Family doctor concerns toward insomnia, assessment and management: Review

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Abstract

In this review we discuss family doctor concerns toward insomnia, focusing on its assessment and management. We conducted computerized search among electronic databases; EMBASE, COCHRANE, PUBMED and MEDLINE for literature available in the databases to September, 2017. Insomnia is a disorder characterized by inability to sleep or a total lack of sleep, prevalence of which ranges from 10 to 15% among the general population with increased rates seen among older ages, female gender, white population and presence of medical or psychiatric illness. Several tests exist for assessment of insomnia. Non-pharmacologic therapies such as stimulus control therapy and relaxation and cognitive therapies have the best effect sizes followed by sleep restriction, paradoxical intention and sleep hygiene education which have modest to less than modest effect sizes. Among pharmacotherapeutic agents, non-benzodiazepine hypnotics are the first line of management followed by benzodiazepines, amitryptiline and antihistaminics.

Introduction

The word "insomnia' originates from the Latin "in" (no) and "somnus" (sleep). It is a disorder characterized by inability to sleep or a total lack of sleep. Being the first psychosomatic disorder to be described by Johann Heinroth in 1818, insomnia clinically presents as a subjective perception of dissatisfaction with the amount and/or quality of the sleep [1]. The

presenting complaints are often that of difficulties falling asleep in spite of being in bed, waking up often during the night and having trouble going back to sleep, waking up too early in the morning or having an unrefreshing sleep [2].

Insomnia is one of the common but neglected conditions seen in family practice with long term and serious effects on health of a patient. Family physicians have the responsibility of diagnosing and adequately treating this [3].

Various studies have noted insomnia to be quite a common condition with symptoms present in about 33–50% of the adult population [4]. The prevalence, however, ranges from 10 to 15% among the general population [5] with higher rates seen among divorced, separated, or widowed people, [6] older ages, female gender, [7] White population, [8] and in the presence of co-morbid medical or psychiatric illness [9]. About 30% of all adults complain of occasional insomnia and 10% of chronic insomnia, of whom 40% may have a psychiatric illness [10] [11]. Despite these high prevalence rates, evidence suggests that insomnia is mostly under-recognized, under-diagnosed, and under-treated, with the condition continuing to remain persistent in 50–85% of individuals over follow-up intervals of one to several years [12].

The consequences of insomnia are significant, such as depression, impaired work performance, work- related/motor vehicle accidents, and overall poor quality of life. It is an easy-to-diagnose condition with many self-answerable questionnaires for aid, yet goes unrecognized in a significant number of patients coming to the outpatient department with other comorbid conditions [13].

Methodology:

We performed a comprehensive search using electronic databases; MEDLINE, EMBASE, and google scholar, through October, 2017. Search strategies used following MeSH terms in

searching via these databases: “insomnia”, “primary care”, “family doctors”, “management”, “treatment”. Then we also searched the bibliographies of included studies for further relevant references to our review. Restriction to only English published study with human subject.

Discussion

Classification

Insomnia can be classified as acute and chronic/primary and secondary. When insomnia lasts for 4 weeks or more, it is classified as chronic insomnia [14]. It is further subclassified into with or without comorbidities (medical and psychiatric) and associated with another primary sleep disorder [15].

Causes

Several risk factors for insomnia have been identified. Female sex, advanced age, depressed mood, snoring, low levels of physical activity, comorbid medical conditions, nocturnal micturation, regular hypnotic use, onset of menses, previous insomnia complaints, and high level of perceived stress have all been implicated as risk factors; the first three factors in particular, female sex, advanced age, and depressed mood, are consistent risk factors [16].

DSM-5 criteria

The DSM-5 criteria for insomnia include the followings [17]:

Predominant complaint of dissatisfaction with sleep quantity or quality, associated with one (or more) of the following symptoms:

- Difficulty initiating sleep. (In children, this may manifest as difficulty initiating sleep without caregiver intervention.)
- Difficulty maintaining sleep, characterized by frequent awakenings or problems returning to sleep after awakenings. (In children, this may manifest as difficulty returning to sleep without caregiver intervention.)
- Early-morning awakening with inability to return to sleep.

