

A Case of Refractory Insomnia Responding to Modified Electroconvulsive Therapy

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Abstract

A 42-year-old female patient suffered refractory insomnia. A variety of drugs including anti-anxiety, antidepressants, antipsychotics and repetitive transcranial magnetic stimulation (rTMS) have been applied in the treatment with no significant effect, whereas modified electroconvulsive therapy (MECT) can significantly improve the patient's sleep.

Keywords

Insomnia, Modified Electroconvulsive Therapy, Major Depression

1. Introduction

Based on the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text revision (DSM-IV-TR), the diagnosis of insomnia is defined by a duration of at least 1 month and by symptoms that do not occur exclusively during the course of another sleep disorder, mental disorder, or medical disorder or result from use of substances or medications. The resistant or refractory insomnia can be defined if insomnia treatment with three different treatment options is unsuccessful. The traditional treatment of insomnia includes the use of benzodiazepines and non-benzodiazepine hypnotics [1]. Newly developed compounds such as GABA receptor subtype-selective compounds (S)-3-(aminomethyl)-5-methylhexanoic acid (Pregabalin) may overcome the side effects and the risk of drug dependence of classical benzodiazepine [2]. Melatonin, a physiological hormone involved in sleep timing, is currently used exogenously in the treatment of primary and secondary sleep disorders [3] [4].

Beyond drug treatment, clinicians started to explore other effective therapeu-

tic way including physical stimulation, for example, the modified electroconvulsive therapy (MECT) [5]. MECT is a technically improved electric shock treatment, which is done under general anesthesia and muscle completely relaxed, while monitoring multiple body function parameters including blood pressure, Electroencephalography (EEG), pulse oxygen saturation and respiration.

The MECT has been clinically proven to be a relatively safe physical therapy in psychiatric treatments with fewer complications [6] [7]. Because of its curative effect and relative safety, MECT is widely used in clinical treatments such as schizophrenia (presence of delusions, hallucinations, mania and stupor) and severe depression especially in patients with suicidal tendencies. Recently, it has been reported that MECT has a certain effect in the treatment of severe paradoxical insomnia [5]. However, MECT on long-term refractory insomnia has not been reported. Recently, a long-term insomnia patient was admitted in our hospital and treated with MECT, which showed good response. We here report this case.

2. Case Report

Chief Complaint: “More than eight years of poor sleep, worsen in recent three months”

Case history: a 42-year-old female patient came to see doctor at the outpatient department in our hospital in December 2014. Patient claimed her poor sleep appeared in 2008, presented as difficulty in falling asleep, shortened sleep time and light sleep, due to tense relationship between patient and her husband. She normally slept for 3 - 4 hours at night, sometimes sleeplessness overnight. At daytime, she felt irritated, depressed and headache which seriously affected her performance in the daily work. The patient had a long-term administration of diazepam which was not effective for these symptoms. In 2011, the patient got divorced. Due to the frequent intimidation of her ex-husband, patient claimed that she can only sleep about two hours per night, had fear at night and depressed, accompanied by recurrent skin diseases: seborrheic dermatitis and eczema. In 2012, she went to the doctor at Ningxia mental health Center and was prescribed mirtazapine, clonazepam. After intermittent administration of the two drugs for six months, the patients still suffered poor sleep quality and quit the medicine due to large side effect. In December 2014, the patient went to our hospital clinic, complaining poor quality of sleep at night, with only two hours of sleep per night.

Physical examination: clear consciousness. Answers to questions were in the point. The mood is low, but no suicidal thoughts.

EEG: brain electrical activity mapping (BEAM) examination and evoked potentials showed no abnormality in mismatch negativity waveform latency, suggesting that in the absence of active attention condition, the brain automatic classification (automatic processing) function to novel stimulation is normal. P300 (P3a, P3b) and N200 (N2) are positive peak waveform that appeared 300

milliseconds after stimulation and negative waveform 200 - 350 ms after the stimulation respectively, reflecting a variety of cognitive functions such as information processing, reaction, attention and memory. Mild prolonged latency of these waves was observed, suggesting the declined function of control processing, orientation activities and cognition. Contingent negative variation (CNV) demonstrated that the increased arousal level caused attention disorders in the process of expected psychological reaction.

