

The use of Focused-Attention Meditation Combined with Muscle Relaxation (MR Therapy) in the treatment of Recurrent Isolated Sleep Paralysis (RISP) – two case reports

Paulina Wróbel-Knybel, Leszek Wołkowski, Hanna Karakuła-Juchnowicz

Abstract:

Recurrent isolated sleep paralysis (RISP) belongs to the parasomnias of the REM sleep. Currently, there are few treatment options for this disorder. Pharmacotherapy is reserved only for the most severe cases of RISP. The first-line treatment is cognitive-behavioural therapy, the availability of which is limited. A new treatment option is meditation-relaxation therapy (MR therapy), the effectiveness of which is supported by preliminary studies.

Method: This article describes two case reports of the use of a new treatment technique for RISP, MR therapy, over an 8-week period.

Results: In patient 1, there was a significant improvement in the form of a reduction in the number and severity of episodes of sleep paralysis, as well as worry and stress related to RISP. In patient 2, who was simultaneously diagnosed with an emotionally unstable personality and an eating disorder, there was no improvement in RISP, though a significant decrease in the severity of depressive symptoms, post-traumatic stress disorder and normalisation of cortisol levels were observed.

Conclusions: MR therapy appears to be a promising form of treatment. Both patients benefited from its use, although the effect may be limited if other psychiatric disorders coexist.

sleep paralysis; sleep disorder; MR therapy; anxiety

INTRODUCTION

Sleep paralysis (SP) is a type of dissociative state that occurs during falling asleep or awakening from sleep [1]. It consists of an inability to move

caused by skeletal muscle atonia, characteristic of the REM sleep stage but with the consciousness of the person experiencing it preserved. The oculomotor muscles and diaphragm retain their functions [2]. The experience is usually accompanied by anxiety, often fear of death [3]. Other symptoms of the condition include psychosomatic symptoms such as a feeling of palpitations, pressure on the chest, choking, sweating and hypnopompic and hypnagogic hallucinations [4,5]. Due to the specificity of the hallucinations occurring in SP, the following types are

Paulina Wróbel-Knybel¹, Leszek Wołkowski^{2,3}, Hanna Karakuła-Juchnowicz¹: ¹1st Department of Psychiatry, Psychotherapy and Early Intervention, Medical University of Lublin, Poland; ²Department of Cancer Genetics with Cytogenetics Laboratory, Medical University of Lublin, Poland; ³Department of Paediatric Haematology and Oncology and Transplantology – Medical University of Lublin, Poland
Correspondence address: paulina.wrobel-knybel@umlub.pl

distinguished: “intruder” – associated with increased fear and the sensation of a hostile presence near the sleeper; the “incubus” type involving tactile hallucinations such as pressure on the chest, difficulty breathing and pain [6]; the ‘unusual bodily experience’ type, i.e. feelings of floating/flying, out of body experiences (OBEs) [6].

Recurrent isolated sleep paralysis (RISP) is classified as a sleep disorder belonging to the parasomnia of REM sleep and its presence is often associated with a significant reduction in quality of life and anxiety about going to bed [1]. It is estimated that 7.9 per cent of the world’s general population, 28.3 per cent of students and 31.9 per cent of psychiatric patients have experienced at least one episode of SP in their lifetime. In Poland, in a sample of 2600 students surveyed, 33 % experienced one or more episodes of SP in their lifetime [7]. To date, the prevalence of SP in the general population of Poland has not been estimated, but there is data on the prevalence of this sleep phenomenon among representatives of professional groups exposed to intense stress: firefighters – 8.7%, nurses and midwives – 27.91%, police officers – 15.52%, teachers – 26.17% [8,9].

Research suggests that a higher prevalence of SP may be associated with anxiety disorders, including post-traumatic stress disorder (PTSD) [10]. SP is also one of the symptoms of narcolepsy [10].

Factors that may increase the risk of this sleep disorder include poor sleep hygiene, shift work, the presence of psychiatric disorders especially anxiety disorders, post-traumatic stress disorder, other sleep disorders (insufficient sleep syndrome, idiopathic hypersomnia, narcolepsy), certain stimulants (caffeine, nicotine), use of orexin antagonists (suvorexant, lemborexant, and daridorexant), somatic disorders (Wilson’s Disease, hypertension, obstructive sleep apnoea), stress [9,11,12].

Among the available treatments for recurrent isolated sleep paralysis are CBT methods, but their effectiveness has not yet been documented [13]. In particularly severe cases, pharmacotherapy with drugs from the group of selective serotonin reuptake inhibitors (SSRIs) and tricyclic antidepressants (TCAs) may have a beneficial therapeutic effect [13-16]. As in the case of other sleep disorders, it is important to treat co-

morbidities and improve sleep hygiene, including elements specifically dedicated to SP (e.g. the avoidance of sleep in a supine position) [17].