In addition:

- The sleep disturbance causes clinically significant distress or impairment in social, occupational, educational, academic, behavioral, or other important areas of functioning.
- The sleep difficulty occurs at least 3 nights per week.
- The sleep difficulty is present for at least 3 months.
- The sleep difficulty occurs despite adequate opportunity for sleep.
- The insomnia is not better explained by and does not occur exclusively during the course of another sleep-wake disorder (e.g., narcolepsy, a breathing-related sleep disorder, a circadian rhythm sleep-wake disorder, a parasomnia).
- The insomnia is not attributable to the physiological effects of a substance (e.g., a drug of abuse, a medication).

- Coexisting mental disorders and medical conditions do not adequately explain the predominant complaint of insomnia [17].

Patterns

Symptoms of insomnia are the followings [18]:

- difficulty falling asleep, including difficulty finding a comfortable sleeping position
- waking during the night and being unable to return to sleep
- feeling unrefreshed upon waking
- daytime sleepiness, irritability or anxiety

Assessment

The mandatory assessment of insomnia includes.

Sleep history

Sleep history is the first step in evaluation of primary insomnia, which provides the clinician with a structured approach to a diagnosis. It requires a general description of the disorder, i.e., its duration, severity, variation, and daytime consequences [19].

Use of prescription drugs

Various prescription drugs may be responsible for chronic insomnia. Such a use should be asked for specifically and ruled out. The drugs may include anticonvulsants such as phenytoin and lamotrigine, beta-blockers like acebutolol, atenolol, metoprolol, oxprenolol, propranolol, and sotalol, antipsychotics like sulpiride, antidepressants such as Selective Serotonin

Reuptake Inhibitors (SSRIs) or Monoamine oxidase inhibitors (MAOIs) and non-steroidal anti-inflammatory drugs (NSAIDs) such as indomethacin, diclofenac, naproxen, and sulindac [20].

Sleep diary

A sleep diary helps in specifically estimating the severity of the problem, the night to night variability, and presence of maladaptive habits such as taking naps or spending excessive time in bed (more than 8 hours). Sleep diary also keeps track of compliance with behavioral interventions and response to treatment [21].

Sleep and psychological rating scale

Epworth Sleepiness Scale (ESS) rates the chance of dozing in the following situations which may be during sitting and reading, watching television, sitting inactively in a public place, being a passenger in a car for an hour without a break, during lying down to rest in the afternoon, sitting and talking to someone, sitting quietly after lunch without alcohol or while waiting at a traffic signal in a car.

The ESS is rated on a 4-point scale for each of the above factors based on the following scores:

- 0 – no chances of dozing;
- 1 – slight chances of dozing;
- 2 – moderate chances of dozing; and
- 3 – high chances of dozing.

A score of more than 16 indicates daytime somnolence, while a cutoff of 11 is often employed to indicate a possible disorder associated with excessive sleepiness [22].

Focused physical examination

A general physical examination may help assess certain organic pathologies such as chronic obstructive pulmonary diseases (COPD), asthma, or restless leg syndrome which may disturb sleep [22].

Blood test

Blood tests may help to rule out subtle manifestations of thyroid diseases, iron deficiency anemia, and vitamin B12 deficiency [22].

Polysomnography

It is considered the gold standard for measuring sleep. electroencephalogram (EEG), electrooculography (EOG), electromyography (EMG), electrocardiography (ECG), pulse oximetry, and air flow are used to reveal a variety of findings like periodic limb movement disorder, sleep apnea, and narcolepsy [23].

Actigraphy

Actigraphy measures physical activity with a portable device (usually including an accelerometer) worn on the wrist. Data recorded can be stored for weeks and then

downloaded into a computer. Sleep and wake time can be analyzed by analyzing the movement data. This approach to estimating sleep and wake time has been shown to correlate with polysomnographic measures in normal sleepers, with reduced values noted in patients with insomnia [24].

