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Insomnia in elderly patients – various ways to manage

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Abstract

Introduction: Impaired duration, rhythm and depth of sleep and wakefulness called insomnia is a common problem in the group of geriatric patients. About 50% of elderly people report insomnia.

Material and Methods: The paper reviews literature using the EBSCO and Google Scholar databases. Articles have been analyzed using the keywords insomnia, elderly patients, prevalence and etiology, primary care, treatment, diet, physiotherapy. The article presents various methods to manage insomnia among the elderly.

Results: The main treatment for insomnia includes pharmacological and non-pharmacological interventions or a combination of both. A very important aspect is proper dietary, physiotherapy treatment and physical activity.

Conclusions: Effective management of sleep disorders improves the quality of life of patients struggling with this disorder and prevents the occurrence of depression and anxiety, which often coexist with insomnia.

Key words: insomnia, elderly patients, prevalence and etiology, primary care, treatment, diet, physiotherapy

Introduction

Insomnia defined as a disorder of the proper rhythm, duration and depth of sleep and wakefulness is a common problem among the elderly population. Difficulties in falling asleep often have a multifactorial etiology, associated with the occurrence of co-morbidities and patient's lifestyle practises. The problem of insomnia is often marginalized and undiagnosed among geriatric patients due to the perception of it as a natural consequence of the aging process of the organism [2, 3, 4].

However, there are reports which show the connection of insomnia with increased morbidity and mortality from heart attacks and strokes among patients suffering from insomnia [1, 2].

Geriatric insomnia causes a deterioration in the quality of life of patients, reduces their cognitive ability and concentration, gives slow reactions and worsens memory. These symptoms lead to an increase in the number of falls and fractures and lowering the pain threshold which is associated with an increased use of healthcare resources [1, 4].

Effective management of sleep disorders improves the quality of life of patients struggling with this disorder and counteract the occurrence of depression and anxiety which often coexist with insomnia [3].

Prevalence, etiology and risk factors

Sleep disorders are very common in older people. As many as 50% of elderly people report sleep disturbances consisting of difficulties in falling asleep, difficulties in maintaining sleep, waking up too early in the morning and feeling that sleep is not relaxing. In a study conducted among the general public, there were various insomnia: 32.2% in the metropolitan area of Los Angeles, 13.4% in the Republic of San Marino, 25% in Austria, 26.2% in Switzerland, 12% in Sweden and 11.7% among new ambulatory patients visiting general hospitals in Japan [5, 6].

Foley et al. (1999) reported that the annual incidence of insomnia is approximately 5% in older adults. The overall incidence of insomnia was similar in men and women but was higher among men 85 years and older. Twenty-three percent of elderly patients suffered from severe insomnia. Over 80% of patients reported suffering from insomnia for 1-5 years or more, which indicates a chronic course [6, 7, 11].

It is important to distinguish between sleep changes and sleep problems. In elderly patients, sleep is less efficient, defined as the ratio of sleep time to bed time. This is related to awakenings, which are a common problem. The time needed to fall asleep also increases. They have reduced fast-motion sleep (REM) and reduced sleep in the 3rd and 4th stages ("deep", slow-motion dream characterized by delta waves) [8, 9].

Chronic insomnia is often associated with somatic diseases, especially those in which pain occurs and diseases that lead to limitation of physical activity during the day, for example musculoskeletal disorders and neurological diseases. Spelman's (1987) factors that cause insomnia include stress factors, family and financial problems. Retirement, somatic diseases, neurological diseases, mental disorders. Bad sleep hygiene. Factors that overwhelm excessively long time spent in bed, limiting physical activity, excessive worrying due to

deterioration of sleep quality, sleeping for strength, permanent taking of sleeping pills [10, 12,13].

Primary care of patients with sleep disorder

Primary health care plays a major role in screening and managing sleep disorders since it will often be the first place the patient will report any sleep complaints [14].

Unfortunately due to insufficient training and shortage of time many primary care providers are ill-equipped to deal with insomnia and as a result it often remains undetected or neglected [14,15,16].

The main treatment of insomnia consist of pharmacological and non-pharmacological interventions or combination of both. Non-pharmacological interventions include behavioral modification and psychological therapies, such as sleep restriction, sleep hygiene education, stimulus control, relaxation training and cognitive behavioral therapy for insomnia – CBTI, which combines methods mentioned above. Pharmacological treatment includes sedatives or hypnotic drugs, such as benzodiazepines.

