

The effect of sleep on the human body

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Abstract. The article aims to investigate the effect of sleep on the human body, taking into account the physical and psycho-emotional state, depending on the duration of adequate sleep and in case of its lack. To study the characteristic features of the phases of REM and slow sleep, to see how they affect the quality of work and mental activity. The article also pays special attention to the causes that disturb sleep and how to eliminate them.

Keywords: sleep, insomnia, bruxism, pathogenesis, sleep phases, sleep disturbances, causes, elimination of causes, melatonin, collagen.

Introduction

For the normal life of a person, high-quality and full sleep is necessary, because it is a form of passive rest of the body. During sleep, the human body not only rests, but also produces hormones useful to the body, and one of them is melatonin, which in turn regulates the activity of the endocrine system, blood pressure, slows down the aging process, enhances the efficiency of the immune system, has antioxidant properties, and important in the physical and psychological health of a person, as it helps to control our mood throughout the day. In a dream, another hormone is produced - growth hormone, or somatotropin, which helps to increase muscle mass and reduce body fat.

Sleep is a natural physiological process of being in a state with a minimum level of brain activity and a reduced response to the world around us. Healthy sleep is a prerequisite for a good mood and well-being.

Healthy sleep is scientifically considered to be the key to success in your career, school and life. Sleep is 1/3 of a person's entire life, and if a person suffers from insomnia or does not sleep for a long time, he may die.

The effect of sleep on the human body

Sleep is a complete immersion in the subconscious of the body, it provides rest for the body, facilitates the processing and storage of information, facilitates the consolidation of the studied material and implements subconscious models of expected events. Sleep compensates for the damage caused to the body during the period of life. In a dream, biological processes occur, without which human life would be unbearable. A person feels rested, full of energy after sleep, his cells produce more protein, harmful toxins are eliminated, and blood is evenly distributed throughout the body during sleep.

A good sleep also plays an important role in the appearance of a person. Collagen is produced at night, which improves the firmness and elasticity of the skin. Dermatologists claim that every hour of sleep affects the regeneration of the epidermis. For example, if you sleep only 5 hours a day, then soon you will have twice as many wrinkles as a person with 7 hours of sleep. In addition, if you do not get enough sleep, your skin is dehydrated, which makes wrinkles more noticeable.

Sleep also affects the immune system. One of the building blocks of the immune system is proper sleep, and if you don't get enough sleep one night, your brain loses some of its tissue. With a lack of sleep, the human brain switches to more primitive forms of activity, unable to normally control emotions, the emotional zones of the brain become reactive. A person becomes 60% more emotional and irritable, memorizing new material will be difficult for him. In a dream, special connections are formed between neurons in the human brain, which help to remember new information. Sleep deprivation makes the brain unable to adequately perform this function. Therefore, it is more difficult for people suffering from insomnia to concentrate, remember new things and remember what they learned earlier.

While a person is sleeping, his immune system works intensively. Therefore, sleep deprivation prevents the immune system from building up energy. With a decrease in immunity, a person becomes more vulnerable to respiratory infections. And those, in turn, can cause complications in the form of diseases of the respiratory system, accompanied by severe cough, nasal congestion and snoring, which in turn cause frequent awakenings at night.

The body needs at least 3 hours of uninterrupted sleep to produce testosterone. Waking up in the middle of the night can disrupt the production of this hormone and, as a result, cause an imbalance in the overall hormonal background. Frequent awakening at night can also interfere with the production of growth hormone.

Lack of sleep is also one of the risk factors for obesity. If a person sleeps less than 7 hours a day, the level of leptin in the body decreases, but instead the concentration of ghrelin increases, which stimulates the appetite.

Causes and pathogenesis of sleep disorders

The following causes of sleep disorders are distinguished: stress, psychoemotional stress, emotional disorders, somatic chronic diseases, pain, high blood pressure, climate change, drug abuse, breathing disorders during sleep, overeating.

Primary and secondary sleep disorders are distinguished. Primary disorders are not associated with any pathology, and secondary ones arise as a result of various diseases.

The duration of a person's sleep on average should be 8 hours, and it depends on factors - the mental, physical state of a person's health and the nature of his activity.

The main sleep disorders in adults include:

Insomnia - this is a violation of falling asleep and maintaining sleep, early awakening or a feeling of dissatisfaction with sleep.

Pathogenesis.

