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+15878858911
editorial-office@sciformat.ca

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MIGRAINE AND SLEEP: BIDIRECTIONAL RELATIONSHIPS, CLINICAL IMPACT, AND MANAGEMENT IMPLICATIONS — A STRUCTURED LITERATURE REVIEW

Zuzanna Ewa Kaźmierczak *[ZK] (Corresponding Author, Email: zuz.kaz7@wp.pl)*
Medical University of Warsaw, Warsaw, Poland
ORCID ID: 0009-0002-4435-9966

Szymon Antoni Kaźmierczak *[SK]*
Wolski Hospital in Warsaw, Marcina Kasprzaka 17, 01-211 Warsaw, Poland
ORCID ID: 0009-0004-3678-5126

Oskar Ratajczyk *[OR]*
Wroclaw Medical University, Wroclaw, Poland
ORCID ID: 0009-0000-7852-0880

ABSTRACT

Migraine is a disabling neurological disorder frequently accompanied by sleep complaints, including insomnia symptoms and poor subjective sleep quality. Growing evidence supports a bidirectional relationship: disturbed sleep may precipitate migraine attacks and contribute to greater disease burden, while migraine-related symptoms may disrupt sleep continuity and impair next-day functioning. This structured literature review synthesizes contemporary evidence on the migraine–sleep association, including the prevalence of sleep disturbances in migraine, mechanistic links between sleep dysregulation and migraine, clinically relevant comorbid sleep disorders, and management implications. A structured search of PubMed/MEDLINE, Scopus, and Web of Science identified English-language peer-reviewed publications (2015–2025), including observational studies, systematic reviews, meta-analyses, and clinical guidance documents. Across study designs, poor sleep quality is consistently more common in people with migraine and is associated with higher migraine burden. Emerging longitudinal and genetic epidemiology findings are compatible with reciprocal influences between insomnia liability and migraine risk. Clinically, the reviewed evidence supports routine screening for sleep problems in migraine care, targeted evaluation and treatment of comorbid sleep disorders, and consideration of evidence-based insomnia interventions as part of integrated management.

KEYWORDS

Migraine, Sleep Quality, Insomnia, Chronification, Obstructive Sleep Apnea, Restless Legs Syndrome

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Introduction

Migraine and sleep disturbances are common, burdensome conditions that frequently co-occur in clinical practice [1]. A growing body of evidence indicates that sleep problems in migraine are not only consequences of pain but may represent clinically meaningful comorbidities that influence attack frequency, disability, and treatment response [1, 10, 11]. Recent consensus work emphasizes structured, patient-centered care pathways for migraine, including assessment of comorbidities and lifestyle-related contributors that can modify outcomes [2].

Aim of the review. This structured literature review summarizes evidence on migraine–sleep associations, highlights bidirectional links with insomnia, and outlines practical implications for screening and integrated management.

Methodology

This review is based on a structured literature search in PubMed/MEDLINE, Scopus, and Web of Science for articles published between January 1, 2015 and December 31, 2025. The literature search was conducted on January 30, 2026. Search terms included combinations of: migraine, chronic migraine, sleep, sleep quality, insomnia, PSQI, sleep architecture, actigraphy, polysomnography, circadian rhythm, chronotype, obstructive sleep apnea, restless legs syndrome, chronification, melatonin, and behavioral sleep interventions. Included publications were peer-reviewed original studies, systematic reviews, meta-analyses, and clinical guidance documents in English. Records were screened for relevance to migraine and sleep outcomes or migraine-related clinical burden, and the selected evidence was synthesized thematically into the sections below.

Results

Prevalence of sleep problems in migraine

Across studies, sleep complaints are common in migraine cohorts, and standardized questionnaires frequently identify reduced sleep quality and insomnia symptoms compared with non-migraine controls[1, 3, 6, 10, 11]. Guidance papers emphasize that sleep assessment should be part of routine migraine evaluation, because multiple sleep disorders may coexist and modify migraine outcomes[10, 12].

Sleep quality and migraine burden

Observational research consistently links poorer self-reported sleep quality with higher headache frequency, disability, and overall migraine burden[3, 4]. Recent cross-sectional data also suggest that lower sleep quality may be associated with greater migraine severity and higher probability of chronic daily headache patterns in clinical samples[4].

Insomnia and risk of chronification

Insomnia symptoms appear particularly relevant for migraine prognosis. Clinical reviews describe insomnia, short/irregular sleep, and related sleep disturbances as modifiable contributors to migraine chronification and poorer outcomes[10, 11]. Mendelian randomization findings further support reciprocal influences between migraine and insomnia liability, consistent with a bidirectional relationship rather than a one-directional association[5].