Meditation-Relaxation Therapy for Sleep Paralysis (Focused-Attention Meditation Combined with Muscle Relaxation; MR Therapy)

The creator of meditation-relaxation therapy (MR therapy) is Dr Baland Jalal of the Department of Psychology at Harvard University, who is recognised as a leading expert on sleep paralysis [18]. The researcher, assumes that episodes of sleep paralysis, like panic attacks, arise through a vicious cycle mechanism and has proposed the ‘Panic-Hallucination (PH) Model of Sleep Paralysis’, the assumptions of which were the basis for the development of MR therapy. According to his theory, SP symptoms such as laboured breathing, a feeling of thrashing or pressure on the chest are associated with accelerated and shallow breathing caused by the decrease in oxygen concentration and hypercapnia characteristic of the REM sleep stage. These sensations are exacerbated when the patient attempts to deepen breathing [6,18,19]. In addition, the sensations of throttling and pressure on the chest, combined with the feeling of body paralysis, heightened anxiety can be further reinforced by catastrophic interpretations of the experience (e.g. “the belief that I am dying”). Such an interpretation can activate the amygdala and the ‘fight or flight’ response and induce a panic attack-like reaction. When the person experiencing the episode tries to “fight” it, e.g. when trying to move in order to overcome the paralysis, the somatic symptoms (i.e. palpitations, a feeling of thrashing and pressure on the chest) and anxiety increase, as is the case in classic panic attacks [6,18,20]. Anticipatory anxiety is also characteristic of SP attacks, which is part of a positive feedback loop that worsens attacks and leads to more frequent awakenings during the night, predisposing to SP by making sleep shallow and REM sleep increased [18].

Meditation and Relaxation Therapy is based on the “Panic-Hallucination (PH) Model of Sleep Paralysis” and its aim is to act on its individual links to reduce the severity of symptoms [18]. It consists of four steps that the patient, after re-

ceiving psychoeducation on sleep paralysis episodes and sleep hygiene, and training in how to perform the therapy, applies alone during SP episodes and twice a week outside of episodes as part of exercise [18].

Step No. I – reassess the significance of the attack: the patient should reassess the significance of the SP episode by telling themselves that the experience is common, mild and temporary and that the hallucinations are a typical by-product of the REM sleep phase i.e. dreaming. The eyes should remain closed throughout the SP episode, it is important to remain calm and to avoid moving [18].

Step No. II – psychological and emotional distance: the patient should tell himself that since the experience is common, mild and temporary, there is no reason to fear or worry. Fear and worry (catastrophic interpretations of the attack) will only make the episode worse and probably prolong it, and are unnecessary emotions [18].

Step No. III: inward focusing meditation: the patient should focus his or her attention inward on an emotionally significant positive image (e.g. a memory of a loved one or event). He should keep his full attention on this imagery and engage it emotionally (i.e. reflect on all its positive aspects). Psychophysical symptoms and hallucinations should be ignored. If the patient becomes distracted, he or she should direct attention back to the positive imagery [18].

Step No. IV: Muscle relaxation: when engaging in inward-focused meditation, the patient should relax his muscles and avoid tensing them and controlling his breathing or trying to move. He or she should adopt a non-judgmental attitude of acceptance towards physical symptoms [18].

It is advisable to train the method regularly, even in the absence of SP, as good practice of the method allows for better results [18].

To date, the therapy has been applied in a pilot study in which the study group consisted of patients with narcolepsy, and one article has appeared describing the effects of the therapy in two patients suffering from recurrent sleep paralysis. The conclusions drawn from the experiences described in these papers seem promising [18,21].

In the aforementioned pilot study in a group of 6 patients with narcolepsy, after 6 weeks of MR

therapy, there was a 50% decrease in the number of days in which sleep paralysis occurred and a 54% reduction in the total number of episodes of sleep paralysis during the last month of treatment [21]. Improvements were not observed in the control group using the deep breathing method [21]. Although this study was preliminary, exploratory and involved a small group of participants, its results are very encouraging and bring hope for effective treatment of the disorder not only in narcolepsy patients but also in patients experiencing isolated sleep paralysis.

The cases described also reported a beneficial effect of meditation and relaxation therapy on SP. In the first of the described cases, in which sleep paralysis was associated with the presence of frightening hallucinations and increased medication associated with the episodes, the use of MR therapy resulted in the cessation of anxiety and significant re-education or complete cessation of the hallucinations. The second case involved a patient who was experiencing recurrent SP associated with anxiety symptoms and symptoms of post-traumatic stress disorder, the application of MR therapy, led to a reduction in the frequency of SP, alleviation of accompanying hallucinations and a reduction in the severity of anxiety and PTSD symptoms [18].

This article aims to present two case reports of the effects of a new RISP treatment technique Focused-Attention Meditation Combined with Muscle Relaxation (MR therapy) for 8 weeks.

Instructions for meditation-relaxation therapy (MR therapy) for the patient:

“Apply the meditation-relaxation technique (MR therapy) during all episodes of sleep paralysis (SP) over the next 8 weeks. The MR technique should be applied as follows:

At the beginning of the SP you should close your eyes and refrain from moving. Throughout the SP episode you should keep your eyes closed, remain calm, do not move and avoid panicking, even if you are frightened.

Step 1: reinterpret/assess the meaning of the attack: Initially, you should re-interpret the meaning of the SP episode, reminding yourself that the experience is common throughout

the world, mild (i.e. harmless) and temporary [i.e., paralysis usually occurs during rapid eye movement (REM) sleep due to some well-known brain mechanisms] and that hallucinations are a typical side effect of sleep (i.e., a remnant of sleep, “it’s like you’re dreaming with your eyes open”), it is not dangerous in any way.

