NON-PHARMACOLOGICAL MANAGEMENT OF CHRONIC INSOMNIA IN CLINICAL PRACTICE

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ABSTRACT

Insomnia is a common complaint in primary care and psychiatric settings. It can present independently or co-morbidly with a medical, a psychiatric or a sleep disorder. It is important to recognize and treat insomnia independently in addition to treating the co-morbid condition. Non-pharmacological treatments include various approaches, which mainly include Cognitive Behavioral Therapy for Insomnia (CBT-I). Cognitive Behavioral Therapy for Insomnia is the first line treatment in addition to pharmacological therapies. This review focuses on describing non-pharmacological approaches, mainly CBT-I and provides specific techniques for implementation of these approaches.

KEYWORDS

Insomnia, non-pharmacological, cognitive behavioral therapy.

INTRODUCTION

This article reviews various non-pharmacological treatment approaches used to manage insomnia and presents ideas of implementing these techniques. In addition, some of the complimentary therapies used in insomnia are also discussed.

Insomnia is one of the most common sleep related complaints in primary care settings.[1] It is thought to be present when patient reports inadequate sleep quantity or sleep quality in conjunction with daytime impairment attributed to sleep deficiency. It is typically defined as difficulty initiating or maintaining sleep or early morning awakening with inability to return to sleep with dissatisfaction with the quality of sleep.[2]

Approximately 25% of adults are dissatisfied with their sleep[3] and 10-15% report insomnia complaints associated with daytime consequences.[4] Patients may report difficulty with initiating sleep, with maintaining sleep, or both. It can present independently or co-morbidly with other medical or psychiatric disorders.

Historically, insomnia has been divided into "primary" and "secondary" insomnias. More recently, term "co-morbid insomnia" was preferred to emphasize the need to treat insomnia in addition to the co-morbid condition. For example, with insomnia and depression co morbidity, treating both disorders simultaneously results in better outcomes.[5, 6] There were some critical challenges with this approach. For example, does the dichotomy of primary and co morbid provide a clinically meaningful distinction? At some level it does, but beyond the clear need for treatment of co morbid conditions, it does not substantially alter therapies. For this reason in Diagnostic Statistical Manual 5th Edition (DSM 5), it was decided to change "primary insomnia to just "Insomnia disorder" with specifiers. Please see table 1 for DSM 3 diagnostic criteria and table 2 for key differences between DSM IV and DSM.[5]

Though definitive pathological mechanisms have not been identified, many neurobiological abnormalities are associated with insomnia. It is thought that individuals with insomnia show increased activation of autonomic nervous system activity during sleep and wakefulness.[7] The course of insomnia is understood by looking at 3 contributing factors: Predisposing factors (such as age, sex, hyperarousibility, anxiety-prone personality, family history), precipitating factors (illness, separation, stress) and perpetuating factors (irregular sleep-wake scheduling, fear of insomnia, maladaptive behaviors like watching television).[8]

Dissatisfaction with quality of sleep is included in the DSM 5 criteria of insomnia. Poor sleep quality is associated with psychiatric disorders such as post-traumatic stress disorder and depression.[9] In addition, poor sleep is associated with an increase risk of mood disorders and can exacerbate psychiatric symptoms.[6]

It is important for the mental health providers to understand that insomnia can be caused by a number of co-morbid psychiatric, medical and sleep disorders. Careful history should be taken as a part of insomnia evaluation. Please see box 1 for a summary

of clinical evaluation of insomnia. (Box 1: Clinical evaluation of insomnia.)

A number of non pharmacological treatments have been found to be effective for treating insomnia. Most of them fall under the umbrella category of Cognitive Behavioral Therapy for Insomnia (CBT-I). Some authorities include sleep hygiene under CBT-I and others don't. Maladaptive thoughts and beliefs such as "I need 8 hours of sleep for sure" and "I will get sick if I don't fall asleep" are targets of cognitive therapy part of CBT-I whereas maladaptive behaviors such as watching television in bed and spending a lot of time in bed are targets of behavioral part of CBT-I.

SLEEP HYGIENE/SKILLS EDUCATION

Sleep hygiene are set of factors that are helpful in maintaining good sleep.[10] Some examples of sleep hygiene include maintenance of regular sleep-wake schedule, limiting use of caffeine and alcohol, avoiding naps, eliminating noise and light from sleep environment, using the bed only for sleep and not repeatedly looking at the clock.

