

Chronic Insomnia, Pharmacotherapy and the Cognitive Behavioral Approaches

Mohammad Torabi Nami*

Department of Neuroscience, School of Advanced Medical Science and Technology, Shiraz University of Medical Sciences, Shiraz, Iran

Abstract

Insomnia is a common complaint of patients presenting to primary care physician and sleep medicine experts. Approximately 10-20% of the general population worldwide has reported symptoms of chronic insomnia of which 25% have primary insomnia. Insomnia is more prevalent among females and the elderly subjects (over 65 years). Pharmacotherapy for insomnia is mainly focused on hypnotics such as benzodiazepine receptor agonists (BzRAs), antihistamine drugs, tricyclic antidepressants like doxepin, and a melatonin receptor agonist (ramelteon). However, these very often used medications are shown to have potential untoward effects outweighing their benefits in many instances. Once the underlying disorder affecting sleep is appropriately addressed, cognitive behavioral therapy, singly or combined with drug therapy, is demonstrated to be amongst the most efficacious treatment strategies in some cases with refractory insomnia.

Keywords: Insomnia; Cognitive and behavioral therapy; Pharmacotherapy; Sleep hygiene; Recommendations

Insomnia; Not Only a Prevalent But also a Consequential Sleep Disorder

The different aspects of the complex physiological process of sleep are yet to be understood and despite all so far efforts, sleep remains one of the great mysteries of science [1-3]. Insomnia which is resulted from problems with sleep initiation and maintenance is considered as one of the most prevalent health issue and a widely encountered challenge in clinical practice [4-6]. Due to many potential causes for insomnia, unfamiliarity with non-pharmacological treatments, and existing concerns about the challenges faced with pharmacological approaches, many health care professionals seem reluctant to efficiently address insomnia in their practice [4,6]. Physicians should expand their awareness on the advances in treating insomnia due to its potential effects on function and general health [6].

We may even quantify to what extent insomnia has negatively affected one's quality of life. Some recently validated and currently available sleep-health indices such as the Glasgow Sleep Impact Index (GSII) make measuring the impact of insomnia on sleep-related quality of life impairment possible [7]. Meanwhile, further attempts should be done to develop further psychometric and clinical evaluation tools available to assess the neurocognitive and health-related burden of chronic insomnia [8,9].

Although the pathophysiological aspects of insomnia are described in the literature [6], many contributing mechanisms for this disorder have remained unraveled. The question of "nature or nurture" has also existed for insomnia. Both sleep-wake related mechanisms and stress-response-related gene-environment interactions are shown to play a role in our brain plasticity [10]. There are some recent theories on the epigenetic mechanisms involved in insomnia and gene-environment interactions which regulate this disorder [11].

Based on the International Classification of Sleep Disorders (ICSD), 2nd edition, insomnia is characterized as "difficulty initiating and/or maintaining sleep, early awakening or non-restorative sleep despite adequate opportunity" [12]. This needs be accompanied by at least one of the following complaints during the day: fatigue and daytime sleepiness, lapses in attention, concentration or impaired memory

function, poor performance in social, occupational or academic perspectives, irritability or dysregulation in mood, motivation, energy or initiative. Moreover, insomniacs are notably prone to errors or accidents at work or while driving [6,9]. Reports indicate that insomniacs suffer from tension headaches or GI distress due to sleep loss and worries about sleep [5,6,9,10,12].

The ICSD differentiates insomnia either as primary or secondary [12]. Primary insomnia includes idiopathic insomnia, psychophysiological insomnia and paradoxical insomnia. Secondary insomnia includes insomnia secondary to psychosocial stressors, psychiatric disorders, medical disorders, various sleep disorders, drug and substance abuse and prescription medications. Misuse of some medications which are thought to help sleep may profoundly lead to poor sleep and unfavorable neuro-cognitive consequences [12-15].

Over the past few years the term comorbid insomnia is preferentially used instead of secondary insomnia. Comorbid insomnia implies that insomnia in subjects with other health conditions is as significant as the underlying disorder and hence requires independent assessment and treatment [13].

Distressed emotion, lack of energy and profound fatigue, sleepiness and impaired functioning during the daytime, are shown to be some cardinal consequences of insomnia. Furthermore, impairment is social and occupational performance adversely affects the quality of life. As reports indicate, insomniacs tend to be at increased risk for mental health problems, substance abuse and cardiovascular morbidity [6].