Step II: psychological and emotional distance: next, you should tell yourself that since the experience is frequent, mild (that is, harmless) and temporary, there is no reason to be afraid or worried. In fact, fear and worry (catastrophic in their consequences) will only make the episode worse and probably prolong it and are completely unnecessary emotions.

Step III: inward focusing meditation: you focus all your attention inwards on an emotionally clear and meaningful positive object (e.g. you think intensely about certain ‘happy images’, e.g. a loved one, and try to visualise these thoughts as much as possible). You should focus all your attention on this inner object and engage it emotionally (i.e. intensely consider all its positive aspects). Corporeal symptoms, sensations and external stimuli (i.e. hallucinations) should be ignored at all times, and when you are distracted, immediately focus all your attention back on the inner object (i.e. positive thoughts and mental images).

Step IV: muscle relaxation: when implementing inward-focused meditation (i.e. Step III), you should relax your muscles and avoid flexing them; also avoid controlling your breathing, do not under any circumstances try to move [attempting to move or breathe heavily can cause pain, cramps in your limbs and a feeling of pressure on your chest, so this should be avoided]. You should adopt a non-judgmental attitude of acceptance towards all physical sensations; that is, you should realise that physical sensations are due to normal physiological mechanisms associated with REM sleep and are not dangerous in any way.”

Trial protocol (twice a week).

MR techniques should be practised during normal wakefulness twice a week for 15 minutes. You should lie on your back (i.e. in a supine position) and go through each of the steps above, while visualizing that you are actually going

through a SP episode (i.e. that you are currently paralysed, unable to move or speak).

Author’s consent to use Focused-Attention Meditation Combined with Muscle Relaxation; MR therapy.

The doctor instructing the patients on meditation-relaxation (MR) therapy was previously trained to do so by the author of the method, Dr Baland Jalal, and was given permission to use it. The therapy protocol, patient manual and sleep paralysis diary are tools designed by Dr Baland Jalal and were made available for the study. The materials were translated into Polish by two independent certified translators.

Approval for the use of MR therapy in patients was obtained from the Bioethics Committee at the Medical University of Lublin No. KE-0254/256/2019.

Case No. 1

Patient 31 years old, economically active, works as a psychiatrist and researcher, employed in shifts. She spends about 2 to 4 hours per week on physical exercise (BMI – 22.0). She is not chronically treated for anything and does not use any medication. The patient’s mother and grandmother had a family history of recurrent isolated sleep paralysis. She is not burdened by any addiction. She drinks one coffee per day. On average, she sleeps about 7 hours per day and does not nap during the day. She follows the rules of proper sleep hygiene, except on days when she is on night shifts (night duty at the hospital). She has suffered from sleep paralysis since the age of 12, and experiences an average of about 2 sleep paralysees per week. She has experienced 8 episodes of sleep paralysis in the last month before starting therapy, in the last year she estimates there have been about 75 episodes, and in her lifetime about 700. She estimates the average duration of a SP episode to be about 10 minutes. Her sleep paralysees occur more frequently and are more severe during stressful periods, situations of high fatigue and when she has to work at night (Table 1). The episodes are associated in her with increased stress and also fear of death. The episodes occur when she awakens from sleep, and she experiences hypnopompic hallucinations during them.

The patient describes the course of her typical sleep paralysis as follows:

"Suddenly I realise I can't move or breathe. I look around the room and feel that something is terribly wrong. Sometimes I had the feeling that someone or something was standing next to my bed or a sense of an 'evil presence', even though I knew logically that no one could be there. Or I would hear a crash or a noise, which was also frightening."
"I suddenly realise that I'm unable to move and can't breathe. I look around the room and feel that there is something terribly wrong. Sometimes I had the impression that someone or something was standing beside my bed or the feeling of some 'evil presence', although I logically knew that no one could be there. Or I heard a crack or noise that was frightening as well".

Characteristics of the patient's SP episodes and her knowledge and beliefs about this sleep disorder are included in Table 1.

Case No. 2

Patient 23 years old, single, childless, secondary education-actually after the first year of her third course of study. Outpatient psychiatric treatment for about 5 years. So far, hospitalized psychiatrically three times.

First time patient hospitalized psychiatrically from 11.02.2021-04.03.2021, with diagnosis F60.3 (Emotionally unstable personality disorder), F50.3 (Atypical bulimia nervosa.), F10.2 (Mental and behavioural disorders due to use of alcohol (dependence syndrome)), second hospitalisation in the period 17.05.2021-07.07.2021 with diagnoses F60.3 (Emotionally unstable personality disorder), F19.1 (Mental and behavioural disorders due to multiple drug use and use of other psychoactive substances: harmful use), F50.3 (Atypical bulimia nervosa).

While undertaking MR therapy, she was hospitalised in the Treatment Unit for Neurotic and Personality Disorders. The reason for the stay was deterioration of the mental state in the form of labile mood, irritability, increasing in-

ternal tension, alternating periods of starvation and compulsive overeating with provocation of vomiting.