In one study performed in a partial hospitalization setting, sleep quality improved in patients who underwent sessions of sleep skills education as compared to the ones who did not, but the improvement was not statistically significant.[11] In addition, the authors felt that providing the structure of partial hospitalization was a factor in improving sleep quality and sleep efficiency in this study.[11] The American Academy of Sleep Medicine does not recommend sleep hygiene/skills education as stand alone therapy for insomnia.[12]

Simply teaching patients about sleep hygiene does not mean that they will practice good sleeping habits. Motivating patients to follow these principles may be required. Authors have found these guidelines helpful in their practice to motivate and encourage patients to adopt good sleeping habits:

1. Get a detailed sleep history to identify specific behav iors that need to be changed. For example, patients who watch television in bed may need to change just that in order to get a good night's sleep.
2. Discuss sleep on a regular basis, as patients may need more than one session to disclose their poor sleeping habits.
3. Give handouts of sleep hygiene principles and highlight the areas most pertinent for each patient. Ask them to place it where they can see it and review it periodically/regularly.
4. Involve the family in motivating patients and imple menting sleep hygiene principles in their lives.
5. Explain the rationale for changing each behavior. For example when instructing them not to drink coffee or alcohol at night, teach them the negative effects of

Box 1:

SLEEP HISTORY

A detailed careful clinical history is a cornerstone in evaluation of insomnia. The clinician should assess the nature, frequency and duration of symptoms of insomnia, their response to treatment and relationship with other stressors. Clinicians should consider reviewing the entire 24-hour day as sleep and wakefulness affect each other in a complex manner. Patients often seek help due to daytime symptoms of fatigue, and irritability due to poor sleep at night.

MAIN ELEMENTS OF THE SLEEP HISTORY ARE

TEMPORAL ASPECTS: Times at which the patient goes to bedroom, attempts to fall asleep, wake up times in the middle of the night and times he or she gets out of bed in the morning.

QUANTITATIVE ASPECTS: Time it takes to fall asleep; number and duration of awakenings; wakefulness after sleep onset; total sleep time.

BEHAVIORAL AND ENVIRONMENTAL FACTORS AFFECTING SLEEP: activities which are nonconducive to sleep (phone, I pad, television etc); bed partners causing disturbance etc.

SYMPTOMS OF OTHER SLEEP DISORDERS: snoring, breathing pauses, restless legs symptoms (urges to move legs); parasomnias (unusual sleep behaviors); circadian rhythm disorders (delayed sleep phase syndrome, jet lag, shift work)

DAYTIME EFFECTS OF POOR SLEEP: napping, irritability, social and family stress, caffeine and tobacco use.

MEDICAL AND MENTAL HEALTH HISTORY

Evaluation of insomnia should include a medical/psychiatric history and a physical examination to recognize co-morbid disorders that can worsen or be worsened by insomnia.
Psychiatric disorders include depression; bipolar disorder; anxiety disorders; post traumatic stress disorder; substance use disorders.
Medical disorders include neurological disorders; pulmonary conditions (COPD, asthma); pain related conditions; arthritis; endocrine conditions; congestive heart failure etc.
Medications which can cause insomnia include several in addition to antidepressants; sedatives; antihypertensives;stimulants, steroids, etc
Useful, but underutilized tool is sleep diary, which is very effective in engaging patients with their treatment.

these substances on sleep. Similarly when instructing them not to watch television in bed, tell them that using the bed only for sleep will help them condition themselves to sleep when they retire to bed at night. In addition, light from the television might delay sleep onset.

6. Encouraging patients to keep a sleep diary will help examine their sleep patterns and recommending changes appropriately.
7. Limit the use of computer closer to the bed time.
8. Avoid strenuous exercise late at night.

We recommend discussing sleep hygiene on a regular basis and involving patients to come up with their own creative ideas for change. Improving sleep hygiene can have long-term beneficial effects on (our) patient's mental and physical health.

