

Research on the Insomnia Drugs and Comparison

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Abstract. Insomnia has become very common now due to the increasing work pressure. Nowadays, people often work overtime until midnight or engage in jobs where day and night are often reversed. The emergence of this new working model is also one of the reasons why insomnia has become common. Insomnia has many disadvantages. Short-term insomnia can cause patients to have poor concentration the next day and feel weak. Long-term insomnia will lead to an increase in cardiovascular and cerebrovascular diseases, and it will also weaken the resistance and increase the patient's risk of disease. This article will mainly compare several common drugs for treating insomnia to analyze which drug is more competitive. During the comparison process, the author will compare advantages, prices, side effects, applicable groups, etc. The result of the comparison is to compare the two drugs in sequence and choose the one with more advantages. The author draws conclusions by reviewing a large amount of information.

Keywords: Daridorexant, insomnia, insomnia drug.

1. Introduction

Insomnia is becoming increasingly common in contemporary society. However, scientists have long been concerned about the side effects and effects of sleeping pills. Therefore, it is time to develop a new drug to treat insomnia. New drugs can be comprehensive upgrades to old drugs, or new drugs can be supplements to old drugs. This article will cover 5 drugs: daridorexant, Temazepam, Suvorexant, Trazodone, and Ambien. Daridorexant is a new drug launched last year to treat insomnia. It has fewer side effects than other drugs and has a very specific mechanism of action. Clinically, daridorexant showed no drug residue the next morning and was considered safe to use. Temazepam is a benzodiazepine drug. It can slow down the speed of the central nervous system to helping patients to fall asleep. The drug Suvorexant is orexin inhibitors. It achieves therapeutic effects by blocking OX1R and OX2R. Trazodone is a serotonin antagonist reuptake inhibitor. This drug allows serotonin to stay in the brain for longer. Ambien is a prescription drug for short-term insomnia that works best for people who have trouble initiating and maintaining sleep. This article will compare the advantages or disadvantages of these five drugs, mainly starting from the side effects of the drugs, so as to determine which drug has the most advantages.

Trazodone vs. Ambien: How are They Similar and How are They Different? This article was written by Joseph Ranieris. This article mainly introduces two drugs, Trazodone and Ambien. The article describes the side effects of two drugs. There are also some symptoms that may occur after taking the medicine. The article talks about symptoms for children and adults respectively. Temazepam: Uses, Dosage & Side Effects This article was written by Sinha, Sanjai. The article mainly introduces the drug Temazepam, and then introduces the negative effects of this drug and the precautions for taking this drug. The price and dosage of the drug are also spelled out. Quviviq Vs Belsomra (Daridorexant Vs Suvorexant) This article was written by Ahmed D. This article explains the two drugs Daridorexant and Suvorexant. This article makes a detailed comparison of these two drugs. The article first introduces the basic information of the two drugs, including the manufacturer, price, and reasonable dosage. The article then explains the probability of side effects of the two drugs, and finally the article explains the respective advantages of the two drugs. Restoril vs. Ambien: Differences, similarities, and which is better for you was written by Kristi Torres. This article mainly introduces the two drugs Restoril and Ambien. At the beginning of the article, the author introduces the efficacy of two drugs. These two drugs achieve therapeutic effects through different ingredients. Then he introduces the basic information of these two drugs in detail. After that, the article discusses

prices, side effects, and warnings. To explain which drug is more effective. Trazodone and Ambien: What are the Similarities and Differences was said by Dodge. At the beginning, the article first introduced what Trazodone and Ambien are. The following article discusses Sleep-Aids and Downsides. The article then talked about the side effects of the two drugs and compared them.

2. Methods

2.1. Data Source

The resources for this article were mainly found from the website, and the conclusions were drawn by searching for relevant information on five drugs and comparing them. These articles were partially obtained from Google Scholar and Google. These articles are all academic articles, and the authors have been reviewed at least several times. The tables in this article were created by the author himself. The author gathered important information and then created a table to show how the two drugs are similar and different. All specific numbers mentioned in the article are quoted from the article.