In general behavioral treatments are viewed as initial intervention, that needs to be implemented whenever possible. Pharmacological treatment should only be prescribed if necessary, and ought to complement psychological intervention. Hypnotic drugs should be used only as short-treatment, due to their risk of tolerance and adverse effects [17, 18].

In many countries CBTI is recommended as the first-line treatment in insomnia [17, 19]. Behavioral treatment has been proved to have the same effectiveness as hypnotic drugs [17, 20]. In addition pharmacological treatment is effective only when being taken and non-pharmacological interventions, such as CBTI can last up to 3 years of follow-up [20, 21]. In combined therapies CBTI has also been proved to reduce dosage of hypnotic drugs [17, 20].

Despite the fact that pharmacological intervention is not recommended as first-line treatment it still remains the main intervention administered by primary care providers [22, 23]. The second most common treatment option is education about sleep hygiene. It includes instructions such as avoiding alcohol and caffeine before sleep or minimizing noise in the bedroom, however it has been proved to be ineffective when implemented alone and should be used in combination with other behavioral treatments [17, 21].

The reason for such interventions is that primary care physicians often perceive sleep hygiene education and pharmacological treatment as the most available in place, since CBTI is often only conducted in specialty clinics [14, 16, 17]. Therefore recent studies are researching innovative methods like online CBTI programs, CBTI conducted by nurse-led groups or brief behavioral treatment for insomnia (BBTI) which all have also been proved effective [17, 21, 24].

Insomnia in elderly patients is a major public health concern and early recognition training and effective interventions should be implemented in fast-paced primary health care system to give more patients access to safe and successful treatment option.

Pharmacological methods of treatment

It is important to remember that pharmacotherapy's character in insomnia treatment is only adjunctive. The main role should always be played by psychological or behavioral therapies

[25]. When insomnia symptoms persist despite the proper therapy or the patient is unable to pursue it, medications should be considered.

Using this five basic principles can make insomnia pharmacotherapy safe and effective: use of the lowest effective dose, use of intermittent dosing (2 to 4 times weekly), short-term medication prescribing (regular use for not more than 3 to 4 weeks), gradual medication discontinuation (to reduce rebound insomnia) and using medications with shorter elimination half-lives (to minimize daytime sedation) [9].

Benzodiazepines (BZDs) improve insomnia by reducing REM sleep, decreasing sleep latency, and decreasing nocturnal awakenings. Although at the beginning of the therapy they are very effective in inducing and prolonging sleep, this group of drugs is not recommended for long-term therapy. Tolerance develops rapidly, rebound insomnia can occur within 1 or 2 weeks of use. BZDs may also cause addiction, daytime sedation and dizziness falls.

Non-benzodiazepine drugs, like zolpidem and zaleplon have an advantage over BZDs in several respects. Their shorter half-lives may contribute to the reduced next-day residual effect. This medicaments can also be safer in certain patient populations, for example, those at risk for respiratory depression, but more research are needed to confirm this [7]. There also is a lower risk of drug-drug interactions, which is unquestionable important in population of geriatric patients. Zolpidem and zaleplon improve sleep onset, but not sleep maintenance.

Ramelteon is a melatonin agonist. Based on randomized trials it may improve sleep onset in patients with insomnia, but the effect is relatively small and can be not clinically significant [26]. This drug is approved in the USA and Japan, but the European Medicines Agency did not approved Ramelteon for use in insomnia.

Orexin receptor antagonists are a novel class of drugs in development for the treatment of insomnia. The role of this groups of medications remains to be determined, they have not yet been compared directly with other therapies for this problem [27].

Influence of physiotherapy and physical activity on sleeplessness

Insomnia is a complex disease entity. Very often the cause of sleeplessness can coexist with other disease that patient suffers from. An example of such a disorder may be chronic lower back pain (CLBP). Sleep disorders are one of the most common complications that occur with CLBP. Scientific reports emphasize the essence of understanding the nature and extent of sleep disorders in CLBP. Non-pharmacological methods of treatment of insomnia should be an integral part of the management of CLBP, not neglected by medical staff, who is engaged in comprehensive treatment of patients [28].

Insomnia can be treated both pharmacologically and non-pharmacologically. The latter form of treatment includes physical activity and in the broad sense physiotherapy. Often, physical activity in the treatment of insomnia is simply part of physiotherapy. It may be a form of non-pharmacological treatment of sleep disorders, especially in the elderly. Among the physical activities may be distinguished gentle physical exercises and more intense ones. In the scientific literature it is emphasized that acute physical exercise causes a temporary reduction in sleepiness depending on the time of day and intensity of exercise. This reduced drowsiness

is often caused by exercise, because it increases total sleep time, delays REM sleep, prolongs sleep time 4, and also shortens REM sleep time [29, 30].