STIMULUS CONTROL THERAPY

Bootzin et al [13] first evaluated stimulus control therapy for psychophysiological insomnia (conditioned insomnia). The goal of the therapy is to interrupt the conditioned activation response that occurs at bedtime. These techniques help patients establish a regular sleep/wake schedule, establishing bed and bedroom as cues for sleep, reducing association with activities that might be stimulating. Patients are given the following instructions:

1. Lie down and sleep only when you are feeling sleepy.
2. Use your bed only to sleep; that is not to use it as a living couch. You should not watch TV in your bedroom, read or eat in your bed. (Sexual activity is the only exception to this rule).
3. If unable to fall asleep, get up and go into another room. Stay up as long as you do not feel sleepy again. Watching the clock is not recommended. If unable to sleep for more than 10-20 minutes, get up and try a quiet activity. The goal is to associate your bed with falling asleep quickly.
4. Set alarm to get up at the same time every day regard less of the time you have slept. This will help your body acquire a regular rhythm.
5. Do not take a nap during the daytime if it disrupts your sleep at night.

These instructions are not only found to be effective for initiating sleep but also for maintenance in older patients who tend to wake frequently.[14] Stimulus control therapy is recommended as a standard treatment by American Academy of Sleep Medicine.[12]

SLEEP RESTRICTION

Sleep is regulated by circadian and homeostatic drive. This treatment increases homeostatic drive by reducing time spent in bed and maintaining consistent wake time in the morning. Many individuals with insomnia have poor sleep efficiency, i.e.; they spend a significant amount of time in bed not sleeping, but trying to fall asleep. Patients are instructed to limit the time they spend in bed to the number of hours of sleep they usually get. This helps consolidate sleep by using the homeostatic drive (the longer one is awake, more sleepy one gets). Patients are instructed to restrict their time in bed to the average

Table 1: DSM 5 Criteria for Insomnia disorder

A. Predominant complaint of dissatisfaction with sleep quantity or quality, associated with one or more of the following symptoms:
1. Difficulty initiating sleep. (In children, this may manifest as difficulty initiating sleep without caregiver intervention.)
2. Difficulty maintaining sleep, characterized by frequent awakening or problems returning to sleep after awakenings. (In children, this may manifest as difficulty returning to sleep without caregiver intervention.)
3. Early morning awakening with inability to return to sleep.

B. The sleep disturbance causes clinically significant distress or impairment in social, occupational, educational, academic, behavioral, or other important areas of functioning.
C. The sleep difficulty occurs at least 3 nights per week.
D. The sleep difficulty is present for at least 3 months.
E. The sleep difficulty occurs despite adequate opportunity for sleep.
F. The insomnia is not better explained by and does not occur exclusively during the course of other sleep-wake disorders (e.g.; narcolepsy, a breathing related sleep disorder, a circadian rhythm sleep-wake disorder, a prasomnia).
G. The insomnia is not attributable to the physiological effects of a substance
H. Coexisting mental disorders and medical conditions do not adequately explain the predominant complaint of insomnia

SPECIFY IF

With non-sleep disorder mental co morbidity, including substance use disorders
With other medical co morbidity
With other sleep disorder

SPECIFY IF

Episodic: Symptoms last at least 1 month but less than 3 months.
Persistent: Symptoms last 3 months or longer.
Recurrent: Two (or more) episodes within the space of 1 year.

number of hours they sleep. They are asked to increase time in bed by 15-30 minutes when the time spent asleep is equal or greater than 85% of time spent in bed.[12]

CHRONOTHERAPY

Chronotherapy is treatment of insomnia and circadian rhythm disorders in which patient's sleep/wake rhythm is out of phase with the time they choose to sleep.[15] It is specifically useful for patients with delayed sleep phase (a disorder in which there is a tendency for patients to fall asleep late at night as their biological clock's sleep time is delayed). Bedtime is successively delayed by daily increments of 3 hours until sleep onset coincides with the desired time to sleep. Patients are then instructed to maintain their regular sleep/wake schedule.

COGNITIVE THERAPY FOR INSOMNIA (CBT-I)

Cognitive therapy identifies, challenges and modifies dysfunctional beliefs and attitudes towards sleep and sleep deprivation. These beliefs increase arousal and stress that prevent sleep and further reinforce these maladaptive beliefs.[16] Maladaptive beliefs unnecessarily increase "performance anxiety" towards sleep. One of the main focuses of treatment is to change the patient's view of his or her sleep problems from being a victim to being able to cope with the problem.

