International Journal of Neurology Research

ISSN Print: 2664-908X
ISSN Online: 2664-9098
Impact Factor (RJIF): 6.08
IJNR 2025; 7(1): 28-34
www.neurologyjournals.com
Received: 10-07-2025
Accepted: 15-08-2025

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Treatment of insomnia in hypertensive patients in real-world setting: Insights from an Indian expert survey

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DOI: https://www.doi.org/10.33545/2664908X.2025.v7.i1a.31

Abstract
Background: Insomnia is commonly encountered by physicians in the real-world setting. Insomnia leads to impaired functioning across several, treatment-seeking for insomnia remains low.
Aim: To understand clinicians' perspectives on the management of insomnia in hypertensive patients in India.
Methodology: This insight study was a questionnaire-based survey conducted across India from December 2024 to February 2025 and involved 77 clinicians from the fields of internal medicine and cardiology across all zones of India.
Results: 77 clinicians participated in the survey. 86% clinicians opined that hypertension was the chief comorbid disorder associated with insomnia. For the treatment of newly diagnosed patients with insomnia, 60% clinicians preferred an approach of starting with both good sleep hygiene and pharmacotherapy. 78% clinicians preferred zolpidem instead of Benzodiazepines and lemborexant for managing insomnia in Indian patients. A high rating of 4 or 5 out of 5 were given by the clinicians for the key features of zolpidem such as fast and predicable onset of action (77%), preservation of sleep architecture (74%), low incidence of side effects (78%), lesser abuse/dependence potential as compared to BDZs (72%), and is recommended by guidelines. 87% clinicians preferred zolpidem for at least one month to treat insomnia in hypertensive patients.
Conclusion: Insomnia and hypertension have a bidirectional relationship. This survey provided invaluable insights from physicians regarding their approach to manage insomnia in hypertensive patients in India. Zolpidem may be the preferred treatment option instead of benzodiazepines and lemborexant for treating insomnia in hypertensive patients in a real-world setting.

Keywords: Insomnia, hypertension, zolpidem

Introduction
Insomnia is commonly encountered by physicians in the real-world setting, as prevalence estimates of insomnia in adults are highly variable across studies, ranging from 5% to 50%, with most data drawn from Western populations. [1] Insomnia refers not only to difficulty in falling asleep, but also includes frequent nighttime awakenings, a long lag time in falling asleep, early morning awakenings, or difficulty in maintaining sleep. Regardless of the type of insomnia symptom, the ultimate result is poor-quality sleep, which is responsible for depressive or irritable moods, loss of concentration, and impaired learning and memory capacities [2]. Chronic insomnia is a clinical diagnosis characterized by (a) difficulty initiating or maintaining sleep, (b) inability to sleep despite having adequate opportunities for sleep, (c) experiencing negative daytime impairment due to lack of sleep, and (d) sleep difficulty not explained by other sleep/medical disorder - with symptoms occurring at least 3 nights per week during a period of at least 3 months [3]. Although insomnia leads to impaired functioning across several domains (reduced work productivity, social participation, and increased risk of accidents), treatment-seeking for insomnia remains low [1].
Insomnia rarely occurs in isolation and is often comorbid with chronic health conditions, mood disorders, or psychiatric disorders. Sleep is essential to emotional and physical health, as inadequate sleep over a period of time increases the risk for obesity, diabetes, heart

disease, and depression. [4] This leads to challenges in treating insomnia effectively and understanding the clinical practices of clinicians [1].

Methodology

Survey Design

This questionnaire-based survey was conducted from December 2024 to February 2025 and involved 77 clinicians from the fields of internal medicine and cardiology across all zones of India. All participants were informed that participation in the survey was voluntary and that the data collected were anonymous, confidential, and restricted. The questionnaire was shared with clinicians through Microsoft Forms. Written informed consent was obtained from all participants before the initiation of the survey.

Survey questionnaire

A literature search across databases such as PUBMED, COCHRANE, MEDLINE, and Google Scholar was conducted for articles with keywords such as "Insomnia", "hypertension", "zolpidem" from January 2000 to December 2024. The results of these searches were used to create a questionnaire. The questionnaire was validated during focus group discussions among consulting physicians and cardiologists. The questionnaire (Supplementary information) consisted of questions on the prevalence of insomnia in hypertensive patients, clinical practice in the diagnosis & management of insomnia in hypertensive patients, including dose, duration, and preference of formulations, and clinical experience with the use of zolpidem. Participants were asked to respond to questions based on their experience with treating patients.