2.2. Method introduction

The entire article mainly adopts the method of literature search. The author first searched in Wikipedia for several diseases that are currently plaguing the public, such as heart disease, cancer, and neurological diseases. Among them, because people are generally more stressed now than before, insomnia has become a common problem. A problem that needs to be solved now. I read many papers on insomnia on Google, Google Scholar and Pubmed, and gradually learned about some more effective treatment methods. One of them achieves therapeutic effects by blocking OX1R and OX2R or through a serotonin antagonist reuptake inhibitor. These methods correspond to different drugs, and these drugs can alleviate insomnia to some extent. The author will then use these treatment methods to search for corresponding drugs. First, he searched for approved drugs for the treatment of insomnia on the FDA and found that there are more than thirty kinds in total. Then the author studied each drug through the FDA website. The author will record the side effects, price, ingredients, and efficacy of each drug. Then, using the information obtained, the author will compare the characteristics of different drugs to select the best drug for treating insomnia.

3. Results and Discussion

3.1. Insomnia

Insomnia is not only a common sleep disorder but a serious public health issue. It is characterized by difficulty falling asleep (prolonged sleep latency > 30 minutes), inability to maintain sleep and early awakening without the ability to fall asleep again, occurring at least three times a week and lasting more than 3 months with mental and/or physical dysfunction. Among the disease, more than three months is defined as chronic insomnia, while less than three months is acute insomnia. According to the predominant characteristic, insomnia is frequently divided into two subtypes: sleep initiation and sleep maintenance. In addition, insomnia is easy to run a chronic course and recur after treatments, may owing to diverse influencing factors from psychology and physiology. Patients with insomnia exist across all age groups. The prevalence of children aged 6 months to 5 years old is about 30%, and about 27% of children aged 5 to 12 years old have difficulty falling asleep.

Insomnia can be divided into primary insomnia and secondary insomnia. The pathogenesis of former is cloudy, but the latter typically results from emotional difficulties, persistent physical pain, hormonal issues, and drug side effects. In the process of exploring the cause, researchers have looked for plenty of methods. They formulated models based on psychophysiological and behavioral constructs and the “hyperarousal” model achieved consensus, which is explained by cognitive and physiological models. According to the cognitive model, stress from daily living disrupts sleep, leading to acute periods of insomnia, especially when trying to fall asleep and getting back to sleep

after waking up. The Spielman's "3-P" model is one of the most referenced concepts among psychological behavioral models that describes the development of insomnia from acute to chronic with the assistance of three intricately interconnected factors—predisposing, precipitating, and sustaining factors. Predisposing variables are the genetic, physical, and psychological risk factors that could make a person more susceptible to developing insomnia. The physiological, psychological, and environmental stressors that may cause the acute beginning of sleep disruption are precipitating factors. The term "perpetuating factors" refers to the false beliefs that people with insomnia have about sleep and insomnia, as well as the harmful coping mechanisms they frequently use to deal with their sleep issues but which unintentionally make them worse.

3.2. Daridorexant

Quviviq is a prescription drug that is taken by mouth, better known as Deradoorian, to treat insomnia. It is a dual orexin receptor antagonist. It can block the orexin receptors OX1R and OX2R, so that patients can be treated. The drug is now proven to be effective in adults, but its effectiveness in children is unknown. For those who have trouble falling asleep or staying asleep, this drug can be very effective. This drug needs to be taken once a night in a dose of between 25 mg and 50 mg. If you want to achieve the best effect, it is best to take it orally 30 minutes before going to bed. At the same time, the user must ensure that the sleep time is more than 7 hours. If the sleep time is less than this interval, the side effects will be obvious.

The drug also has some side effects, such as next-day headaches, drowsiness, and complicated sleep behavior. Since the drug is approved in 2022, its long-term side effects haven't had a chance to be studied. In a group of experiments involving 1,232 patients, when compared with the placebo group, for patients taking this drug, the probability of headaches was 6%-7%, and drowsiness or the probability of fatigue is 5%-6%, and the probability of dizziness is 2% to 3%. These occurred more frequently than in the placebo group. At the same time, some patients have greatly affected their motor coordination and alertness after getting up the next day, which will increase their risk when they are engaged in certain special projects. In long-term studies, when patients stopped taking the drug, they did not become dependent on the drug [1].

