

Current Approaches to The Treatment of Chronic Diseases: Prospects for The Use of Innovative Methods and Technologies in Medicine

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ABSTRACT

This article examines current approaches to the treatment of chronic diseases and prospects for the use of innovative methods and technologies in medicine. The paper presents an overview of modern methods of treatment of chronic diseases, such as drug therapy, exercise, diet and lifestyle changes. New methods are also being considered, such as the use of technologies related to AI, biotechnology, gene therapy, nanotechnology, etc. In addition, the authors describe how these methods can help in more accurate diagnosis and the choice of individual treatment for the patient. The article also discusses the advantages and disadvantages of each method, as well as the potential risks and ethical issues associated with their use. The authors conclude that the use of innovative methods and technologies can significantly improve the effectiveness of treatment of chronic diseases and improve the quality of life of patients, but also requires additional research and regulation by medical organizations and governments. One of the most promising areas in the treatment of chronic diseases is the use of AI and machine learning. These technologies can help in more accurate diagnosis, selection of individual treatment, monitoring of the patient's condition and prediction of possible complications. Biotechnologies also provide new opportunities in the treatment of chronic diseases. For example, the use of therapeutic proteins and gene therapy can be effective in the treatment of certain forms of cancer, cystic fibrosis and other diseases. Nanotechnology may also have significant potential in the treatment of chronic diseases. Nanoparticles can be used to deliver drugs to specific places in the body and to diagnose early stages of diseases. However, it should be borne in mind that the use of innovative methods and technologies is also associated with risks and ethical issues. For example, when using gene therapy, unexpected side effects are possible, and the use of AI and machine learning can lead to problems with the confidentiality of patient data. In general, the use of innovative methods and technologies can significantly improve the effectiveness of treatment of chronic diseases and improve the quality of life of patients. However, before the introduction of these methods and technologies into medical practice, it is necessary to conduct thorough research, evaluate the effectiveness and safety, as well as take into account ethical and legal aspects.

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INTRODUCTION

Chronic diseases such as diabetes, Alzheimer's disease, cancer, cardiovascular diseases and others are one of the most serious problems of modern medicine. These diseases affect millions of people around the world and require long and expensive treatment [1].

In recent years, there has been significant progress in medicine in the treatment of chronic diseases. Innovative methods and technologies, such as AI, biotechnology, gene therapy and nanotechnology, provide new opportunities in the diagnosis and treatment of these diseases. However, before introducing new methods and technologies into medical practice, it is necessary to carefully evaluate their effectiveness, safety and ethical aspects.

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It is also important to develop strategies to integrate these methods and technologies into the existing medical system and ensure accessibility for all patients.

The purpose of this article is to consider current approaches to the treatment of chronic diseases and prospects for the use of innovative methods and technologies in medicine. The paper presents an overview of modern methods of treatment of chronic diseases, as well as new methods and technologies, their advantages and disadvantages, potential risks and ethical issues.

MATERIALS AND METHODS

When writing the study, an analysis of the literature on the topic of various authors was carried out, and comparative and analytical research methods were also used.

RESULTS

Chronic diseases are diseases that progress for a long time and exist in the body for a long time, often accompanied by periods of exacerbation and remission. These diseases can be caused by various causes, including genetic factors, infections, toxic substances, bad habits and others.

Examples of chronic diseases are:

1. cardiovascular diseases, such as arterial hypertension, coronary heart disease, arrhythmias, etc.
2. oncological diseases, such as breast cancer, lung cancer, skin cancer and others.
3. neurological diseases such as Alzheimer's disease, Parkinson's disease, sclerosis, etc.
4. respiratory diseases such as chronic obstructive pulmonary disease (COPD), asthma, etc.
5. endocrine diseases such as diabetes, hypothyroidism, etc.
6. rheumatic diseases, such as rheumatoid arthritis, osteoarthritis, etc. [2].

Chronic diseases can significantly limit the patient's quality of life, increasing the risk of disability and mortality. Often, the treatment of chronic diseases requires long and expensive medical care.

Features of the treatment of chronic diseases include an individual approach to each patient, a multi-professional approach to treatment, monitoring the progression of the disease, effective use of medications and adherence to a healthy lifestyle. It is also important to provide patients with the necessary information and support in the process of treatment and management of their condition.

Modern methods of treating chronic diseases include various approaches, from lifestyle changes and the use of medications to the use of innovative methods and technologies. Lifestyle changes, such as proper nutrition, exercise, quitting smoking and reducing alcohol consumption, can help control some chronic diseases, such as diabetes, cardiovascular diseases,

obesity, etc.