Some patients get anxious when they try to go to sleep. The harder they try to sleep, the more difficult it is to fall asleep as they have associated getting more anxious to "trying to sleep." Paradoxical intention, an intervention in which patients are instructed to try not to sleep has shown mixed results. In these patients worrying about whether they will be able to sleep or not makes it even harder to sleep. Some of these patients may benefit from this technique.

RELAXATION TRAINING, MEDITATION, AND BIO FEEDBACK

Relaxation training is a commonly recommended treatment of insomnia. This includes practice of progressive muscle relaxation, yoga and hypnosis. The basic principle is that if patients are able to relax at bedtime, they will fall asleep faster. The relaxation techniques have additive benefits for the anxious and worried insomniac patients.

PHARMACOLOGICAL TREATMENTS WITH NON-PHARMACOLOGICAL THERAPIES

Benzodiazapines are widely prescribed for insomnia.[17] Clinicians commonly prescribe the non-benzodiazepines drugs because of their low abuse potential. Patients once on benzodiazepines are reluctant to stop the medications because of the fear of worsening of insomnia and withdrawals. The severity of withdrawals is related to the dose, duration of use and pharmacology of the agent. Short half-life agents (e.g. tiazolam, alprazolam) can cause stronger withdrawal than cause by intermediate half-life benzodiazapines (e.g., Temazepam) or longer half-life agents (e.g. clonazepam).

Non-pharmacological approaches like CBT-I and drug treatment can have added effect for treatment of insomnia. Combined approaches have advantage of using immediate and potent effects of hypnotics and more long-term effects of non-pharmacological/CBT-I. One recent study [17] suggested starting out with both CBT-I and pharmacological treatment and then tapering off the medication in the course of treatment as compared to as needed use of medications with CBT-I. Another study,[18] discouraged the use of "as needed intermittent" dosing of hypnotics with behavioral therapy.

Non-pharmacological approaches may take more time and effort to work, need extra work on the part of patients and clinicians, but they have advantages of longer lasting effects and are without the risk of dependence.

Although these techniques are fairly straight forward and simple, but having a deeper understanding and ability to explain the rationale of these techniques further help implementing them and helping patients adhere to them rather than going for a quick fix with medications.

COMPLIMENTARY AND ALTERNATIVE MEDICINE AND INSOMNIA

Acupuncture, acupressure, aromatherapy, homeopathy and massage therapies are some of the Complimentary and Alternative Medicine therapies (CAM) therapies used to treat insomnia. Several CAM or "natural pharmacotherapies" such as Kava, Valerian Root, Valerian Hops and L-Tryptophan have been used to help with insomnia. A recent meta-analysis[20] reviewed 16 CAM therapies (e.g.

Table 2: Main differences between DSM 5 and DSM IV criteria for insomnia

1. DSM 5 uses the terminology, "Insomnia disorder" vs. "primary insomnia"
2. The chief complaint is changed from "difficulty initiating or maintaining sleep" in favor of "sleep dissatisfaction"
3. "Dissatisfaction with sleep quality and quantity" used in DSM 5 instead of "nonrestorative sleep" in DSM IV
4. "Early morning awakening" is added to core diagnostic criteria of "difficulty initiating sleep" and difficulty "maintaining sleep" as all three complaints are common in insomnia
5. Sleep disturbance duration is 3 months in DSM 5 vs. 1 month in DSM IV
6. A minimum insomnia frequency of 3 nights per week is added in DSM 5 Provision of "adequate opportunity for sleep" is added to make the important difference between insomnia and sleep deprivation or restriction

Acupuncture, acupressure and yoga) and 20 CAM interventions (e.g. L-Tryptophan, Kava and Valerian Root) for insomnia. Authors identified 64 Randomized Controlled Clinical Trials and 20 of those met their inclusion criteria. It found evidence for use of acupressure and yoga, mixed evidence for acupuncture and limited or no evidence supporting use of herbal remedies such as Valerian root. We agree with the conclusion that further research about CAM approaches and insomnia using robust methodology and larger sample size is needed.