Mechanism

Two main models exists as to the mechanism of insomnia, (1) cognitive and (2) physiological. (Figure 1)

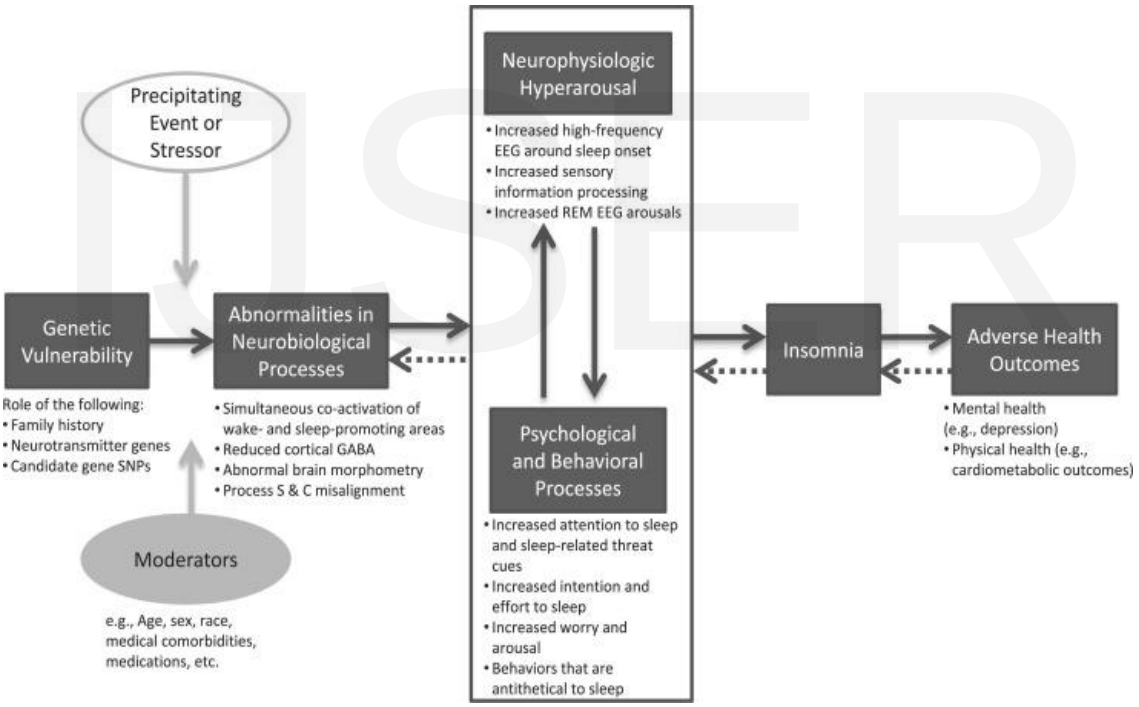

Figure 1: Pathophysiology of insomnia
Source: http://www.sciencedirect.com/science/article/pii/S0012369215389698

The cognitive model suggests rumination and hyperarousal contribute to preventing a person from falling asleep and might lead to an episode of insomnia [25].

The physiological model is based upon three major findings in people with insomnia; firstly, increased urinary cortisol and catecholamines have been found suggesting increased activity of the HPA axis and arousal; second increased global cerebral glucose utilization during wakefulness and NREM sleep in people with insomnia; and lastly increased full body metabolism and heart rate in those with insomnia. All these findings taken together suggest a dysregulation of the arousal system, cognitive system and HPA axis all contributing to insomnia [26]. However, it is unknown if the hyperarousal is a result of, or cause of insomnia. Altered levels of the inhibitory neurotransmitter GABA have been found, but the results have been inconsistent, and the implications of altered levels of such a ubiquitous neurotransmitter are unknown. Studies on whether insomnia is driven by circadian control over sleep or a wake dependent process have shown inconsistent results, but some literature suggests a dysregulation of the circadian rhythm based on core temperature [27]. Increased beta activity and decreased delta wave activity has been observed on electroencephalograms; however, the implication of this is unknown [28].

Therapy

The treatment of insomnia consists of initially diagnosing and treating the underlying medical or psychological problems. The identification of behaviors that may worsen insomnia follows and stopping (or reducing) them would help eliminate insomnia. Next, a possible trial of pharmacology can be tried, although the long-term use of drugs for insomnia is controversial. This is in spite of the fact that the US FDA has approved three medications for the treatment of insomnia with no limitation on the duration of their use. A trial of behavioral techniques to improve sleep, such as relaxation therapy, sleep restriction therapy, and reconditioning, is

however useful. Behavioral intervention combined with pharmacologic agents may be more effective than either approach alone [29].

