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CASE REPORT

Sleepless Yet Asleep: A Case Report on Paradoxical Insomnia

Arthi K.K.,^{1,*} M. Sasidharan² and S.R. Nirmal³

¹*Final Year Post Graduate, Department of Psychiatry, Dhanalakshmi Srinivasan Medical College & Hospital, Perambalur Tamilnadu*

²*Second Year Post Graduate, Department of Psychiatry, Dhanalakshmi Srinivasan Medical College & Hospital, Perambalur Tamilnadu*

³*Professor, Department of Psychiatry, Dhanalakshmi Srinivasan Medical College & Hospital, Perambalur Tamilnadu*

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Abstract

Background: Paradoxical insomnia, also termed sleep state misperception, is a subtype of chronic insomnia in which a patient's subjective report of severely disturbed or absent sleep is markedly discordant with objective evidence of normal sleep duration and architecture on polysomnography. Patients typically overestimate sleep-onset latency and underestimate total sleep time, often without the daytime impairment expected of comparable objective sleep loss.

Case Report: We report the case of a 51-year-old married woman with a 15-month history of perceived total sleep loss, constant wakefulness, and early morning awakening, without objective daytime sleepiness. Serial Pittsburgh Sleep Quality Index (PSQI) scores remained abnormal despite sequential trials of dothiepin, mirtazapine, clonazepam, quetiapine, zolpidem, and melatonin. Sleep diaries maintained during inpatient evaluation documented adequate sleep, and nocturnal polysomnography and the Hamilton Depression Rating Scale (HDRS) were within normal limits, confirming a diagnosis of paradoxical insomnia.

Intervention and Outcome: The patient was managed with psychoeducation and cognitive behavioural therapy (CBT) targeting misperception of sleep, incorporating sleep diaries and sleep hygiene techniques, with sustained clinical improvement. **Conclusion:** This case emphasizes the need for objective sleep assessment in patients with treatment-refractory insomnia and shows that CBT is an effective, medication-sparing strategy for paradoxical insomnia.

Keywords: Paradoxical insomnia, sleep state misperception, polysomnography, cognitive behavioural therapy, Pittsburgh Sleep Quality Index

*Corresponding Author: Arthi K.K.

Email: dr.arthy16@gmail.com

Introduction

Insomnia is among the most common presenting complaints in psychiatric and primary care practice, but not all patients who report an inability to sleep have demonstrable sleep pathology on objective testing. Current diagnostic classifications, including the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR), and the International Classification of Sleep Disorders, Third Edition (ICSD-3), define chronic insomnia disorder primarily on the basis of subjective dissatisfaction with sleep quantity or quality rather than any single objective physiological threshold [1,2].

Paradoxical insomnia represents a distinct dissociation between a patient's perception of sleep and its physiological correlates: the individual believes they are awake, or sleeping poorly, while electrophysiological recordings show a pattern consistent with normal, restorative sleep. The construct was first described under the label "sleep state misperception" and remains a recognised, if underdiagnosed, insomnia subtype in contemporary sleep nosology, historically debated as to whether it represents a distinct clinical entity or a variant of psychophysiological insomnia [3]. Proposed neurophysiological correlates include subtle alterations in cortical arousal and sleep microstructure that are not captured by conventional polysomnographic staging [4], and the magnitude of subjective-objective sleep discrepancy in this subtype exceeds that typically observed in other insomnia disorders [5].

Diagnosing paradoxical insomnia is clinically important because these patients frequently undergo repeated, escalating,

and often ineffective pharmacological trials before the disorder is correctly identified, exposing them to unnecessary medication burden and side effects. We present a case in which correct recognition of paradoxical insomnia, following extensive and unsuccessful pharmacotherapy, allowed a shift to a targeted psychotherapeutic approach with good outcome.

