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THE ROLE OF TOBACCO IN THE HUMAN BODY, ITS MECHANISMS OF ACTION AND PREVENTION.

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Abstract

Nicotine is the main alkaloid of tobacco leaves, its content in cigarettes is approximately 95% of all alkaloids contained in this plant, of which there are more than a dozen. It is the main inducer of tobacco addiction. Tobacco products differ in nicotine content. Pipe tobacco contains about the same amount of nicotine as regular cigarettes, while cigars and chewing tobacco contain less nicotine.

Key words

Tobacco, oral cavity, smoking, gingivitis, toothpastes.

The severity index of smoking is based on two parameters – smoking at night, which undoubtedly indicates severe dependence and the number of cigarettes smoked while awake. Smoking Severity Index 1. When do you light your first cigarette after sleeping?

- Within the first 5 minutes – 3 points
- From 6 to 30 minutes – 2 points
- From 31 to 60 minutes – 1 point
- More than an hour – 0 points 2. How many cigarettes do you smoke on average in one day?
- 10 or less – 0 points
- from 11 to 20 – 1 point
- from 21 to 30 – 2 points
- More than 30 – 3 points

To assess the degree of dependence, the points are summed up: 1-2 points – light; 3-4 points – medium; 5-6 points – severe. When diagnosing the severity of addiction, it is necessary to take into account the presence of comorbid drug-related diseases, such as alcoholism. Recently, comparative studies have been conducted that prove a more severe course of nicotine addiction in patients with alcoholism [1,5].

There are tests aimed at identifying the level of motivation to quit smoking

and determining the chances of success of this step. Despite the fact that a number of authors recommend their use, they are not widely used by clinicians. A large number of psychometric scales are also currently used to diagnose tobacco addiction, willingness to quit smoking, and other aspects of this disease, but none of them can fully reflect the nature of tobacco addiction *9+. On the other hand, a tool for the diagnosis of tobacco dependence syndrome is the corresponding section of the International Classification of Diseases 10 revision (ICD10) – Mental and behavioral disorders caused by tobacco use (F. 17) it seems excessive for specialists of the general medical network, who only need to indicate the so–called "smoking status" - non-smoker, former smoker, casual smoker, daily smoker, oral tobacco user [4,10].

To establish the fact of tobacco or nicotine use, rapid immunochromatographic tests are used to determine cotinine in urine, the main metabolite of nicotine. The determination of carbon monoxide in exhaled air (CO) is the simplest method for monitoring smoking, using a smokelizer gas analyzer. A visual demonstration of the degree of reduction in carbon monoxide levels during smoking cessation is a good incentive to continue treatment, is used to control the dynamics of the condition, demonstrate the dangers of smoking and the effectiveness of a healthy lifestyle[5,9].

Carbon monoxide (CO) is measured in ppm (parts per million) using the attached diagram and is easily converted from ppm to % HCV (carboxyhemoglobin). Exhaled carbon monoxide analyzers with automatic detection of carboxyhemoglobin are also used. Normally, the concentration of carbon monoxide in the exhaled air of a non-smoker should not exceed 4 ppm. Most smokers have more than 10 ppm, this indicator correlates with the amount of tobacco smoked, a significant threshold value for separating smokers from non-smokers is 7 ppm [2].

It is widely used to assess the state of respiratory function in smokers. Various equipment is used to study the function of external respiration, blood gas composition, etc. The use of these diagnostic methods and familiarization with their results in the study of patients who smoke or quit smoking has a significant psychotherapeutic effect *28+. Their role is not essential to confirm the fact of smoking, the use of smokeless tobacco products, or the diagnosis of nicotine addiction. Treatment Approaches to the organization of medical care for people who use tobacco products are very similar in international practice and are based on recommendations developed by WHO *13+.

The success of a number of countries in reducing tobacco consumption is evidence of their scientific validity and effectiveness. The principles of tobacco

addiction treatment are based on the use of short preventive interventions, cognitive behavioral psychotherapy (CPT), nicotine replacement therapy (NRT), partial nicotine acetylcholine receptor agonist (varenicline), and the antidepressant bupropion [10].

The strategy of helping people with tobacco addiction is based on several basic principles. Any clinician directly involved in primary care (doctors, nurses, pharmacologists, etc.) who communicate directly with patients should actively identify smokers. A healthcare professional should have a conversation with each patient who smokes about the need to give up this addiction and offer him treatment. It is important to provide the smoking patient with at least a brief conversation or information materials at each visit.

A well–known intervention model called "5A" is used - Ask / Ask; Advise / Advise; Assess/ Evaluate; Assist/ Help; Arrange Follow-up / Organize follow-up [33]. A more concise therapeutic strategy is reflected in the ABC model (Ask about smoking status, give brief advice to quit, and offer session treatment)[9].

The principle of brevity of the strategy (3-5 minutes conversation), according to a number of researchers, significantly increases its effectiveness at the primary health care level, secondly, it is easier to standardize, and thirdly, it seems to provide a similar result of intervention, as with lengthy, longer conversations [4].