Insomnia is a disorder that manifests itself as a disturbance in the quality, quantity, or timing of sleep required for normal vigorous activity. This pathology causes a significant decrease in the quality of life, insufficient working capacity, and even personality changes. In addition, changes in the biochemical parameters of the body during sleep deprivation are directly related to a number of metabolic disorders. The etiology of insomnia can be very diverse. According to ICD-10, sleep disorders are primarily psychogenic, emotionally conditioned states.

Breathing problems during sleep – is a breathing disorder in which there is prolonged respiratory arrest during sleep.

Pathogenesis.

In obstructive sleep apnea syndrome, there is a violation of the patency of the upper airways and their regular overlap, which makes it difficult for oxygen to enter the lungs. With an acute lack of oxygen, a stress reaction of the body arises, the sympathetic nervous system is activated and blood pressure rises, which leads to imperceptible micro-awakenings during sleep. At this point, the brain opens the airways and breathing is restored.

Such micro-awakenings disrupt the structure of sleep, reduce the stages of sleep, which are important for the recovery of the body.

Bruxism.

In dentistry, a more frequent manifestation of the pathology of sleep disorders is bruxism.

Bruxism - paroxysmal tonic contractions of the masticatory muscles that periodically occur in a dream, accompanied by clenching of the jaws and grinding of teeth.

Bruxism has 2 circadian manifestations: during sleep-nocturnal bruxism (NB) and during wakefulness-daytime bruxism (DB)

DB – semi-voluntary "clenching" movements of the jaws under the influence of anxiety and stress during wakefulness

NB – stereotypical involuntary movements of the lower jaw that occur during sleep.

The pathogenesis of bruxism is still not clear, but there are 2 main theories: peripheral and central. The peripheral theory is based on occlusal disharmony (malocclusion), which stimulates chewing activity, and the Central theory is based on disorders in the stem, subcortical and cortical structures of the brain.

Purpose

To investigate the effect of sleep on the body, taking into account the physical and psycho-emotional state of a person, depending on the duration of full sleep and in case of its lack. To study the characteristic features of the phase of REM and slow sleep.

Sleep phases

There are two phases of sleep: slow and fast. These names are due to the peculiarities of the rhythm of the electroencephalogram during sleep by slow activity in the phase of slow sleep and faster in the phase of REM sleep.

NREM sleep has four stages: falling asleep stage, shallow NREM sleep, deep NREM sleep, deepest

slow sleep. Slow sleep, dreamless sleep makes up 75-80% of the entire period of night sleep. Low-amplitude muscle potentials on electromyography are manifested in all stages of slow wave sleep. During slow wave sleep, a decrease in body temperature is observed, pulse and respiration decrease, and there is no eye movement.

The REM sleep phase is characterized by a low-amplitude rhythm of electromyography, and in the frequency range by the presence of both slow and higher-frequency rhythms (alpha and beta rhythms). Signs of this sleep phase are sawtooth discharges with a frequency of 4-6 Hz per 1 second. The REM sleep phase is characterized by a rapid eye movement on the electrooculogram, a sharp decrease in the EMG amplitude or a complete drop in the tone of the

muscles of the diaphragm of the mouth and cervical muscles, the pressure rises, breathing, the pulse becomes more frequent, and sometimes limb movement is observed. Interruption of REM sleep is dangerous for the human psyche.

The best time to sleep and wake up lightly

Waking up	Going to sleep	Waking up	Going to sleep	Waking up	Going to sleep
6:00	20:45 -22:15	7:15	22:00-23:30	8:30	23:15-00:45
6:15	21:00 – 22:30	7:30	22:15-23:45	8:45	23:30-01:00
6:30	21:15 – 22:45	7:45	22:30-00:00	9:00	23:45-01:15
6:45	21:30 – 23:00	8:00	22:45-00:15	9:15	00:00-01:30
7:00	21:45 – 23:15	8:15	23:00-00:30	9:30	00:15-01:45

The most important restorative processes and the restart of the central nervous system occur between 22:00 and 24:00. If you want to wake up refreshed and refreshed, it's best to go to bed at this time. Due to the lack of proper rest, the nervous system wears out faster, and irritability and nervousness appear.

It is best to wake up during the rapid phase of sleep, when the sensitivity and activity of the body increase. If you wake up at a slow stage, weakness and fatigue appear, which will accompany a person throughout the day. You can use a sleep sensor or fitness tracker to find your ideal time to wake up. These devices analyze pulse, blood pressure and heart rate.

Conclusion

Healthy sleep is a guarantee of vigor, good physical condition, health and energy. Therefore, a person must have a full, healthy sleep in order to restore strength and normalize the vital processes of the whole body.

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