Data Analysis

The survey included 6 participants from the fields of cardiology and 71 from internal medicine. The collected anonymized responses were analyzed without any modification.

Results of the survey

Comorbid diseases associated with insomnia

Insomnia (sleep <7 hours) is associated with an increased risk of diabetes, hypertension, cardiovascular disease (CVD), metabolic syndrome, ischemic stroke, weight gain, psychiatric disturbances, and cognitive dysfunction. [5, 6]

The results of the Atherosclerosis Risk in Communities (ARIC) indicated that the complaint of either difficulty falling asleep (DFA) or waking up repeatedly was associated with an increased risk of hypertension. [7] Individuals with insomnia experience a higher risk of long-term mortality, myocardial infarction (MI), and incidence of CVD. [7]

Survey Question 1: In your clinical experience, Insomnia is more common in which patient profiles?

Patient profile	Number of responses from clinicians	% of responses
Hypertension	66	86%
Angina	1	1%
Myocardial Infraction	7	9%
Dyslipidemia	3	4%

Expert opinion

In the survey of Indian clinicians, hypertension was the chief comorbid disorder associated with insomnia (86% concurrence). Complications of hypertension, such as myocardial infarction and angina, were less often associated with insomnia. Only 9% clinicians opined that their patients with MI had insomnia.

Incidence of insomnia in hypertensive patients

In an Indian study, the prevalence of insomnia among the hypertensive population was approximately 47.2%.[8] Insomnia is associated with nondripping hypertension, target organ damage, and poor cardiovascular prognosis. [9, 10, 11]

Survey question 2: In your practice, what is the incidence of Insomnia in Hypertensive patients?

Incidence	Number of responses from clinicians	% of responses
<30	25	32
30-40%	27	35%
40-50%	16	21%
>50%	9	12%

Expert opinion

The majority of the clinicians (67%) opined that up to 40% of hypertensive patients have comorbid insomnia. A higher prevalence of insomnia in hypertensive patients (more than 40%) was reported by 33% clinicians.

Proportion of patients with Hypertension who actively complain about insomnia and poor sleep quality

A possible bidirectional association between hypertension and insomnia has been demonstrated in a meta-analysis of 23 prospective studies. [12] Early identification and prevention of insomnia in hypertension patients is needed, and vice versa. [12] Patients with hypertension and insomnia complain about fatigue, tiredness, lack of energy, irritability, reduced work performance, and difficulty concentrating [12].

Survey Question 3: In your clinical experience, how many patients with Hypertension actively complain about insomnia and poor sleep quality?

% of patients	Number of responses from clinicians	% of responses
<10%	9	12%
10-20%	27	35%
20-30%	26	34%
>30%	15	19%

Expert opinion

81% clinicians opined that only about 30% of patients with hypertension and comorbid insomnia actively complain about their insomnia symptoms and poor sleep quality. This indicates that a larger proportion of patients (70%) fail to discuss symptoms of insomnia with their physicians.

Physicians must consider adding questions about sleep disturbances in their history taking when treating patients with hypertension. Undiagnosed and untreated insomnia can have adverse effects on the control of hypertension and can increase the risk of cardiovascular disease. [7, 12]

Initial treatment approach in newly diagnosed cases of insomnia: Clinicians have three primary objectives in treating insomnia, namely: improving sleep quality, increasing sleep quantity, and consequently reducing the worsening of comorbid diseases associated with insomnia. The initial approach to the treatment of insomnia is counseling patients about good sleep hygiene, which includes stimulus control therapy. [12]

Psychotherapy, including multi-component cognitive behavioral therapy for insomnia (CBT-I), has been recommended as the primary treatment for insomnia by the American, Indian, and European Sleep Associations.

Survey Question 4: For a newly diagnosed case of Insomnia, which approach do you prefer?