***Corresponding author:** Mohammad Torabi Nami, MD, PhD, Department of Neuroscience, School of Advanced Medical Science and Technology, Shiraz University of Medical Sciences, Shiraz, Iran, Tel: 98 711 2333138; Fax: 98 711 2343848; E-mail: torabinami@sums.ac.ir

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When physicians tend to approach this condition, taking a thorough clinical history is often the least thing needed to identify the contributing factors [5]. Where hypnotic medications are perceived efficacious, they must be carefully monitored for adverse effects [4,16,17]. In parallel, behavioral therapeutic approaches should be used whenever indicated and possible [18,19]. The focus of this review is putting together the current options and strategies for the treatment of insomnia and discussing the concurrent approaches (i.e. pharmacotherapy in presence of cognitive-behavioral approaches) which may provide a better outcome in some cases with insomnia.

Pharmacological Approaches in Treating Insomnia, Merits and Demerits

Recent critical reviews and meta-analyses have elaborated on the advantages and disadvantages of pharmacotherapy in insomnia [4,5]. Although efficacious in many instances, sleep aid medications must be carefully monitored for their potential adverse effects. Some approved hypnotics including benzodiazepine receptor agonists (BzRAs), antihistamine drugs, tricyclic antidepressants like doxepin, and a melatonin receptor agonist (ramelteon) are being widely used for insomnia management, whereas some other still approved medications for insomnia such as barbiturates and chloral hydrate are far from recommendation due to their potential toxicity [4]. Meanwhile; anxiolytic benzodiazepines [20], sedating antidepressants [20], atypical anti-psychotics [21], and anticonvulsants [4,20] are being increasingly used in insomnia although not approved for this indication. Given these medications' safety issues relative to their modest efficacy in many instances, there remain persistent concerns for the routine use of hypnotic medications in insomnia. When the primary clinical diagnosis is insomnia, the short-course prescription of hypnotics may become warranted while their long-term use possibly results in lack of efficacy and physical or psychological dependence [5,17,20]. Considering the untoward effects of hypnotics, elderly patients with insomnia and those with underlying medical problem with complex pill regimens should preferably receive behavioral therapies for insomnia rather than add-on hypnotic medications [17]. The popular over-the-counter melatonin is shown to more exert regulatory effects on disrupted chronobiology rather than possessing hypnotic properties [4]. Meanwhile, the advent of a new class of evolving drugs for primary insomnia known as dual orexin receptor antagonists (DORA) are underway and their primary efficacy and safety results are intriguing [22].

Cognitive and Behavioral Approaches in Insomnia

Sleep logs

Sleep logs, when completed properly, are useful not only in the assessment of insomnia but also in its management and monitoring progress.

Sleep logs provide information on sleep patterns of patients in their own environments. They also assist to assess the impact of therapeutic interventions, help to monitor progress over a period of time and help patients to realize that insomnia may not be as frequent or as severe as they had thought (e.g. paradoxical insomnia) [17].

Sleep hygiene

Sleep hygiene refers to a set of instructions that help patients fall and stay asleep. Sleep hygiene measures, on their own are not effective in the treatment of insomnia [16]. However, they provide a framework for other therapeutic interventions. Some of sleep hygiene measures that can be recommended to patients include maintaining a regular

waking time and removing from the bedroom anything that could impair sleep. Patients are usually advised to strictly avoid alcohol, caffeine, nicotine and heavy exercise several hours before bed time. Patients should neither take large meals before going to sleep nor go to bed hungry or thirsty, and finally they should avoid naps during the day [23].

Stimulus control

The goal of stimulus control is to assist patients re-associate bed with sleep. Some of the recommended behaviors include not going to bed until ready to sleep, using bed only for sleep (sex is an exception). Patients should avoid reading, watching TV or eating in bed and are recommended to set an alarm to get up at the same time every morning [23,24].

Biofeedback

There is compelling interest in using biofeedback as a technique to train individuals in order to improve their health by means of developing better awareness or voluntary control over the physiological processes which are affected by anxiety or stress. In this technique, the level of anxiety or stress is measured by fixing electrodes or sensors on the scalp, forehead, around the trunk and on the fingertips that record biological signals. The biofeedback setup and the type of sensors used depend of what specific technique is applied.