On the other hand, instead of intense exercise, insomnia can be treated with more peaceful exercises. Research conducted by Hartescu et al. on 41 people in the UK in 2015 showed that moderate physical activity reduces the symptoms of insomnia and significantly increases the mood. Participants of the study were asked to perform a quick walk in the place and time they chose. Exercises were to be carried out for a period of 4 weeks, for at least 30 minutes a day and at least 5 days a week, for a total of at least 150 minutes a week. Results allowed to observe a statistically significant improvement in sleep and mood indicators. Importantly, these results were not independent of the average daily exposure to light, as well as the health and social status of the participants [30].

Another method of physiotherapeutic treatment in insomnia can be massage. The use of massage is common with insomnia accompanying the postmenopausal period in women [31]. Research conducted by Oliveira et. al in Brazil in 2011 and 2012 showed that massage could cause an improvement in sleep patterns [32, 33]. By polysomnography, a significant decrease in REM latency and sleep stage 1, and also an increase in sleep stage 3 and 4 was observed. The conclusion is that massage indicates an improvement in sleep quality and improvement of climacteric or perimenopausal symptoms [31, 32, 33].

Insomnia is also treated using yoga. Studies conducted also in Brazil in 2011 by Afonso et al. on 44 postmenopausal women emphasize the improvement of sleep quality as a result of yoga exercise for 4 months. In addition, the authors of the study obtained higher scores for quality of life and also resistance phase of stress. Moreover, the reduction in insomnia severity in the yoga group was significantly higher compared to the control or passive-stretching groups [34].

To sum up, participation in exercises has a moderately beneficial effect on sleep quality. It decreases not only sleep latency, but also use of sleep medication. Physical exercise therapy might be an alternative or complementary approach to existing therapies for insomnia, especially because of the fact, that exercises are not expensive, widely available and generally safe for everyone [35].

Influence of diet on quality of sleep

People should pay attention to their sleeping quality because it influences their daytime routine. Many studies confirm that diet has influence on sleeping. Nutrition has effects on duration, efficiency and architecture of sleep. Ingredients contained in food like fat, protein and carbohydrate have a great impact on falling asleep. What's more, specific products have proved influence on sleeping because of molecules contained in it [40].

First of all a high consumption of sweets and noodles provided to low sleep indexes, whereas a diet combined of fish and vegetables was connected with a good sleeping [36]. The research showed that quality of carbohydrates is more important than quantity of them. Also, low intake of carbohydrates has proven influence on problems during sleep [37].

It is also known that proteins are important for sleeping habits [38]. Low protein consumption (<16% of energy) was connected with a lower quality of sleeping while high protein intake was combined with problems of remaining asleep.

Comparison of high-carbohydrate and high-fat meal before sleeping has some interesting conclusions [39]. SWS (slow wave sleep) decreased after the first cycle of sleep after high carbohydrate meal comparing to high fat meal. Moreover, sleep architecture didn't change after both interventions during all the time of sleeping.

Different individual macronutrients in food products were adapted to observe the effect on adults' sleep [40]. Three types of diets were used : high-protein, high-carbohydrate, high-fat and control diet. Wake episodes and SOL were observed what indicated a significant meaning of diet. The application of the high-protein diet reduced the number of wake episodes compared with the control diet. Observations of SOL proved a more meaningful reduction after the HC diet than after the control diet.

It is proven that fatty fish (>5% of fat) has influence on sleeping [41]. This product is a rich source of vitamin D and omega-3FAs. That is important for regulation of serotonin and therefore for sleeping regulation. Intervention showed that those who consumed fish comparing to those who consumed the same portions of meat, had higher concentrations of vitamin D and omega – 3FAs. It was correlated with improved sleeping quality.

The influence of tart cherries on sleeping is very curious [42]. Consumption in the mornings and before going to bed had a meaningful effect on reducing insomnia and WASO for those who suffered from chronic insomnia among adults. Cherries have a high concentration of melatonin, TST and SE compared to placebo juice [43]. Those ingredients take essential part in sleeping regulation.

Discussion

The subject of insomnia in geriatric patients has been undertaken for many years by many authors, but in most cases it was not treated interdisciplinary. Sonia Ancoli Israel and others, in their comparative studies lasting two weeks, found Zeleplone better performance compared to Zolpidem. There was also a lack of side effects when using Zaleplon in elderly patients, especially in the central nervous system. The effective dose of Zeleplone in the insomnia problem was 10g, the 5g dose had worse effects [44].