Approach	Number of responses from clinicians	% of responses
Start with good sleep hygiene counseling alone	28	36%
Start with pharmacotherapy alone	3	4%
Start with a combined approach of Good sleep hygiene and pharmacotherapy	46	60%

Expert opinion

Only about 36% clinicians preferred initiating treatment with good sleep hygiene alone. 60% clinicians concurred that they choose an approach of starting with both good sleep hygiene and pharmacotherapy for the treatment of newly diagnosed patients of insomnia.

The preferred drug of choice for managing Insomnia patients: Several factors must be considered when choosing a drug to treat insomnia, including the patient's preference and experience with past treatments. Other factors to consider include the effect of the drug on sleep architecture, avoidance of hangover effect next morning after taking the drug, adverse effects of the drug, potential for development of tolerance and addiction, onset of action, effect of the drug, and safety profile in patients with comorbid diseases, drug interactions, and contraindications to the drug. [13]

Zolpidem is a non-benzodiazepine benzodiazepine receptor agonist that is approved for the short-term treatment of insomnia. It increases stage (S2) sleep and significantly lengthens slow wave sleep (SWS; stage 3). Zolpidem decreases the number of nocturnal awakenings, improves sleep quality, and has a low risk of causing residual effects the next morning. [13] Zolpidem significantly improves sleep quality by increasing total sleep period (TSP), total sleep time (TST), and sleep efficiency, and by shortening sleep latency. Thus, zolpidem helps in normalizing the disorder of initiating and maintaining sleep. [14, 15] Zolpidem is effective in patients with comorbid cardiovascular disease, such as heart failure (HF) [16].

Zolpidem has no adverse effect on attention, concentration, attention variability, numerical memory, fine motor activity, and reaction time measures [14]. Patients treated with zolpidem have reported ease of awakening and have been observed to have similar levels of alertness and contentedness as placebo. In elderly patients, after treatment with zolpidem, alertness is not affected, and they remain calm without any adverse residual effects the next morning [14, 17].

Benzodiazepines such as alprazolam are associated with disturbed sleep architecture, next-day hangover effect, development of tolerance, and also have high abuse potential. Benzodiazepines are associated with a higher risk of rehospitalization for HF compared with Z-drugs in patients with HF. [18] The dual orexin-receptor antagonist lemborexant (LEM) provides benefits on sleep variables. [19] In post-marketing surveillance studies of lemborexant, no serious adverse drug reactions or ADRs related to suicidal ideation or suicidal behavior were observed. [20]

Survey question 5: Which is your most preferred drug of choice for managing Insomnia patients? Table: The most preferred drug to treat insomnia in Indian patients

Preferred drug of choice	Number of responses from clinicians	% of responses
Zolpidem	60	78%
Benzodiazepines	16	20%
Lemborexant	1	1%

Expert opinion

Zolpidem was the most preferred treatment option to treat insomnia in Indian patients by 78% clinicians participating in the survey. Only 1% clinicians preferred lemborexant. The high cost of lemborexant precludes its extensive use in the real-world setting and hence, might not be an affordable treatment option for a large majority of patients. Only 20% clinicians opined that they prescribed benzodiazepines to their patients with insomnia.

The findings of the current expert survey corroborate that zolpidem continues to be a preferred drug to treat insomnia in the real-world setting.

The average duration of therapy for which Zolpidem is prescribed in Insomnia patients

Zolpidem has been used to treat insomnia for short durations ranging from 1 to 4 weeks. Zolpidem has been approved for short-term treatment of insomnia. [21]

Survey question 6: What is the average duration of therapy for which you prescribe Zolpidem to Insomnia patients?

Average duration of therapy	Number of responses from clinicians	% of responses
1 week	15	19%
2 weeks	25	32%
3 weeks	10	13%
4 weeks	27	35%