3.3. Temazepam

Temazepam is a benzodiazepine drug. This drug can affect people with insomnia by changing the chemicals in the body's brain. The core mechanism of this drug is to slow down the speed of the central nervous system of the human body, thereby making the human body drowsy and helping patients to fall asleep. The drug can be targeted therapeutically by binding to gamma-aminobutyric acid-A (GABA-A) receptors. This medication may be used to treat insomnia. This drug is also an oral drug and needs to be taken at bedtime, between 7.5 and 30 mg orally once. The main recommended treatment cycle for this drug is 7 to 10 days. This drug causes fast falling asleep after taking it.

The side effects of the drug are significant, with the drug potentially stopping or weakening the patient's breathing, especially if the patient has recently used opioids. Pregnant women are prohibited from taking this drug because it can cause birth defects in their newborns. At the same time, patients need to ensure at least 7-8 hours of sleep before taking this drug. This is to avoid a big impact on the next day. Other side effects of this drug include drowsiness, headache, fatigue, and lethargy [2].

3.4. Suvorexant

The drug Suvorexant is very similar to Deradoorian. They are both orexin inhibitors. They all achieve therapeutic effects by blocking OX1R and OX2R. They can be taken at 10 mg per day. This drug also requires at least 7 hours of sleep before taking it. The drug was developed by the German company Merck. This drug, like Deradoorian, is metabolized by the liver enzyme CYP3A4 and is mainly excreted in feces and urine. This drug is less suitable for use in children. If overused, it can lead to dependence on the drug. Patients take it once a day, thirty minutes before going to bed.

This drug has many side effects. Examples include weakness in the legs, anxiety, depression, memory problems, daytime sleepiness, and strange dreams at night. The probability of these symptoms is higher than that of daridorexant [3].

3.5. Trazodone

Trazodone is primarily used to treat major depressive disorder. It is a serotonin antagonist reuptake inhibitor. This drug allows serotonin to stay in the brain for longer. Serotonin is the hormone that makes people feel happy, so it can be used to treat depression. This drug is mainly used to treat insomnia caused by depression. This drug can also treat insomnia while improving depression. This drug is not approved for use in children. For those who are allergic to Trazodone, it must not be used. This drug is given at 150 mg orally per day, and thereafter, the dose can be increased by 50 mg orally per day every 3 to 4 days. It takes an average of 2 weeks to achieve the best results.

There are some side effects of this drug. This drug may cause hives, breathing difficulties, and swelling in some areas, prolonged and painful erections, fatigue, inability to concentrate, and abnormal heart rhythm. At the same time, this drug may cause patients to suffer from serotonin syndrome [4].

3.6. Ambien

Ambien is a prescription drug for short-term insomnia that works best for people who have trouble initiating and maintaining sleep, but it's not the same as Restoril. This drug has a greater affinity for omega-1 of the GABA-A receptor. This drug promotes sleep by increasing GABA levels. Because GABA slows down brain activity. This medicine is composed of Oral immediate and extended-release tablets. This drug should be taken every day, 5-10 grams each time, and the insomnia must be maintained for at least 7 hours. Ambien does not recommend long-term treatment. This means that the treatment cannot exceed 10 days.

Side effects of this drug include drowsiness, severe allergic reaction, daytime sleepiness, poor memory, reaction time difference, poor coordination, and hallucination. This drug can cause drug dependence [5].