With regard to the treatment of insomnia, two types of biofeedback including electromyography (EMG) biofeedback and sensory-motor rhythm (SMR) biofeedback are commonly applied. EMG biofeedback is found to be effective in anxious individuals who have sleep-onset insomnia, and SMR biofeedback is found to be effective in non-anxious individuals who have sleep maintenance insomnia. The therapist acts as a coach by facilitating patient relaxation, which further reduces stress and anxiety [8,16,25]. Relaxation is a key component in biofeedback [25].

Sleep restriction

Sleep restriction is based on the premise that time spent in bed awake makes insomnia worse. When appropriately applied, sleep restriction is shown to improve sleep efficiency by almost 85% and to consolidate sleep. Subjects are trained to stay in bed only when they are asleep. They are then allowed to increase "time in bed" by 15-20 minutes each night, only if their sleep efficiency exceeds 90%. Consequently, the time they spend in bed should be 15-20 minutes each night in case their sleep efficiency is below 90% [24].

Cognitive and Behavioral Therapy for Insomnia (CBTi)

Other than sleep hygiene consideration in changing life style and behaviors enacted before going to bed, CBTi is an effective non-pharmacological approach to treat insomnia [16,17,19]. The main behavioral and cognitive ingredients of CBTi are as follow:

1. Stimulus control: the rationale is to establish associative links between bed and sleep, overcoming the existing conditioned inability to sleep. e.g. The 15 minutes rule for getting out of bed.
2. Sleep timings: patients are encouraged to maintain a sleep schedule compatible with their sleep regulating systems also during weekends avoiding compensative attempts to sleep.
3. Reduction of the time spent in bed, i.e. sleep restriction.
4. Relaxation: simple techniques like progressive muscular

relaxation and meditation are promoted within the CBTi program.

5. Cognitive restructuring and control: experience-based revision of worries about insufficient sleep; simple strategies to avoid the presence of intrusive thoughts in bed before sleeping.
6. Paradoxical intentions: the effort to stay awake can be used to contrast the effort to sleep, typically reported by insomniacs.

The therapeutic process in CBTi encompasses restoration of dysregulation in processes C and S plus behavioral and cognitive changes. The goal of cognitive therapy for insomnia is to identify and correct dysfunctional beliefs and attitudes relating to sleep. Patients can be taught facts and techniques such as: 1- sleep needs differ and not everyone needs eight hours of sleep a night, 2- learn not to worry or get frustrated if you are not sleeping, 3- learn to do thinking and worrying during the day instead of at night- in bed at night, use thought stopping and thought switching to reduce worries, 4- lying in bed resting peacefully is nearly as restorative as sleep, and it is much more restorative than lying there thinking and worrying and 5- for patients who have not been helped by other methods, paradoxical injunction can be used (to reduce the anticipated anxiety associated with trying hard to sleep, patients are requested to stay awake as long as possible) [17-19,25,26].

The combination of cognitive and behavioral therapies for insomnia (CBTi) with pharmacotherapy has not only been shown to be more effective, but also the effects last longer compared to pharmacological treatment alone [18]. In some instances, the concurrent therapy using both pharmacological and behavioral approaches is the only way to help symptoms [18]. The full-fledged treatment package which comprises both pharmacotherapy and behavioral interventions may then be de-escalated to cognitive behavioral therapy alone in long run [4,5,16,20,25]. The above therapeutic measures have also demonstrated to positively influence polysomnographic variables [27]. The improved variables following appropriate treatment of insomnia include increased total sleep time (lights out to lights on time spent asleep) and sleep efficiency (total sleep time divided by the time in bed in minutes expressed in percentage) and decreased sleep onset latency (time in minutes to the first epoch of sleep from lights out) and wake time after sleep onset (time in minutes awake after the first epoch of sleep) [27,28].

Comment

Primary care physicians seem to need to optimize their knowledge and practice with regard to pharmacological and non-pharmacological approaches in treating insomnia. CBTi has been found to offer valuable therapeutic benefits when applied for the right patients and in the right setting. Apart from the need to run basic etiopathophysiological studies to further explore the underlying causes of insomnia and other neuroscience researches to further elucidate the nature of this disorder some more actions are needed to provide primary care physicians with management updates on prevalent disorders such as insomnia. Incorporating practical lessons for the management of insomnia, hypersomnia and other common sleep disorders into the continuous medical education courses designed for health care professionals (CME), is expected to result in a more evidence-based practice when they encounter sleep-related complaints raised by their patients.

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