

1 **Abnormal Sexual Behavior During Sleep in Temporal Lobe Epilepsy: A Case Report**

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6 **SUMMARY**

7 Herein, we describe a case presented with abnormal sexual behaviour during sleep. Video-
8 electroencephalography monitoring during sleep revealed an abnormality suggesting an
9 epileptic basis. The patient was successfully treated with carbamazepin. The psychiatric
10 symptoms that were thought to be related to abnormal sexual behaviours were controlled with
11 antipsychotic treatment. Our findings strongly emphasize the fact that efforts should be spent
12 to increase awareness of seizure activity at night, which can be misinterpreted as benign
13 parasomnias. Such a misinterpretation may have serious consequences, such as insufficient
14 seizure control, progressive personality changes, and cognitive impairment.

15 **Keywords:** sexual behaviour during sleep, nocturnal seizure, temporal lobe epilepsy,
16 sexsomnia

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18 INTRODUCTION

19 In clinical practice, the differential diagnosis of attacks occurring during sleep should be made
20 by neurologists, particularly epileptologists. The range of possible diagnoses includes sleep
21 disorders, psychiatric disturbances, and epileptic seizures.[1] These attacks may follow
22 different behavioural patterns including bizarre motor behaviour, autonomic activation or
23 abnormal sexual behaviour. Sexual behaviour during sleep includes masturbation, sexual
24 fondling, anal and oral sex, as well as heterosexual and homosexual intercourse, all typically
25 presenting in peculiar or bizarre circumstances; i.e. covers almost all aspects of human sexual
26 behaviour.[2] There is an expanding set of sleep disorders and other nocturnal disorders
27 associated with abnormal sexual behaviours or the misperception of sexual behaviours.[3]
28 Herein, we report a patient masturbating during sleep. Diagnosis was established after a
29 detailed clinical and neurophysiologic examination.

30 CASE REPORT

31 A 31-year-old man was admitted to the Outpatient Clinic of the Department of Neurology
32 with complaints of muscle contractions, meaningless talk, taking off his clothes, and atypical
33 sexual behaviours during sleep. His past medical history revealed no neurological or
34 psychiatric disorders before the onset of the complaints. His medical history started eight
35 years ago with laughing, striking to the wall and clapping his hands during sleep. These
36 behaviours occurred three to four times a night and at any time during the night. Some of
37 these episodes was characterized with masturbation, unintelligible talk, moving around, and
38 visual and auditory hallucinations that lasted approximately 15 minutes. During the episodes,
39 he was not able to recognize anybody even his sons, and it was almost impossible to stop him.
40 Sometimes these behaviours occurred during daytime napping. He imitated animal sounds,
41 such as the meow of a cat or the bray of a donkey. His body was contracted but he did not
42 turn black and blue or have incontinence.

43 Following the onset of the complaints, behavioural changes as well as personality changes
44 occurred. There was a marked increase in his libido. He was convinced that all women were
45 in love with him so he asked to have sex with almost all of the women around him, without
46 caring who they were. He lost almost all of his friends because of his inappropriate and
47 aggressive behaviours. He was not able to work and earn money. He was admitted to a
48 psychiatrist two years after the onset of the symptoms for the first time, and treatment was
49 started with ziprasidone 60 mg per day. Because no improvement had been noted in his
50 symptoms despite four months of treatment with ziprasidone, he was admitted to another
51 psychiatrist who established the diagnosis of psychomotor epilepsy. The patient was started
52 on valproic acid and topiramate polytherapy, and further dose adjustments were made in small
53 increments. The patient was on irregular treatment for four years, including some periods
54 without any medication. He started to lose his consciousness for about 15 seconds whenever
55 he felt excited. He did not turn black and blue or have urine incontinence during these
56 periods. His symptoms were refractory to treatment. He had a convulsion just for once when
57 he neglected his treatment. He turned purple and remained unconscious with foamy salivation
58 for about one hour.

59 Video-electroencephalography (VEEG) monitoring and polysomnographic recordings during
60 sleep were planned when the patient was admitted to the Outpatient Clinic of the Department
61 of Neurology in our hospital. Nocturnal VEEG revealed an episode of masturbation during
62 sleep. During that particular episode, hypersynchronous delta waves with a frequency of 2-3
63 Hz together with muscle artefacts that were more prominent on the anterior temporal and
64 temporal regions were observed (fig 1). There was no evidence of pathological signs
65 indicating epileptic activity during episodes of masturbation. Out of the masturbation episode
66 EEG revealed neuronal hyperexcitability in the right temporal area (Figure2). Cranial
67 magnetic resonance imaging (MRI) showed that the sylvian fissures were enlarged, and the