3.7. Comparison Results

It can be known from Table 1. In terms of price, the price of Daridorexant is \$17.6/per piece, and the price of Suvorexant is \$15.17/per piece. Daridorexant is slightly more expensive than Suvorexant. The half-life of Daridorexant is 8 hours. The half-life of Suvorexant is 12 hours. Daridorexant has a shorter half-life, which means that when the patient wakes up the next day, he will have fewer symptoms. For these two drugs have different side effects, Daridorexant has less chance to have the symptoms of Headache, Fatigue and sleepiness, and Dizziness when the patient wakes up the next day. For Sleep maintenance, Daridorexant has a better effect than the control group [6]. Daridorexant is more effective than Suvorexant.

Table 1. Daridorexant vs Suvorexant

	Daridorexant	Suvorexant
price	\$17.6/per piece	\$15.17/per piece
Half-life	8 hours	12 hours
Side effect	Headache: 6-7% Fatigue and sleepiness: 5-6% Dizziness: 2-3%	Headache: 7% Fatigue and sleepiness: 7% Dizziness: 3%
Sleep maintenance	2 times higher than placebo	1.5 times higher than placebo

From Table 2, for chronic insomnia, patients taking Ambien can be treated, but patients taking Temazepam cannot be treated. In terms of side effects, for Ambien, the probability of patients waking up with Drowsiness the next day was 8%, and no Headache, Fatigue, or Nervousness was found. For patients taking Temazepam, the probability of Drowsiness is 9.1%, the probability of Headache is

8.5%, the probability of Fatigue is 4.8%, and the probability of Nervousness is 4.6% [7]. Apparently, the Ambien treatment works better.

Table 2. Ambien vs Temazepam

	Ambien	Temazepam
chronic insomnia	yes	no
Side effect	Drowsiness: 8% Headache: Not defined Fatigue: Not defined Nervousness: Not defined	Drowsiness: 9.1% Headache: 8.5% Fatigue: 4.8% Nervousness: 4.6%

According to Table 3, patients taking Trazodone may cause serotonin syndrome, but Ambien will not cause this disease [8]. Patients taking Trazodone may have nearly 20 side effects such as Vomit, constipate, anxiety, can't concentrate, loss of appetite. But patients only had about 10 side effects after taking Ambien. Ambien is better than Trazodone [9].

Table 3. Trazodone vs Ambien

	Trazodone	Ambien
Cause serotonin syndrome	yes	no
Side effect	Vomit constipate anxiety can't concentrate loss of appetite	lethargy drowsiness Dizziness

According to table 4, for patients taking Ambien or Daridorexant, it is difficult to tell which drug is better from the results. Neither drug was overwhelming. Ambien focuses more on the treatment of both short-term and longer-term (chronic) insomnia, and can also help patients fall asleep faster. Daridorexant focuses more on keeping people asleep, and there are sleep onset, sleep maintenance and total sleep time improvement. Both drugs cause a similar number of side-effects [10].

Table 4. Ambien vs Daridorexant

	Ambien	Daridorexant
Advantage	short-acting get to sleep both short-term and longer-term (chronic) insomnia	get to sleep and stay asleep sleep onset, sleep maintenance and total sleep time improvement
Side effect	feel drowsy worsen next-day alertness and motor coordination	headache and dizziness, sleepiness, grogginess

4. Conclusion

In conclusion, this article is a comparative paper, the comparison is to illustrate which drug selection is the most effective. The data or information cited in this article are academic. The entire article starts with an introduction to the structure of the article, and then the article presents what insomnia is, and gives how to define insomnia and the harm of insomnia to these patients. After that, the article introduces five drugs for treating insomnia, namely Daridorexant, Suvorexant, Ambien, Temazepam and Trazodone. The article first introduces the treatment methods, side effects, prices, and trial groups of each drug separately. The author then compared each of the two drugs to select the best drug. Daridorexant is more effective than Suvorexant. The Ambien treatment works better than Temazepam. Ambien is better than Trazodone. Ambien or Daridorexant have the same results. Across the analysis, the two drugs, Ambien or Daridorexant, were more effective than the other three drugs. In the future, when patients with insomnia symptoms have difficulty choosing medications, they can read my article to understand what insomnia is and which more effective medication they

should use. In this way, these patients can receive more effective treatment and readjust to their normal lives more quickly.

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