PHARMACOLOGICAL THERAPY

First line drugs

Benzodiazepines

These hypnotics reduce latency to sleep onset and total awakenings by increasing total sleep duration. Benzodiazepines enhance the effect of the inhibitory neurotransmitter gamma-amino butyric acid (GABA) by increasing the affinity of GABA for its receptor. Benzodiazepines non-selectively bind to an allosteric site and affect the GABA-A receptor complex to allow a greater number of chloride ions to enter the cell when GABA interacts with the receptor and therefore enhance the inhibitory action of GABA. This accounts for their sedative, anxiolytic, myorelaxant, and anticonvulsant properties. Major side effects of short-acting benzodiazepines include rebound insomnia and anterograde amnesia. Intermediate-and longer-acting benzodiazepines are less effective for inducing sleep, but are indicated for sleep maintenance and decreasing nocturnal awakenings [30].

Zopicione

Zopiclone is a non-benzodiazepine hypnotic of the cyclopryrrolone class. It is effective for reducing sleep latency and nocturnal awakenings and increasing total sleep time. Zopiclone delays the onset of rapid eye movement (REM) sleep but does not reduce consistently the total duration of (REM) periods. Rebound effects have been reported but are minimal. The incidence of adverse effects is low at recommended doses (3.75–7.5 mg) [31].

Zolpidem

Zolpidem is a non-benzodiazepine hypnotic of the imidazopyridine class. It exhibits hypnotic effects with minimal myorelaxant, anticonvulsant, and anxiolytic properties, as it preferentially binds with the GABA-A receptor complexes with an alpha-1 subtype. Zolpidem is effective for reducing sleep latency and nocturnal awakenings and increasing total sleep time. Rebound effects are minimal. Common side effects include drowsiness, dizziness, and headache [32].

Zaleplon

Zaleplon, like zolpidem, belongs to the imidazopyridine class of non-benzodiazepine hypnotics. The pharmacology of these two drugs is similar; however, zaleplon has an ultra-brief duration of effect. It is effective for reducing time to sleep onset, but is not as effective for reducing nighttime awakenings or increasing total sleep time. No next-day sedation or rebound insomnia is documented with zaleplon at recommended doses (5–10 mg) [33].

Second line drugs

Antidepressants

Tricyclic antidepressants (TCAs) such as amitriptyline, doxepin, and nortriptyline are effective for inducing sleep and improving sleep continuity. These agents should be used at their lowest effective dose to minimize anticholinergic effects and to minimize cardiac conduction prolongation, especially in the elderly [34].

Trazodone

Trazodone is a potent sedating antidepressant. Trazodone improves sleep continuity and is an attractive option in persons prone to substance abuse, as addiction or tolerance is not a problem. Trazodone is also used in conjunction with stimulating antidepressants such as some SSRIs and bupropion in depressed patients with insomnia [35].

Antihistamines

These agents are effective for mild insomnia; however, next-day sedation may be a problem. Antihistamines commonly cause psychomotor impairment and anticholinergic effects. Tolerance may also develop with repeated use and evidence for their efficacy and safety is very limited [36].

NON-PHARMACOLOGICAL THERAPY

Non-pharmacologic interventions for insomnia consist primarily of short-term cognitive-behavioral therapies. These methods act primarily by reducing heightened autonomic and cognitive arousal, modifying self-perpetuating maladaptive sleep habits, altering dysfunctional beliefs and attitudes about sleep, and educating patients about healthier sleep practices. Non-pharmacological therapies include stimulus control therapy, sleep restriction, relaxation therapies, cognitive therapy, paradoxical intension, sleep hygiene education, and behavioral intervention [37].

Conclusion

The prevalence of chronic insomnia is quite high, yet remains under-diagnosed. It is imperative to recognize it since it may result in increased healthcare utilization, lower quality of life and social relationships, and decrements in memory, mood, and cognitive function. Management strategies favor a combination of cognitive/behavioral therapy and short-term pharmacotherapy with non-benzodiazepine hypnotics being the first line of management.

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