Circadian variation and chronotype

Multiple studies indicate circadian and seasonal patterns in migraine attack onset, with many cohorts showing early-morning peaks, although heterogeneity exists[13–15]. Systematic reviews of migraine chronobiology additionally describe weekly and seasonal variations in some patient groups and highlight gaps in standardized reporting[13, 14]. Chronotype may influence migraine characteristics; for example, chronotype-related differences in attack frequency and duration have been reported[15]. These findings support considering sleep timing and circadian factors (not only sleep duration) in migraine assessment[13, 15].

Objective sleep findings

Meta-analytic evidence suggests that people with migraine report poorer subjective sleep quality and show alterations in sleep architecture compared with healthy controls [6]. In pediatric migraine, actigraphy studies have documented changes in sleep patterns around attacks and differences in interictal sleep measures, supporting the feasibility of objective monitoring in migraine research and care[16].

Comorbid sleep disorders: obstructive sleep apnea

The relationship between migraine and OSA appears complex. Population-based work has examined associations between migraine (with and without aura) and OSA risk[19], while other epidemiological analyses focus on headache phenotypes associated with sleep apnea[20]. A recent systematic review and meta-analysis

on headache prevalence in OSA reported that migraine occurs in a subset of OSA patients and highlighted substantial between-study heterogeneity[22]. Importantly, in patients with OSA and headaches, positive airway pressure therapy can be associated with headache improvement, supporting targeted screening when OSA symptoms are present[21].

Comorbid sleep disorders: restless legs syndorome

RLS is another sleep-related condition that may co-occur with migraine. Meta-analyses confirm an association between migraine and RLS, with some evidence suggesting stronger links in migraine with aura and chronic migraine[7, 17]. These findings support assessing leg discomfort/urge to move and related sleep disruption in migraine patients with persistent sleep complaints[1, 7].

Management implications: insomnia interventions

Evidence indicates that addressing insomnia can improve sleep outcomes and may reduce headache frequency in chronic migraine with comorbid insomnia. A randomized controlled pilot trial of CBT-I in chronic migraine showed improvements in insomnia outcomes and suggested benefits for headache outcomes[8], and subsequent analyses further supported the potential of CBT-I approaches in this subgroup[9].

Digital CBT-I has also been tested as a scalable approach in chronic migraine with insomnia complaints, demonstrating feasibility and acceptability and suggesting possible improvements in both insomnia and migraine measures[18]. Broader systematic reviews of psychological sleep interventions in migraine and tension-type headache report reductions in headache frequency and improvements in sleep outcomes, although the evidence base remains limited and heterogeneous, underscoring the need for larger controlled trials[25].

Chronobiology-oriented approaches have also been explored. Melatonin has been evaluated in randomized trials for migraine prevention, with mixed but generally supportive findings in some studies[23, 24]. A recent review of randomized trials suggests melatonin may reduce migraine frequency and severity, though dose-dependent effects and study heterogeneity limit firm conclusions[26].

Discussion

Overall, evidence supports a clinically meaningful link between migraine and sleep disturbance, with converging findings from questionnaire-based studies, systematic reviews, objective sleep meta-analysis, chronobiology research, and genetic epidemiology [1, 5, 6, 13]. While many associations are derived from cross-sectional designs, the directionality question is increasingly addressed by longitudinal and genetic approaches, supporting the practical rationale for routine sleep screening and integrated treatment[3, 5, 10].

From a clinical perspective, the literature suggests three actionable priorities: (1) systematic screening for insomnia symptoms and poor sleep quality in migraine patients; (2) evaluation for comorbid sleep disorders (particularly OSA and RLS) when symptoms indicate increased risk; and (3) integration of evidence-based sleep interventions (e.g., CBT-I) alongside standard migraine management when insomnia is present[10, 12, 25]. Future research should prioritize adequately powered randomized trials and incorporate objective sleep measures to clarify treatment effects and mechanisms across migraine subtypes, including migraine with aura.

Conclusion

Sleep disturbance is common in migraine and is associated with greater clinical burden[1, 3]. Emerging evidence supports bidirectional links between migraine and insomnia, highlighting sleep as a relevant and potentially modifiable contributor to migraine outcomes[5, 10]. Integrating routine sleep screening, treating comorbid sleep disorders, and considering evidence-based insomnia interventions may strengthen migraine care pathways and improve patient-centered outcomes[8, 18, 25].

Disclosure

Authors 'contributions:

Conceptualisation: ZK
Methodology: SK
Software: OR
Check: OR
Formal analysis: SK
Resources: ZK
Data curation: ZK, OR
Writing-rough preparation: OR
Writing-review and editing: ZK
Visualization: SK, OR
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