The patient is chronically ill with hypothyroidism and hypertension, and takes levothyroxine, lamotrigine (200mg/day), quetiapine (200 mg/day), carbamazepine (600 mg/day), bisoprolol (1.25 mg/day), vitamin D 2000 IM, Heparegen on a regular basis.

The patient has been smoking cigarettes for about 5 years, currently 20 cigarettes per day. She consumes alcohol more than twice a week, among the alcohols she reaches for are beer, wine, vodka and whisky. She drinks one coffee a day; she does not consume other beverages with caffeine. Does not participate in sports.

During the night she sleeps about 8 to 10 hours, during the day he takes naps that last approx. 3 hours. She negatively assesses the quality of her sleep. The patient has been experiencing recurrent sleep paralyses for about 3-4 years. Episodes of sleep paralysis occur several times a month. Occasionally they occur daily, usually periods in her life when the patient has experienced particularly stressful situations. She reported that the sleep paralyses "got used to", but they significantly impair her nightly rest and are associated with increased stress.

She has experienced 18 episodes of sleep paralysis in the last month before starting therapy, in the last year she estimates there have been about 80, and in her lifetime about 300. She estimates the average duration of a SP episode to be about 2 minutes.

The patient describes her typical course of sleep paralysis as follows:

"I am woken up by a sudden sound or external stimulus such as an alarm clock, but my body remains asleep, I am unable to move anything, I have no control over it. I often hear a screeching sound and feel a huge tense in my cervical region. I also have the sensation of falling into nothingness. A sense of immense derealisation, heaviness, paralysis of the body, freezing prevails. I often feel tingling and numbness. It reminds me of panic attacks. Palpitations also occur."

She further reported that:

“Often, in addition to the feeling of paralysis of the body, I hear the voices of different people”.

Characteristics of the patient’s SP episodes and her knowledge and beliefs about this sleep disorder are included in Table 1.

During her stay in the unit, in addition to MR therapy, she participated in individual therapy,

group therapy and various forms of occupational therapy.

The patient’s laboratory tests (morphology, biochemistry and immunochemistry) were within normal limits, except for morning cortisol levels, which were elevated prior to the start of MR therapy (235 ng/ml; normal 62-194 ng/ml).

Table 1. Characteristics of sleep paralysis episodes based on information collected from female patients using the Sleep Paralysis Experience and Phenomenology Questionnaire

	Patient No. 1		Patient No. 2	
	Before MR-therapy	After 8 weeks of MR therapy	Before MR-therapy	After 8 weeks of MR therapy
Duration of episodes (min)	10 min	2 min	2 min	Max. 2 min
Time of occurrence	When waking up		When waking up	
Position incidence	On the back		Position does not matter	
What triggers episodes	Stress, irregular sleep, life changing shifts, perhaps skipping meals. It occurs more frequently when working at night.		Usually occurs during periods of tension and strong emotions	Mostly the events of the past day and working on blocked feelings, often anger.
What is the cause of the disorder?	I think it may be genetic – my mum had the same thing. i think some chemical imbalance in the brain or some functional cause is causing this condition. I am a psychiatrist and I think the vulnerability-stress disorder model has some merit ;) I have noticed that episodes are more frequent during stressful periods.		This is definitely influenced by the experiences of the day and the memories that live in me on an ongoing basis through therapy.	
SP psychosomatic symptoms:				
Pressure on the clp	+	+	-	-
Difficulty breathing	+	+	+	+
Pain or discomfort in the lumbar region	+	+	+	+
Throttling sensation	+	+	-	-
Nausea or abdominal pain	-	-	-	-
Dizziness/feeling of fainting	-	+	+	+
Sweating	+	-	+	+
Body trembling	-	-	+	+
Rapid heartbeat	+	+	+	+
Chills or hot flashes	+	-	+	+
Body numbness/tingling	+	+	+	+

Sensation of body spinning	-	-	+	+
Do you experience anxiety during episodes?	Rather yes	Yes	Yes	
Fear of death	sometimes	sometimes	Rather not	Not
Why do you think you experience anxiety during SP episodes?	It's like existential anxiety – the nervous system is completely in a state of fight/flight or dissociative fear that cannot be easily verbalised or rationalised.		In the beginning, I experienced severe anxiety because I didn't know what was happening to me	The anxiety is mainly about the sheer content appearing in my head and the inability to move and the lack of control over my body.
Why are you afraid of dying?	Shortness of breath, inability to breathe deeply Because of the pressure on my chest – I feel like I'm suffocating.		-	
Feelings of derealisation/ depersonalisation	Depersonalisation		Derealisation and depersonalisation	
Emotions other than fear	Not	Not	Extreme anxiety, confusion, dullness, helplessness	Anxiety, fear due to lack of sense of control, powerlessness, loneliness
Have you seen anything like a shadow, shape or being approaching you?	Yes, black figures standing by my bed covering my mouth and nose with a blanket so I can't breathe. bookcases that don't belong in my room. dark stains on the walls. shadows.	Yes, a shadowy dark figure standing next to me	Yes, it was a rather indeterminate shape, very indistinct, moving above me	Yes, they were often the shadows of people who had influenced my life in some way, or those I had dreamt about. Sometimes, even though my eyes were open I would see absolute darkness.
Did something sit on your chest	Yes, it wanted to strangle me. To kill me slowly and painfully (although all the time I knew it was just a hallucination – but the fear was very real)	Not	Not	Yes-but not always. Sometimes it just stood over me or appeared as a shadow on the wall. I felt threat when I felt the touch of it on my body – sitting on my chest, holding my hands, my legs.
Have you felt the presence of a hostile presence near your bed?	Yes, it seems to me that this presence could have very bad intentions – to hurt me or kill me.	Yes	Yes, it was the presence of this above undefined shadow, however, I felt that something was in the air	Yes, but most of the time I felt a ball of thickened air moving over me. It was as if I was looking at something fuzzy but invisible.