Case Report

Patient Demographics and Clinical Details

A 51 year old married housewife currently living with her husband and grandchildren, presented with a 15 month history of perceived inability to fall asleep, a sense of being constantly awake and early morning awakening. She reported no daytime sleepiness and described sleep difficulty despite having adequate opportunity for sleep. At her index visit to our outpatient department in December 2023. she gave a 3 month history of these symptoms and was evaluated for insomnia.

Clinical Course

The Pittsburgh Sleep Quality Index (PSQI) score at this visit corresponded to more than 5 hours of subjectively perceived wakefulness at night. She was started on dothiepin, followed later by mirtazapine, with doses titrated to 100 mg and 30 mg respectively. Her symptoms persisted despite these adequate therapeutic doses, and the medications were discontinued after 3 months owing to poor response.

Diagnostic Assessment

Because her symptoms persisted, she underwent a master health check-up, following which clonazepam 0.5 mg was added. Repeat PSQI assessment again corresponded to more than 5 hours of

perceived nocturnal wakefulness even after initiation of the benzodiazepine. She showed only transient improvement lasting about a week before symptoms recurred. She was subsequently admitted for further evaluation and was started on a combination of quetiapine, zolpidem, and melatonin, and was asked to maintain a structured sleep diary. Diary-based monitoring during admission documented objectively adequate sleep, yet she continued to report subjective sleeplessness.

Therapeutic Intervention

She was psycho-educated about the nature of her illness and about the discordance between her perception of sleep and her actual sleep pattern, and was subsequently managed with cognitive behavioural therapy (CBT). On reassessment, PSQI continued to indicate more than 5 hours of perceived nocturnal wakefulness with two reported nighttime awakenings, although the patient's sleep was, on objective review, restorative. Other rating scales, including the Hamilton Depression Rating Scale (HDRS), were within normal limits. Overnight polysomnography demonstrated normal sleep architecture, with a total sleep time of approximately 410 minutes, sleep efficiency of 89%, sleep-onset latency of 18 minutes, rapid eye movement (REM) latency of 92 minutes, wake after sleep onset (WASO) of 24 minutes, and a normal distribution of sleep stages (N1: 6%, N2: 50%, N3: 22%, REM: 22%). No clinically significant respiratory events, periodic limb movements, or other sleep-related abnormalities were identified. These findings were within normal adult reference ranges. This combination of normal objective sleep parameters with persistent

subjective sleep complaints, unresponsive to sequential pharmacotherapy, was consistent with a diagnosis of paradoxical insomnia.

Follow-up and Outcome

The patient was managed with a multimodal, non-pharmacological strategy comprising sleep diaries, sleep hygiene education, and CBT directed at her misperception about sleep, and followed up for a period of 6 months. She remained clinically well on this regimen, and her subjective perception of sleep improved progressively over the course of psychotherapy sessions with improved PSQI score from baseline.

Discussion

Paradoxical insomnia occupies an unusual position among insomnia subtypes: patients experience genuine, often severe, distress about their sleep, while standard objective measures show sleep that is largely preserved in duration and architecture, as described in standard psychiatric reference texts [6]. Physiological and polysomnographic evaluation plays a central role in distinguishing this subtype from other insomnia presentations and in identifying medical or psychiatric comorbidities that might otherwise be overlooked [7].

The direction of misperception is also clinically relevant. Insomnia patients with "negative" sleep state misperception, that is, those who underestimate their sleep relative to objective recordings, as in the present case, tend to report higher Pittsburgh Sleep Quality Index (PSQI) scores, longer perceived sleep-onset latency, and more frequent awakenings than those with "positive" misperception, a pattern that correlates with reduced slow-

wave (N3) sleep on polysomnography [8]. The PSQI, used serially in this patient to track her subjective sleep complaints, is a validated instrument originally developed for psychiatric practice and research [9], while her mood status was concurrently screened using the Hamilton Depression Rating Scale (HDRS), a long-established, widely used clinician-administered instrument [10]. Structured sleep diaries, as used during this patient's inpatient evaluation, provide a practical adjunct to objective monitoring, and diary-based sleep estimates have been shown to correlate reasonably well with wearable and research-grade actigraphic measures in patients with insomnia disorder [11].