Auditory gating evoked potential P50 (Sensory gating is a normal function of the brain in which the brain inhibits irrelevant sensory stimulation input, so that the advanced function of brain cannot be overloaded by irrelevant stimulation): $S2-P50/S1-P50 > 0.5$ suggested the brain sensory gating (capacity of resisting disturbance) was missing and the brain cannot rule out irrelevant information.

EEG examination showed increased α waveform in front head. The main component of basic rhythm was the low amplitude α frequency waveform (9 - 10 times/sec) combined with β frequency waveform (14 - 28 times/sec) and the scattered θ waveform (4 - 7 times/sec) with a poor amplitude modulation and no bilateral significant difference.

3. Drug and TMS Therapy

Daily oral administration of escitalopram (an antidepressant) 20 mg and Clonazepam (benzodiazepine class of anti-anxiety drugs) 4 mg for two weeks showed poor curative effect and the patient still only sleep 2 - 3 hours per night. Then, drug treatment was combined with transcranial magnetic stimulation (rTMS) at the right frontal lobe dorsolateral area (1 Hz, 80% of motor threshold), once a day, five times a week, and the treatment last for 12 weeks. The patient undergone this therapy still suffered poor night sleep. Afterwards, tandospirone (anxiolytics), venlafaxine extended release tablets (antidepressants), olanzapine (an antipsychotic) and other drugs were applied with poor curative effect. On November 2015, the patient was recommended to undergo MECT treatment and she agreed to the treatment. Clonazepam administration was stopped right before MECT treatment, but escitalopram was taken 10 mg daily.

4. MECT Treatment

The first MECT therapy was initiated on November 23, 2015, the therapy lasted for 6.5 seconds at a power of 35 J along with drug treatments: atropine 0.5 mg, propofol 80 mg, succinylcholine chloride 45 mg. The moderate convulsion lasted for 116 seconds. The second convulsion lasted for 5 second was observed 10 seconds after first convulsion. The patient was fully awake about 15 minutes after the therapy with good mood and left the treatment room accompanied by a family member.

The patient slept eight hours with good sleep quality at the first night after the therapy. In the following 24 days, she did not undergo MECT treatment and can sleep 4 - 5 hours per night. The 2nd MECT treatment was performed in the 25th

day, the treatment power was set at 30 J and power-on time was 5.6 seconds considering the twice convulsion in the first treatment. The convulsive symptom lasted for 120 seconds and EEG showed epileptiform discharges.

The 2nd MECT regimen was performed 3 times per week for 2 weeks. Then, the treatment regimen was changed to once a week for 3 times. During the treatment, the patient slept 4 - 5 hours per night with significantly improved mood, alleviated fatigue during the day, normal performance in daily life. After a total of nine treatments, a polysomnography test was performed which showed that the total sleep time was 4 hours 17 minutes, 60.2% of the total recorded time.

So far, the treatment has been stopped for more than 6 months. The patient claimed no sense of fear, 4 - 5 hours sleep time per night with good mood, normal performance in daily work.

5. Discussion

MECT is widely used in the treatment of severe schizophrenia [8] and depression [9] [10]. Less data indicate that MECT can be used in the treatment of insomnia. Insomnia is associated with feelings of restlessness, irritability, anxiety, and daytime fatigue and the symptoms resolve spontaneously after a few days or weeks [11]. However, chronic or refractory insomnia, lasting for three months or longer can reduce individual's function both socially and professionally. Insomnia is believed to be precursor and concurrent symptoms [12] of clinical depression [13]. The treatment of insomnia is an important step in complete alleviation of depression [14].

MECT has achieved good effect in the treatment of severe paradoxical insomnia and depression. However, the patient with chronic insomnia in this case did not have typical symptoms of depression and she mainly suffered chronic insomnia accompanied by the symptoms of fear and slight anxiety. Although the patient has applied drug therapy or drug combined with TMS therapy, it is clear that these treatments had no significant effect on this intractable insomnia. Here, MECT therapy significantly improved sleep quality in a long-term intractable insomnia patient (from 2 hrs to 4 - 5 hrs), thus ensuring the normal life of the patient with the ability to work. This has offered new important and effective clinical treatment for the patient with refractory insomnia. As a generally accepted therapy in wide field of psychiatric treatment, MECT is relatively safe and has a rapid action. To our knowledge, this is the first report to describe MECT application in a patient with chronic insomnia.

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