Did you hear sounds such as voices or footsteps during the episodes?	Yes	Yes – creaking sounds	Yes, it's usually a screech, something like the sound of a squeaking kettle or a sound like someone running their fingernails across the glass	Yes, wheezing, as if from a kettle, often voices saying my name and as if calling me back. Sometimes I could hear my rambling thoughts that I just happened to have in my head.
Have you smelled unusual odours?	Not		Several times in my life the smell of burning	
Have you experienced momentary abandonment of your body?	Yes	Yes	Yes, it has to do with dissociation and derealisation. Several times I have seen my body from the side as if I had left it	
Have you experienced looking at your own body from the outside?	Yes	Yes	I could see from the side myself lying on the bed, and I was standing next to it.	
What did you do to prevent episodes ?	Sleeping medication, yoga	I try to avoid sleeping on my back, and now practice MR – therapy	I have been referred to a sleep disorder counselling service, but according to my psychiatrist it is caused by tension.	I used MR-therapy, breathing and calming exercises 3-4 times a week. It was also helpful to complete this questionnaire, as it enabled me to make a more conscious connection between SP episodes and their possible triggering.
Have you previously contacted your doctor?	Not	Yes, MR therapy	Not	Yes, MR therapy
To the best of your knowledge, has anyone in your community or family talked about this kind of experience?	My mother said that we may have a certain genetic susceptibility and will have to live with SP episodes are common in our family – and sooner or later they will go away		Not	Not
Have you ever heard of the name of this experience?	„nachtmahr” or „nachtalb” is the German word for the type of demon believed to have caused the disease in ancient times.		Sleep paralysis	
From whom or where have you heard this name before?	From grandma		When I experienced several episodes of sleep paralysis I started to take an interest and read various articles related to it.	

Procedure for application and course of Meditation-Relaxation therapy

Both patients received psychoeducation on sleep hygiene and a detailed one on sleep paralysis. Each step of the meditation and relaxation therapy was discussed in detail, after which each patient practised the application of the entire therapy in the presence of the training doctor.

Meditation-relaxation therapy (MR therapy) instructions were given to the patients. In addition to episodes, the method was recommended to be used twice a week for 15 minutes to improve the effectiveness of the intervention.

Patients were asked to complete six questionnaires prior to and at the end of therapy:

- 1) Sleep Paralysis Experience and Phenomenology Questionnaire (assessing the severity and course of sleep paralysis)
- 2) Beck Depression Inventory-2 (BDI-2) to assess severity of depressive symptoms
- 3) PTSD checklist for DSM-5 (PCL-5)
- 4) The Propensity to Worry Questionnaire (PSWQ)
- 5) State-Trait Anxiety Inventory (STAI)
- 6) Perceived Stress Scale (PSS-10)

They were also given a sleep paralysis diary in which they assessed daily (Table 2):

1. Number of sleep paralysees
2. Duration of sleep paralysis
3. Level of anxiety, fear and worry associated with episodes of sleep paralysis – they marked the severity of these symptoms on a 10-point Likert scale.

Summary of the effects of MR therapy

Patient No. 1

The patient noted both a reduction in the number and severity of sleep paralysees.

Based on the sleep paralysis diary, a reduction in the frequency of SP was reported: in the first month of therapy 5 SP episodes, in the second 2 episodes (in the month before therapy the patient reported 8 SP episodes) (Table 2). The duration of SP episodes decreased from 10 minutes from before therapy to 2 minutes during therapy

(Table 2). In addition, the severity of symptoms on the trait anxiety rating scale (STAI-X2) and the severity of perceived stress (PSS-10) decreased. Anxiety and worry associated with SP episodes decreased slightly (table 3).

She is satisfied with the results of the therapy and intends to continue it.

Patient No. 2

There was no reduction in the number or severity of SP episodes in the patient. The levels of anxiety, stress and worry associated with the episodes also did not decrease (Table 3). There was a reduction in the severity of depressive symptoms on the BDI-2 questionnaire and post-traumatic stress symptoms on the PCL-5 scale (table 3). The morning cortisol level of 235 ng/ml, which was elevated before the start of therapy, decreased to 202.1 ng/ml after the first two weeks of therapy and was 179.4 ng/ml at the end of therapy (norm: 62-194 ng/ml).

How the patient assesses the effects of the therapy:

“ what has changed is that most of the paralysis is about falling into the void. There is less anxiety in me during sleep paralysees. However, I still hear voices very clearly, but this time of people who have actually had an impact on my life. I feel their overwhelming presence.”