68 cortical sulci were deeper than normal bilaterally. The patient underwent a battery of
69 neurocognitive tests that revealed impaired attention and memory. Psychiatric evaluation with
70 the dissociative experiences scale (DES) eliminated the possibility of a dissociative state. His
71 DES score was found to be 7.8. Valproic acid therapy was discontinued after appropriate dose
72 adjustments made in small decrements. The patient was started on carbamazepine. Topiramate
73 was continued in the same dose (250 mg daily), and the dose of carbamazepine was increased
74 to 1200 mg daily. His complaints occurring during sleep completely disappeared with this
75 treatment; however, he started being suspicious and jealous of his wife. He was told to
76 become very aggressive even losing his control, giving harm to his wife and children.
77 Risperidone (4 mg daily) was added to the treatment regimen for the treatment of new
78 symptoms. His suspicious and aggressive behaviours were improved with risperidone therapy;
79 however, the patient started to complain about a decline in sexual functions. His prolactin
80 level was 40.3 nmol/L (normal reference range, 3.46-19.4 nmol/L). He was also complaining
81 about feeling unhappy and exhausted. Extrapyrimal signs and symptoms were considered to
82 be complications of risperidone therapy. Due to the complications of the therapy, risperidone
83 was switched to aripiprazole therapy (10 mg daily). The dose of carbamazepine was increased
84 to 1500 mg daily while the dose of topiramate was reduced to 175 mg daily. On his last
85 control visit, it was noted that his complaints disappeared with treatment, and there was no
86 evidence of an active pathologic process. The patient was scheduled for regular follow-up.

87 **DISCUSSION**

88 The difficulties in distinguishing nocturnal epileptic seizures from parasomnias reflect just
89 one aspect of the intriguing issue of the physiopathological relationships between all types of
90 paroxysmal motor behaviours during sleep. In fact, the aetiopathogenesis of nocturnal
91 phenomena, even events of different aetiology, i.e. epileptic or non-epileptic in nature that can
92 coexist in the same subject is a matter of debate.[1]

93 In complex partial seizure, it is possible to misinterpret an abnormal sexual behavior during
94 sleep as a parasomnia episode. Such a misinterpretation may lead to insufficient seizure
95 control, misdiagnosis, and progressive cognitive impairment.[4] Herein, we describe a case
96 presented with masturbation episodes, walking around and non-sense talking during sleep
97 like a “somnambulism plus” events. Previously two cases (one male, one female) were
98 reported by Guilleminault et al. that there were abrupt and violent masturbation episodes
99 recurring during the night. In that report, one patient had no previous history of epilepsy and it
100 was shown that there was a right mesiofrontal focus activity on the EEG and good response to
101 the antiepileptic treatment(5). Seizures arising in the right temporal lobe are more likely to
102 cause orgasm or sexual automatisms.[6] The occurrence of the behaviours at any time during
103 the night, multiple occurrences of the episodes, the short duration of the episodes, and the
104 excellent response of the patient to carbamazepine therapy supported the epileptic basis in our
105 patient.

106 Various clinical features of sexsomnia, including sexual vocalization and talking,
107 masturbation, sexual fondling, and sexual intercourse have been described. The great majority
108 of the cases of sexsomnia in the literature are males.[7] The differential diagnosis of
109 parasomnia is established by nocturnal EEG and polysomnography (PSG) recordings with
110 video monitoring. These techniques enable neurologists to eliminate the possible diagnosis of
111 nocturnal epileptic seizures, especially nocturnal frontal or temporal lobe seizures. Since
112 sexual hyperarousal, ictal orgasm, and ictal sexual automatisms are also seen in sleep-related
113 seizures, it is difficult to distinguish sexsomnia from sleep-related seizures. In our case, the
114 possible diagnosis of sexsomnia was not clearly ruled out by nocturnal EEG with video
115 monitoring. Because, hypersynchronous delta waves as in our case were not considered as a
116 specific EEG findings for the events associated with parasomnia, although some reports

117 presented a burst of hypersynchronous delta waves appearing just before the abnormal
118 behaviour and persisting the initial part of the events (8).

119 Chronic change in personality is very common in temporal lobe epilepsy. Behavioural
120 changes typically follow the onset of seizures. These changes may continue for years and
121 gradually get more intense.[9] The dramatic personality change with increased viscosity,
122 anger, and sexuality was clearly observed in our case. His past medical history revealed no
123 psychiatric disorders, thus the appearance of psychotic symptoms following the cessation of
124 nocturnal seizures using carbamazepine might have resulted from a forced normalization.

125 Frontal and temporal lobe epilepsies comprise the largest group of pure sleep epilepsies.
126 Recent evidence indicates that secondary generalization during sleep is less prominent in
127 frontal than temporal lobe epilepsies.[1] Several authors have shown that sleep organization is
128 more severely disrupted in patients with temporal lobe epilepsy than patients with
129 extratemporal lobe epilepsy. Sleep improvement is likely to play a role in the therapeutic
130 effects of antiepileptic drugs. Among all conventional antiepileptic drugs, both acute and
131 chronic administration of carbamazepine provides the most effective stabilization of sleep
132 patterns in healthy controls, and in epileptic patients. Touchon et al. [9] showed in patients
133 with temporal lobe epilepsy that sleep disturbance was improved with carbamazepine therapy.
134 The sleep-stabilizing effect of carbamazepine might have lead to improvement in this patient.

135 In conclusion, distinguishing nocturnal seizures from parasomnia is often difficult and
136 sometimes imposible on clinical grounds alone. Efforts should be made to increase awareness
137 of seizure activity at night with using V-EEG, polysomnography and response to the medical
138 treatment.

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163 **FIGURE LEGENDS**

164 **Figure 1.** Nocturnal EEG shows hypersynchronous delta waves during the episode of masturbation

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185 **Figure 2.** Right temporal neuronal hyperexcitability in periods outside of the masturbation episode

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