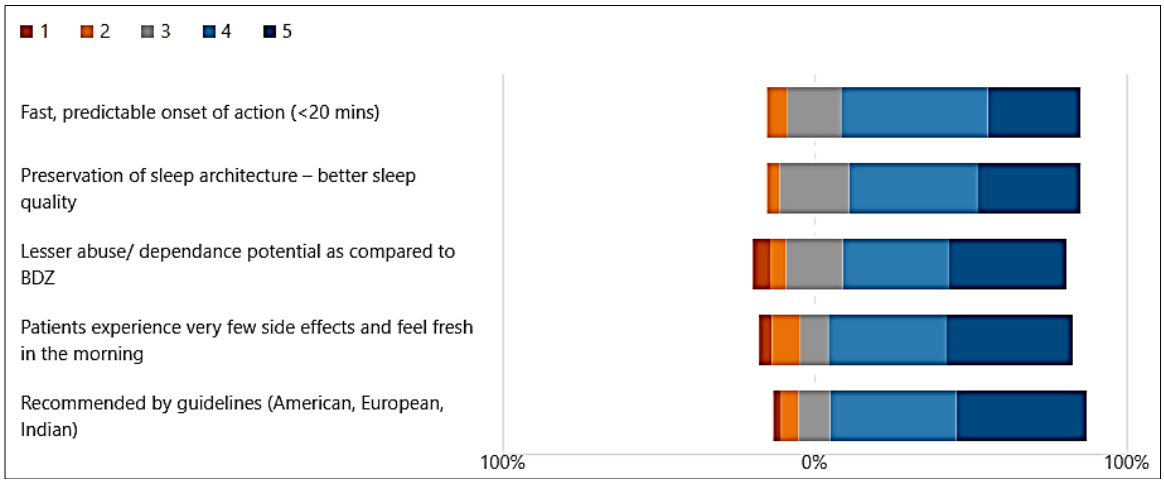
Expert opinion

About 48% clinicians opined that three to four weeks is the most common duration of treatment with zolpidem that they prefer to prescribe to their patients with insomnia. This practice is also in accordance with the recommended duration of 4 weeks by various guidelines for insomnia management [22, 23].

Rating the advantages of zolpidem

Zolpidem has minimal disturbing effects on sleep architecture. Zolpidem reduces the number of nocturnal awakenings and improves subjective sleep quality. [13] Zolpidem improves overall sleep quality and helps patients sleep through the night. These effects indicate there is little to no development of tolerance to the hypnotic effects of zolpidem [24]. Tolerance does not develop to the hypnotic effects of zolpidem owing to its selective mechanism of action at the benzodiazepine receptors [25]. Even after 4 weeks of treatment with zolpidem, patients had a significant increase in total sleep time (TST) and sleep efficiency compared to baseline. A persistent improvement in polysomnographic parameters of sleep initiation and maintenance (i.e., a decrease in sleep latency time, a reduction in wake time, and decreases in the number of arousals and periodic limb movements per hour of sleep) is observed with Zolpidem, without any significant change in sleep architecture. Hence, Zolpidem is preferred over benzodiazepines due to the lower incidence of side effects. [26] Zolpidem treatment results in improvement in sleep architecture from the first day of treatment. [27, 28].

Survey question 7: Rate the following points on a scale of 1 to 5 (5 being the highest) that are important advantages of Zolpidem over other drugs in the treatment of insomnia.



Expert opinion

A high rating of 4 or 5 out of 5 were given by majority of clinicians for the key features of zolpidem such as fast and predicable onset of action (77%), preservation of sleep architecture (74%), low incidence of side effects (78%), lesser abuse/dependence potential as compared to BDZs (72%), recommended by guidelines (American, European, Indian) (82%).

Duration of time required to normalize sleep patterns after treatment with zolpidem in patients with insomnia

In patients with comorbid disorders such as cirrhosis, sleep architecture has been reported to normalize after 4 weeks of treatment with zolpidem [24].

Survey question 8: After starting treatment with Zolpidem for Insomnia, how many weeks are required to normalize the sleep pattern of patients?

Number of weeks	Number of responses from clinicians	% of responses
1 week	16	21%
2 weeks	29	38%
3 weeks	7	9%
4 weeks	25	32%

Expert opinion

About 21% of clinicians reported that sleep architecture normalization occurs within 1 week after treatment with zolpidem, while 38% clinicians reported normalization after 2 weeks. A subset of clinicians (32%) differed in their opinion that normalization of sleep architecture occurs after 4 weeks of treatment with zolpidem.

Treating Insomnia with Zolpidem in patients with hypertension on antihypertensives

Pharmacotherapy of insomnia may decrease BP and assist in the treatment of high BP in patients with insomnia and hypertension [29].

Zolpidem has been used to treat insomnia for the past few decades across patient populations. It reduces the number of nocturnal awakenings, improves subjective sleep quality, and helps to improve nocturnal blood control [13].