For most of her stay in the ward, she reported psychomotor anxiety and frequent panic attacks. During one anxiety attack, she sustained an injury resulting in a multifracture fracture of her mandible – treated conservatively with good results. She had frequent episodes of overeating and provoking vomiting, periods of starvation and constipation. Her BMI decreased from 22.8 to 20.5.

Gradually, under the influence of therapeutic measures, the patient's psychological state partly improved in the form of mood stabilisation, psychomotor drive levelling out, the number and intensity of panic attacks decreased, periods of alternate overeating, starvation and vomiting were less frequent, and body weight stabilised.

Table 2. Number and duration of episodes of sleep paralysis and severity of psychological symptoms assessed using a Likert scale over consecutive weeks of MR therapy in patient 1 and patient 2.

		Therapy week								
		1	2	3	4	5	6	7	8	
Number of SP episodes per week		Patient No. 1	1	1	1	2	1	0	1	0
		Patient No. 2	5	4	7	3	5	0	1	5
Average duration of SP episodes (s)		Patient No. 1	300	180	180	120	420	0	120	0
		Patient No. 2	72	60	60	60	84	0	60	60
Average Severity of psychological symptoms associated with SP episodes	Stress (1-10)	Patient No. 1	7	7	5	7	7	0	6	0
		Patient No. 2	7	8.71	10	7.85	8.14	9	7.43	7.14
	Anxiety (1-10)	Patient No. 1	8	7	7	8	7	0	7	0
		Patient No. 2	6.29	7.85	9.71	7.42	7.85	8.86	7.43	7.43
	Worrying (1-10)	Patient No. 1	8	6	5	7.5	6	0	5	0
		Patient No. 2	7.71	7.57	9.85	7	7.85	8.43	7.51	7.29
s – seconds										

Table 3. Severity of psychological symptoms measured by psychological questionnaires before and after MR therapy

		Number of points in diagnostic questionnaires					
		BD-2	PCL-5	PSWQ	STAI-X1	STAI-X2	PSS-10
Before starting MR therapy	Patient No. 1	3	10	29	27	28	10
	Patient No. 2	59	72	64	66	59	31
After 8 weeks of treatment	Patient No. 1	4	10	33	27	24↓	5↓
	Patient No. 2	50↓	70↓	64	66	59	34
BD-2 – Beck Depression Scale 2; PCL-5 – PTSD Checklist for DSM-V; PSWQ – Prone to Worry Assessment Questionnaire, STAI X1 and X2 – State and Trait Anxiety Inventory (STAI); PSS-10 – Perceived Stress Scale, ↓ decrease in symptom severity							

DISCUSSION

In this article, we present two case reports on the use of meditation-relaxation therapy as a treatment for sleep paralysis. In the first case, we observed beneficial therapeutic effects in the form of a reduction in the number and duration of sleep paralysis episodes. In addition, the severity of symptoms on the trait anxiety rating scale and perceived stress decreased. Anxiety and worry associated with SP episodes were also reduced. The patient was satisfied with the effects of the method and intended to continue it. The therapy was time-limited, lasting only 8 weeks; we presume that a longer duration would be associated with greater improvement. In contrast, the results are different in the second patient, where we observed no therapeutic response in terms of relief of sleep paraly-

sis. We see the reasons for this in the patient’s high comorbidity – eating disorders and borderline personality disorder. Patients with emotionally unstable personalities are characterised by increased activity of the sympathetic nervous system with decreased parasympathetic activity, and disorders of the hypothalamic-pituitary-adrenal axis in the form of increased cortisol levels and a stronger reaction to stress, which we suspect may have impeded the patient’s meditative and relaxation states, which are elements of the therapy, and thus disrupted its course [20-22]. In addition, during the course of MR therapy, the patient simultaneously participated in individual and group therapy within the 24-hour Neurosis and Eating Disorders Treatment Unit, which involved a very intense therapeutic process and effort on the part of the patient, strong emotions and a periodic deteriora-

tion of her mental state. We believe that this fact may have affected the effects of the meditation-relaxation therapy. It could be beneficial to prolong the patient's therapy in the ward or to repeat it once her mental state has stabilised and she has completed her treatment in the 24-hour therapeutic ward. It is also possible that the use of meditation-relaxation therapy is associated with better therapeutic effects in those patients in whom SP is an isolated disorder. Particularly disorders in an unstable phase, which disorganise the patient's life, should be treated first and meditation-relaxation therapy as an adjunctive treatment, or should be postponed until partial stabilisation of the mental state. On the other hand, in our patient, after undertaking MR therapy, we observed a decrease in morning cortisol levels, which were elevated before therapy, and eventually normalised. Which may indicate a benefit of the therapy, by reducing the stress levels associated with the episodes, despite still no subjective improvement on the part of the patient. It is worth noting that in a case report in the literature of a patient suffering from recurrent SP and additionally experiencing anxiety symptoms and symptoms of post-traumatic stress disorder, the use of MR therapy was associated with a beneficial effect [18], so not every psychiatric disorder coexisting with recurrent sleep paralysis may interfere with the use of MR therapy. Post-traumatic stress disorder and anxiety disorders are the most common health problems co-occurring with SP, so this case report carries the hope of effective therapy for patients in these groups. It is noteworthy that in both the cases we described and other work on the effects of MR therapy, no side effects were reported [18,21].