CONCLUSION

A number of (non pharmacological) therapies are effective for treatment of chronic insomnia in addition to growing pharmacological treatments available. Studies suggest that the combination of various techniques is most effective when used as an individualized approach. Stimulus control instructions appear to provide greater benefits in some studies and are recommended by American Academy of Sleep Medicine.

Clinical practice calls for individualizing the treatment of each patient, depending upon the needs, psychiatric condition and co morbid medical problems of the patients. More research is needed to evaluate the effectiveness of these non-pharmacological therapies in comparison with the commonly used and easily prescribed pharmacological treatments. We encourage the physicians and clinicians to consider using these behavioral approaches first before deciding to use pharmacological treatments because of the safety and long-term benefits of these techniques.

REFERENCES

1. Hoghagen F, Rink K, Kappler et al. Prevalence and treatment of insomnia in general practice. A longitudinal study. Eur Arch Psychiatry Clin Neurosci 1993; 242:329-36.
2. American Psychiatric Association. Diagnostic Statistical Manual of Mental Disorders, 5th Edition. Washington, DC. London, England.
3. Morin CM, LeBlanc M, Daley M, Gregoorie JP, Merette C. Epidemiology of insomnia: prevalence, self help treatment, consultations and determinants of help-seeking behaviors. Sleep Med 2006; 7:123-30.
4. Ohayon MM. Epidemiology of insomnia: what we know and what we still need to learn. Sleep Med Rev 2002; 6:97-111.
5. Sanchez-Ortuno MM, Edinger JD. Cognitive-behavioral therapy for management of insomnia comorbid with mental disorders. Curr Psychiatry Rep 2012; 14(5): 519-28.
6. Peterson MJ, Benca RM. Sleep in mood disorders. Psych Clin North America 2006:29: 1009-32.
7. Bonnet MH, Arand DL. Hyprarousal and insomnia. State of science. Sleep Med Review 2010; 14:9-15.
8. Speilman AJ, Nunes J, Glovinsky PB. Insomnia. Neurol Clin. 1996; 14(3): 513-43.
9. Westermeyer J, Khawaja IS, Freerks M, Sutherland RJ, Engel K, Johnson D et al, Quality of sleep in patients with posttraumatic stress disorder. Psychiatry (Edgemont). 2010; 7(9):21-27
10. Khawaja IS, Hurwitz TH, Ebrahim A. Sleep Hygiene helps patients get some zzzs. Current Psychiatry 2007; 6(8):102
11. Khawaja IS, Dieperink M, Thuras P et al. Effects of sleep skills education on sleep quality in patients attending a psychiatry partial hospitalization program. Prim Care Companion CNS Disord 2013; 15(1). Pii. PCC.12m01440. doi:10.4088/PCC.12m01440.Epub 2013 Feb 14.
12. Morgenthaler T, Kramer M, Alessi C, et al. American Academy of Sleep Medicine. Practice Parameters for the psychological and behavioral treatments of insomnia: an update. An American Academy of Sleep Medicine report. Sleep 2006; 29(11):1415-9.
13. Bootzin RR, Perlis RR. Non pharmacological treatments of insomnia. J Clin Psychiatry 1992; 53 (suppl):37-41.
14. Roth T. Prevalence, associated risks and treatment pattern of insomnia. J Clin Psychiatry 2005:66 suppl 9: 10.
15. van den Heuvel CJ, Lushington K. Chronobiology and insomnia patho9physiology and treatment of circadian rhythm sleep disorders. Expert Rev Neurolther. 2002; 2(2):249-60.
16. Buyssee. Insomnia. JAMA 2013; 309(7):706-716.
17. Pagel JF, Parnes BL. Medications for the treatment of sleep disorders: An overview. Prim Care Companion J Clin Psychiatry. 2001; 3(3):118-125.
18. Morin CM, Valieres A, Guay B, et al. Cognitive behavioral therapy, singly and combined with medication for persistent insomnia: a randomized controlled trial. JAMA 2009; 301 2005-15.
19. Hauri PJ. Can we mix behavioral therapy with hypnotics when treating insomniacs? Sleep 1997; 20:1111-1119.
20. Sarris, J. and G.J. Byrne, A systematic review of insomnia and complementary medicine. Sleep Med Rev, 2011. 15(2): p. 99-106.