People who show a predisposition to sleep trouble have a hyperactive sympathetic nervous system, usually suffer from hyperarousal, and have a more intense response to stressful events. Primary sleep troubles (insomnia) have no apparent causes, last more than one month, and affect approximately a quarter of the adult population. Comorbid insomnia is associated with chronic heart and/or lung diseases, medications that interfere with the onset or duration of sleep, constant changes in sleep habits, restless leg syndrome, etc. Besides lifestyle changes and cognitive-behavioral therapy, hypnotic medicines are advised to be prescribed for short-term management of insomnia [4].

In a study of elderly patients with hypertension and insomnia who had failed hypotensive monotherapy, treatment with zolpidem (10 mg single dose at night for 10 days) reduced arterial pressure at night [4].

Zolpidem treatment has been shown to significantly improve all the subjective parameters of sleep and 24-h BP profile, lower sleep and awake BP. Zolpidem treatment raised the efficacy of a hypotensive monotherapy in aged patients with isolated systolic arterial hypertension and insomnia [30].

Survey question 9: According to your clinical experience, do you recommend treating Insomnia with Zolpidem in patients with hypertension on antihypertensives, as it also helps in better control of Blood pressure?

Recommendation	Number of responses from clinicians	% of responses
Yes	67	87%
No clinica experience	10	13%

Expert opinion: 87% clinicians concurred that they prefer zolpidem to treat insomnia in hypertensive patients on antihypertensives, as it is also associated with improved control of blood pressure [31].

Survey question 10: In your clinical practice, how long do you prescribe Zolpidem to patients with Insomnia and Hypertension?

Number of weeks	Number of responses from clinicians	% of responses
1 month	37	48%
2 month	19	25%
3 month	11	14%
4 month	10	13%

Expert opinion

All the clinicians opined that they prescribed zolpidem for managing insomnia in hypertensive patients for at least a 1 month. Among them, 48% clinicians opined that they prescribed zolpidem for 1 month, while 24% prescribed zolpidem for 2 months, and about 28% clinicians opined that they prescribed zolpidem for 3 to 4 months.

Discussion

The results of this survey from Indian clinicians on treating insomnia in hypertensive patients have confirmed the high prevalence of insomnia in Indian patients with hypertension. Clinicians opined that up to 40% of hypertensive patients in India have insomnia. However, 81% clinicians opined that just about one-third of patients with hypertension and insomnia complain about symptoms to their physicians. About 60% of clinicians concurred that both good sleep hygiene and pharmacotherapy are used during the initial treatment of insomnia in newly diagnosed patients. These practices are similar to those used globally for managing insomnia. Several factors must be considered when choosing a drug to treat insomnia. These factors include patient preferences and the patient's experience with past treatments. Zolpidem was the most preferred treatment option to treat insomnia in Indian patients by 78% clinicians. About 48% clinicians opined that three to four weeks is the most common duration of treatment with zolpidem that they prefer to prescribe to their patients with insomnia. Zolpidem has a good efficacy profile and can be a cost-effective treatment option for treating insomnia. Indian clinicians have given a high rating of 4/5 or 5/5 for key features of zolpidem, such as fast and predictable onset of action, preservation of sleep architecture, and low incidence of side effects.

Limitations of the current survey are that it is an experience-based survey involving 77 physicians across India. A head-to-head comparison of zolpidem versus different drugs used to treat insomnia in patients with hypertension and other comorbid diseases is warranted.

Conclusion

Insomnia and hypertension have a bidirectional relationship. About 40% of patients with hypertension have insomnia, but only about one-third of patients actively complain of insomnia. The choice of treatment for insomnia is cognitive behavioral therapy. However, CBT-I is not readily available due to a shortage of trained personnel. Based on the survey results, zolpidem can be the preferred treatment option compared to benzodiazepines (BDZs, such as alprazolam and clonazepam) and lemborexant for the treatment of insomnia in hypertensive patients in a real-world setting.

Acknowledgements

We would like to thank Clinical Medicine Infomatics - India for their editorial support funded by Abbott India Limited.

Declarations

- **Funding:** The review was supported by Abbott India Limited
- **Conflict of Interest:** The authors received all support for this manuscript from Abbott India Limited
- **Ethical Approval:** Not required

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