Another factor that may have affected the effects of MR therapy was patient 2's lack of adherence to proper sleep hygiene (prolonged bedtime, daytime naps-which may have contributed to shallower sleep) [25]. Patient 1 followed the principles of proper sleep hygiene, disregarding the intermittent disruption of diurnal rhythms in the form of night duty.

Few treatments for sleep paralysis (SP) are currently available, either pharmacological or psychotherapeutic, and their effectiveness is not fully proven. Cognitive-behavioural therapy (CBT) techniques are used worldwide, among them an

approach called Culturally Adapted CBT (CA-CBT), which focuses on psychoeducation and modifying catastrophic beliefs about SP episodes [26,27]. Another approach is Cognitive behavioural therapy of sleep paralysis (CBT-ISP), which emphasises interactions beyond SP episodes through psychoeducation, sleep diary skills training, reduction of daytime tension and stress through the use of relaxation methods, and cognitive reinterpretation and reassessment of SP episodes. In the area of coping during SP episodes, the method protocol is limited to guidance on interrupting the attack through the diaphragmatic breathing method, and attempting to move, e.g. with a toe [13,28,29]. MR therapy is also based on standard CBT theory and the paroxysmal anxiety model, but contains some distinctive differences. Firstly, it discourages movement during SP episodes because, due to the deafferentation phenomenon occurring during the REM stage, sensory feedback from the body is lacking, which can lead to pain and limb spasms. It also does not include elements such as controlling breathing (e.g. using deep breathing techniques), because during the REM stage it is natural to shallow breathing and attempts to deepen breathing may be associated with a feeling of suffocation, pressure or chest pain; and focusing on somatic symptoms, because this in turn may exacerbate anxiety as in panic attacks [18,30].

In addition, the author of the therapy himself, Dr Baland Jalal, points to the many advantages of the therapy that distinguish it from other available treatments [18]. Each of the steps of the therapy, is based on scientific research and is associated with potential therapeutic benefits for the patient. The first and second steps of therapy, i.e. reassessing the meaning of the episode and cognitive distancing, are among the strategies for emotion regulation and, as research indicates, make it possible to calm the over-activation of the amygdala and thus reduce the level of anxiety associated with SP episodes [18,31]. The next step, i.e. inward-focused meditation, may prevent the preoccupation with the attack, facilitate entry into a relaxed-meditative state, which physiologically may lead to parasympathetic dominance and thus facilitate falling asleep. Inward-focused meditation has been shown to be associated with particularly beneficial effects on

sleep and lower levels of anxiety, positive affect and higher levels of alpha brain wave activity [32]. The last step of the therapy, i.e. muscle relaxation, allows a reduction in somatic symptoms during SP and also prevents OBE (out of body experience) hallucinations, which occur due to body image disturbances associated with a lack of limbic feedback [18,20].

We believe that one of the main advantages of MR therapy is that it can provide a complete and systematic step-by-step method of dealing with SP directly during an attack [18]. The patient can apply the technique himself at home and does not need to undertake systematic behavioural-cognitive therapy, the availability of which is very limited and its cost often very high. Scientific reports to date on the effects of this method are very promising and bring hope for patients and therapists. A prospective study to identify good response factors to MR therapy would be warranted.