Management of paradoxical insomnia diverges from that of typical insomnia in that pharmacotherapy directed at increasing sleep duration is unlikely to be effective, since objective sleep duration is often already adequate. In the present case, the patient underwent sequential trials of dothiepin and mirtazapine; the latter is known to alter sleep architecture and increase slow-wave sleep in depressed patients, although its effect on primary sleep misperception specifically is not established [12]. Subsequent addition of an atypical antipsychotic (quetiapine) was similarly unlikely to have produced durable benefit, as systematic review evidence does not support a significant advantage of atypical antipsychotics over placebo for primary insomnia [13]. Likewise, non-benzodiazepine hypnotics such as zolpidem produce only modest reductions in objective and subjective sleep latency compared with placebo [14], and short-term melatonin has not been shown to be consistently effective for primary sleep disorders other than circadian phase disorders [15]. Current evidence-based

guidelines reflect this limited pharmacological evidence base, generally offering only weak recommendations in favour of individual hypnotic agents for chronic insomnia [16].

Cognitive behavioural therapy for insomnia (CBT-I) is recommended as first-line treatment for chronic insomnia disorder of any subtype, and polysomnography is specifically indicated when substantial sleep state misperception is suspected, as illustrated in the present case [17]. CBT-I has demonstrated durable effectiveness even when delivered in routine general-practice settings rather than specialised sleep clinics [18], and comparative data indicate that CBT-based interventions produce broader improvements in daytime and psychological functioning than medication-only strategies [19]. Long-term follow-up data further show that the benefits of CBT-I, including in cases with a strong misperception component, persist for years after treatment completion, distinguishing it from the largely short-term benefit profile of pharmacotherapy [20].

In the present case, the patient underwent multiple sequential trials of tricyclic antidepressants, mirtazapine, a benzodiazepine, and finally a combination of an atypical antipsychotic, a non-benzodiazepine hypnotic, and melatonin, none of which produced sustained symptomatic benefit. It was only after structured sleep-diary documentation of objectively adequate sleep, a normal HDRS, and normal polysomnography that the diagnosis of paradoxical insomnia was established, allowing a shift away from pharmacotherapy toward psychoeducation and CBT targeting her misperception of sleep. This sequence illustrates a common and avoidable pattern in clinical practice, in

which repeated medication trials precede rather than follow objective sleep assessment.

If left unrecognised and untreated, patients with paradoxical insomnia may become increasingly distressed and anxious about their perceived sleeplessness, and this heightened concern can, over time, contribute to genuine, objectively measurable sleep disturbance. This case therefore reinforces the importance of maintaining clinical suspicion for paradoxical insomnia in patients whose insomnia is refractory to escalating pharmacological trials, and of using sleep diaries, standardised rating scales, and polysomnography to confirm the diagnosis before committing to further medication changes.

Conclusion

Paradoxical insomnia should be considered in any patient with persistent, treatment-refractory insomnia, particularly when subjective complaints are disproportionate to objective findings and daytime functioning is relatively preserved. Objective assessment with sleep diaries, standardised scales, and polysomnography is essential to establish the diagnosis and to avoid unnecessary escalation of pharmacotherapy. Cognitive behavioural therapy directed at correcting sleep misperception, rather than further medication trials, is the appropriate management strategy and can achieve sustained clinical improvement, as demonstrated in this case.

Patient Perspective

Following psychoeducation and cognitive behavioural therapy, the patient reported reassurance after understanding that she had been sleeping despite

perceiving wakefulness. This understanding reduced anxiety surrounding sleep and improved confidence in non-pharmacological management.

Limitations

Objective sleep assessment was based on a single overnight polysomnography, and serial polysomnographic or actigraphic evaluations were not performed to assess longitudinal changes. The follow-up period was limited to six months, precluding assessment of the long-term durability of therapeutic benefit.

Statements and Declarations

Informed Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying clinical details.

Conflict of Interest:

The authors declare no conflict of interest.

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