Nicotine Replacement Therapy (NRT) For adequate therapy, it is important to choose the optimal dose of nicotine, the method of its delivery and the duration of use. If a person smokes less than 5 cigarettes a day, then he can stop smoking without NRT, if he smokes 5-10 cigarettes, then an average of 7 mg of nicotine is required, 11-17 cigarettes – 14 mg of nicotine, 18-24 cigarettes (1 pack) – 21 mg, 2 packs – 35 mg, more than 2 packs – 42 mg of nicotine per day. The features of the pharmacodynamics of various dosage forms of NRT allow you to individually select a particular treatment regimen. For example, nasal spray provides the fastest delivery of nicotine into the body, and, consequently, a faster reduction in withdrawal syndrome, which, on the other hand, increases the risk of developing a nicotine overdose[3,7].

It is suitable for use in cases of severe nicotine dependence [62]. Inhalation systems, in fact, are not inhalation, and nicotine absorption occurs in the oral cavity, not in the alveoli, so the required nicotine concentration is achieved more slowly than with smoking or nasal spray. At the same time, their use preserves the habitual pattern of smoker behavior[2].

According to pharmacoeconomic indicators, chewing gum is the most accessible form of NRT for the majority of the smoking population. Its advantages are a low risk of overdose, the possibility of flexible dose control, and faster

achievement of the required nicotine concentration than with transdermal systems. The use of chewing gum is difficult for people with severe dental diseases.

When recommending this type of NRT to patients, it is important to teach the patient the correct chewing technique to ensure optimal intake of nicotine into the body. Transdermal systems (patches) provide a slow, constant release of nicotine. There are two manufacturers of patches available in our country, the difference lies in their duration of action[9].

In one case, the patch is recommended for use for 16 hours a day with removal at night, in the other, the patch is applied for 24 hours. These differences are related to the data that the majority of smokers do not use tobacco at night and, therefore, there is no need to use NRT at night. In our opinion, both approaches have clinical grounds, but when choosing a product, it is necessary to take into account the individual characteristics and daily rhythm of smoking patients. The duration of NRT is determined individually and is 3-6 months. Combining several forms of NRT drugs equalizes the nicotine dose and allows you to take into account the needs of a particular patient, which can significantly increase the effectiveness of therapy compared to NRT based on a single drug[11].

Even a combination of several forms of nicotine replacement therapy is safe and well tolerated by patients. The side effects of NRT rarely force the discontinuation of therapy. Evidence of high safety is the decision of some countries to allow the sale of NRT drugs in supermarkets and other retail outlets in order to increase the availability of treatment [5].

Another first-line therapy drug is varenicline. Varenicline is a partial alpha-beta 2 nicotinic acetylcholine receptor agonist with dual action. On the one hand, having a lower internal strength in relation to nAHP, compared with nicotine, it activates the receptor to a lesser extent, contributing to the release of less dopamine than with smoking. On the other hand, varenicline exhibits an antagonistic effect against nicotine, as it has a high affinity for nAHP. Thus, when taking varenicline, a person does not experience the usual effects of tobacco smoking and pronounced withdrawal symptoms when quitting smoking. The release of dopamine caused by the action of varenicline is insignificant and therefore does not lead to the development of dependence on the drug [9].

The effectiveness of varenicline in the treatment of tobacco smoking has been confirmed by numerous studies and surpasses the effectiveness of other drugs for the treatment of nicotine dependence, mainly by reducing the likelihood of smoking relapse. Varenicline offers a treatment option for smokers whose needs and capabilities are not addressed in various clinical guidelines recommending abruptly quitting smoking [43]. In the UK, in 2008, the Agency for the Control of

Medical Products (ACMP) published a notice on the risk of suicidal thoughts and behavior while taking varenicline. In the USA, in 2009, warnings appeared about the ability of varenicline (registered in the USA under the trade name Shantix) to increase the risk of developing mental disorders. In particular, the FDA (Food and Drug Administration) informed the public about the risk of developing mental disorders, which were manifested by changes in behavior, agitation, depressive states, and suicidal attempts. In addition, it is suspected that the drug may cause seizures and loss of consciousness, possibly as a result of a sudden cardiac arrhythmia. Violations are possible even after drug withdrawal. The FDA is still continuing to assess the risk of neuropsychiatric complications. Final results are expected by 2017 *64+.

These warnings were based on spontaneous reports of adverse drug reactions. The meta-analysis found no evidence of an increased risk of suicide or suicidal activity, depression, or death associated with taking varenicline. As a result of the study, evidence was obtained that varenicline is more likely associated with a high risk of sleep disorders such as insomnia and strange dreams, but these side effects are already well known [7]. Admission schedule: smokers should set a date for quitting smoking, preferably one week after the start of taking varenicline. The usual initial dose is 0.5 mg of varenicline once a day for the first 3 days, then 0.5 mg twice a day for the next 4 days, then 0.5 mg twice a day for a week and increased to 1 mg twice a day from day 15. The maximum dose of varenicline is 2 mg per day. Varenicline should be taken after meals, washed down with a full glass of water. The recommended course of treatment is 12 weeks. Since 2010, cytisine has been registered in the Russian Federation (now available without a prescription), which has been used to treat smoking since the 60s. Cytisine is a plant alkaloid found in plants such as Golden Rain (Cytisus Laburnum), which is toxic to humans, however, when using a therapeutic dose (1.5-9 mg of cytisine per day), it is well tolerated if the recommendations set out in the instructions for use of the drug are followed. [12].

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