REFERENCES

- American Academy of Sleep Medicine. ICSD-3 Online Version – American Academy of Sleep Medicine (AASM). AASM 2014.
- Yamada RG, Ueda HR. Molecular Mechanisms of REM Sleep. *Front Neurosci.* 2020;13:1402.
- Sharpless BA, McCarthy KS, Chambless DL, Milrod BL, Khalsa SR, Barber JP. Isolated sleep paralysis and fearful isolated sleep paralysis in outpatients with panic attacks. *J Clin Psychol.* 2010; 66(12): 1292-1306.
- Jalal B, Romanelli A, Hinton DE. Sleep paralysis in Italy: Frequency, hallucinatory experiences, and other features. *Transcult Psychiatry.* 2020; 58(3): 427-439.
- Wróbel-Knybel P, Karakula-Juchnowicz H, Flis M, Rog J, Hinton DE, Boguta P, et al. Prevalence and clinical picture of sleep paralysis in a Polish student sample. *Int J Environ Res Public Health.* 2020; 17(10): 3529.
- Cheyne JA, Rueffer SD, Newby-Clark IR. Hypnagogic and Hypnopompic Hallucinations during Sleep Paralysis: Neurological and Cultural Construction of the Night-Mare. *Conscious Cogn.* 1999; 8(3): 19-337.
- Wróbel-Knybel P, Flis M, Rog J, Jalal B, Karakula-Juchnowicz H. Risk factors of sleep paralysis in a population of Polish students. *BMC Psychiatry.* 2022;22:1-13.
- Wróbel-Knybel P, Rog J, Jalal B, Szewczyk P, Karakula-Juchnowicz H. Sleep paralysis among professional firefighters and a possible association with PTSD-Online survey-based study. *Int J Environ Res Public Health.* 2021;18(18): 9442.
- Wróbel-Knybel P, Flis M, Rog J, Jalal B, Wolkowski L, Karakula-Juchnowicz H. Characteristics of Sleep Paralysis and Its Association with Anxiety Symptoms, Perceived Stress, PTSD, and Other Variables Related to Lifestyle in Selected High Stress Exposed Professions. *Int J Environ Res Public Health.* 2022; 19(13): 7821.
- Sharpless BA, Barber JP. Lifetime prevalence rates of sleep paralysis: A systematic review. *Sleep Med Rev.* 2011; 15(5): 311-315.
- Denis D, French CC, Gregory AM. A systematic review of variables associated with sleep paralysis. *Sleep Med Rev.* 2018; (38):141-57.
- Na HJ, Jeon N, Staatz CE, Han N, Baek IH. Clinical safety and narcolepsy-like symptoms of dual orexin receptor antagonists in patients with insomnia: a systematic review and meta-analysis. *Sleep* 2024; 47(2), zsad293.
- Sharpless BA, Doghramji K. Commentary: how to make the ghosts in my bedroom disappear? Focused-attention meditation combined with muscle relaxation (MR therapy)-A direct treatment intervention for sleep paralysis. *Front Psychol.* 2017;8.
- Hishikawa Y, Ida H, Nakai K, Kaneko Z. Treatment of narcolepsy with imipramine (Tofranil) and desmethylinipramine (Pertofran). *J Neurol Sci.* 1966;3.
- Koran LM, Raghavan S. Fluoxetine for Isolated Sleep Paralysis. *Psychosomatics.* 1993;34.
- Hintze JP, Gault D. Escitalopram for recurrent isolated sleep paralysis. *J Sleep Res.* 2020; 29(6): e13027.
- Sharpless BA. A clinician's guide to recurrent isolated sleep paralysis. *Neuropsychiatr Dis Treat* 2016;12:1761-7.
- Jalal B. How to make the ghosts in my bedroom disappear? Focused-attention meditation combined with muscle relaxation (MR therapy)-a direct treatment intervention for Sleep Paralysis. *Front Psychol.* 2016; 7:28.
- Hishikawa Y, Shimizu T. Physiology of REM sleep, cataplexy, and sleep paralysis. *Adv Neurol.* 1995; 67: 245-271.
- Jalal B, Ramachandran VS. Sleep paralysis and "the bedroom intruder": The role of the right superior parietal, phantom pain and body image projection. *Med Hypotheses.* 2014; 83(6): 755-757.
- Jalal B, Moruzzi L, Zangrandi A, Filardi M, Franceschini C, Pizza F, et al. Meditation-Relaxation (MR Therapy) for Sleep Paralysis: A Pilot Study in Patients With Narcolepsy. *Front Neurol.* 2020;11.
- Flasbeck V, Popkirov S, Ebert A, Brüne M. Altered interoception in patients with borderline personality disorder: a study using heartbeat-evoked potentials. *Borderline Personal Disord Emot Dysregulation.* 2020;7:1-13.
- Weinberg A, Klonsky ED, Hajcak G. Autonomic impairment in Borderline Personality Disorder: A laboratory investigation. *Brain Cogn.* 2009; 71(3): 279-286.
- Rausch J, Gäbel A, Nagy K, Kleindienst N, Herpertz SC, Bertsch K. Increased testosterone levels and cortisol avoid-

- ance responses in patients with borderline personality disorder: Gender and trait aggressiveness matter. *Psychoneuroendocrinology*. 2015;55: 116-127.
28. Baranwal N, Yu PK, Siegel NS. Sleep physiology, pathophysiology, and sleep hygiene. *Prog Cardiovasc Dis*. 2023;77.
29. Hinton DE, Pich V, Chhean D, Pollack MH. 'The Ghost Pushes You Down': Sleep Paralysis-Type Panic Attacks in a Khmer Refugee Population. *Transcult Psychiatry*. 2005; 42(1): 46-77.
30. Hinton DE, Pich V, Chhean D, Pollack MH, McNally RJ. Sleep paralysis among Cambodian refugees: Association with PTSD diagnosis and severity. *Depression Anxiety*. 2005; 22(2): 47-51.
31. Rauf B, Sharpless BA, Denis D, Perach R, Madrid-Valero JJ, French CC, et al. Isolated sleep paralysis: Clinical features, perception of aetiology, prevention and disruption strategies in a large international sample. *Sleep Med*. 2023; 104:105-112.
32. Melehin AI. Cognitive-Behavioral Therapy in the Treatment of Recurrent Isolated Sleep Paralysis. *Arch Neurol Neurosci*. 2021;11.
33. Jalal B. Response: Commentary: How to make the ghosts in my bedroom disappear? Focused-attention meditation combined with Muscle Relaxation (MR therapy)-A direct treatment intervention for sleep paralysis. *Front Psychol*. 2017;8:760.
34. Beauregard M, Lévesque J, Bourgouin P. Neural correlates of conscious self-regulation of emotion. *J Neurosci*. 2001; 21(18): RC165.
35. Nagendra RP, Maruthai N, Kutty BM. Meditation and its regulatory role on sleep. *Front Neurol*. 2012; 3:54.