Katie Stone and others in their article draw attention to the relationship between the use of pharmacological treatment in sleep problems in geriatric patients and their occurrence of side effects, such as increased risk of falls, which in many cases causes fractures or other serious injuries [45]. Doong Yoon Kang also comes to similar conclusions, in his research, conducted on nearly 6,000 patients, the correlation between benzodiazepines and the risk of bone fractures was detected. There was also an increased emphasis on the education of geriatric patients, which would aim at reducing the amount of pharmacological agents prescribed to patients, and thus limiting side effects [46].

Scharf et al. Investigating the effect of Eposziklone on insomnia in elderly patients found better efficacy at the 2g dose compared to the 1g dose. Noticeable were, among others, much shorter and shorter naps during the day; and significantly higher assessments of the quality and depth of sleep, daytime alertness and a sense of physical well-being compared to the placebo group. They did not show current side effects, patients complained only about the unpleasant taste of the drug [47].

Lemoine points to the significant and long-lasting effectiveness of treatment in patients with primary insomnia treated with antihypertensive drugs. treatment seems to be safe in case of insomnia in patients with co-existing cardiovascular diseases [48].

According to Bloom's and other's research, recommendations have been put forward that, among other things, refer to an In-depth medical history of sleep-related ailments, which is necessary to determine the causes and consequences of insomnia. Physical examination is an important element in the assessment of patients reporting insomnia and other somatic complaints. Non-benzodiazepine drugs and melatonin receptor agonists are currently the safest and the most effective hypnotics available. Cognitive behavioral insomnia therapy (CBT-I) is an effective method in the treatment of insomnia in elderly patients The use of antihistamines, antidepressants, antiepileptics and antipsychotics is associated with a greater risk than the benefits of insomnia treatment, especially in the elderly, all FDA approved drugs for the treatment of insomnia can cause clinically significant side effects [49].
According to Bidzan, a number of diseases, including psychiatric ones, and the acceptance of many drugs and other chemical substances are among the important factors influencing sleep. The most common psychiatric disorders that cause sleep disorders include depression and dementia. The correlation between cognitive functions and sleep disorders is particularly evident. It is also proposed that sleeping pills should only be reached when, despite causative treatment, insomnia persists and significantly affects the functioning of the patient and treatment with sleeping pills should not last longer than a few weeks [50].

Conclusions

Insomnia is an underrated but important problem in elderly people. It can have a great impact on health, even increasing the numbers of strokes and fractures. It often coexists with depression and may significantly reduce the quality of life. Half of the elderly have problems with sleeping, more older man than women, but the difference is little. It is physiological that in the process of aging the sleep is less effective due to reduced REM, third and fourth phase and more awakenings but chronic insomnia should not be ignored.

It can be a symptom of somatic disease, severe or dull pains, psychological, neurological problems or just bad sleeping habits. Taking care of patient with insomnia is an underestimated issue, but there are many ways to change it. Sometimes the modifications in patient’s lifestyle are enough. Education plays an important role as elderly people tend to neglect their health. Psychological and behavioral help is the basic of insomnia treatment and should always be considered.

Pharmacological intervention is very effective but it may also have serious side effects so it should be given when the other ways of treatment do not reduce the problem. Benzodiazepines are commonly prescribed in sleeping disorders as they have tranquilizing function and increase duration of sleep, although they may cause addiction and rebound effect. Newer drugs such as zolpidem seem to be more safe, but there is a need for more research.

Physiotherapy and physical activity are very promising in many insomnia cases, for example in those patients with chronic lower back pain. Moderate exercises such like a long walk or yoga can be calming and stable the mood when done regularly. Massage is proven to be helpful, especially in postmenopausal women. These methods seem to be a useful and safe addition to psychological and pharmacotherapy.

What is interesting is that diet also has influence on sleeping. Too many or too little carbohydrates, proteins and fats can negatively affect sleep efficiency. Fatty fish and vegetables, which are valid sources of necessary fatty acids and vitamins, are proven to increase the quality of sleep. Also, cherries can regulate sleep as they contain melatonin.

As presented in the article, there are various methods to manage insomnia among the elderly. It can be caused by complicated life situation or be a signal of dangerous disease so it is always important to investigate it. Sometimes talk with the specialist is enough, but there are cases when medication is recommended. Daily routine, sleeping habits, physical activity and diet have an enormous impact on sleeping, but it should be further examined to deepen the knowledge of this subject.

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