as noted in the SPECT scan of a patient during an episode of sleepwalking may provide the physiological background for such complex behavior in this patient [3].

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