Medications such as antibiotics, antihypertensive agents, insulin, cancer drugs and others are also widely used to treat chronic diseases. Some of these drugs, such as monoclonal antibodies, have become available thanks to the development of biotechnology and molecular medicine.

Innovative methods of treatment of chronic diseases include various approaches, such as gene therapy, organ transplantation, immunotherapy, genetic tests, neurostimulation, etc. For example, gene therapy uses genes to treat genetic diseases, organ transplantation can be used to treat chronic kidney failure, and immunotherapy can be used to treat cancer.

Digital technologies have also been actively developing recently, such as real-time monitoring of the patient's condition, telemedicine, various applications for disease management, etc.

In general, modern methods of treating chronic diseases can help improve the quality of life of patients, reduce the risk of disability and mortality, as well as reduce the cost of medical care. However, each approach should be chosen individually for each patient, depending on his condition and the characteristics of the disease [3].

There are a number of problems associated with the treatment of chronic diseases:

- low effectiveness of treatment. Some chronic diseases are difficult to control, even with the use of modern methods of treatment. For example, some patients with diabetes mellitus, hypertension or cancer may have resistance to treatment;
- undesirable side effects of medications. Medications that are used to treat chronic diseases may have undesirable side effects, such as nausea, headache, diarrhea, etc. These side effects can lead to a decrease in the patient's quality of life and deterioration of his condition;
- high treatment costs. Treatment of chronic diseases can be expensive, especially for patients who need long-term therapy and expensive medications. High costs can lead to the fact that some patients cannot afford to pay for treatment or limit its duration and intensity;
- non-compliance by patients with treatment requirements.

Some patients may not comply with treatment, especially if they do not feel any symptoms or do not see an improvement in their condition. This can lead to the progression of the disease and the deterioration of the patient's condition;

- insufficient use of innovative methods. Some innovative treatments for chronic diseases, such as gene therapy, immunotherapy and telemedicine technologies, may be expensive or not available in all regions. This may lead to some patients not getting access to the best treatments [4].

However, with the development of medical technologies and approaches to the treatment of chronic diseases, these

problems can be solved, and patients can receive more effective and affordable treatment. For example, the use of innovative methods, such as telemedicine technologies, can improve the availability of treatment for patients who live in remote regions or have limited financial resources [5].

Also, the development of personalized medicine, which is based on the individual characteristics of the patient and his genetic characteristics, can increase the effectiveness of treatment and reduce the risk of undesirable side effects. However, to solve the problems of treating chronic diseases, it is necessary not only to develop new technologies and treatment methods, but also to train medical professionals and increase patient awareness of new approaches to treatment. It is also necessary to conduct research and analyze data to determine the most effective treatment methods and improve the results of treatment of chronic diseases.

Lifestyle changes can play a key role in controlling chronic diseases. For example, establishing a healthy lifestyle, including proper nutrition, physical activity, adequate rest and stress reduction, can help reduce the risk of developing many chronic diseases, such as diabetes, cardiovascular diseases, obesity, etc.

For patients already suffering from chronic diseases, lifestyle changes can help manage symptoms and prevent disease progression. For example, reducing salt and fat intake in the diet can help manage blood pressure in patients with hypertension. Physical activity can help improve blood glucose control in diabetic patients.

Lifestyle changes can be difficult for some patients, especially for those who live in an environment of unfavorable ecology, have limited access to fresh and healthy food, or live in an environment of constant stress. Therefore, it is important to provide support and information to patients on how to make changes in their lifestyle in order to manage their disease and improve their health. Many medical institutions offer programs to educate patients about a healthy lifestyle and methods of managing chronic diseases [6].

Drug therapy plays an important role in the treatment of chronic diseases, especially in cases where lifestyle changes are not sufficient to achieve control over the disease. Drug therapy can be aimed at reducing the symptoms of the disease, preventing the progression of the disease, as well as improving the quality of life of the patient.

There are different groups of medicines for different chronic diseases. For example, antihypertensive, anticoagulant, antiarrhythmic and other drugs are used to treat cardiovascular diseases. Hypoglycemic drugs, insulin, as well as medications aimed at managing concomitant diseases are used to treat diabetes. However, it is important to remember that drug therapy can have side effects and interact with other drugs, so when prescribing medications, it is important to follow the doctor's recommendations and regularly monitor the patient's condition.

In addition, drug therapy is not always the only method of

treating chronic diseases, and can be used in combination with lifestyle changes, physical rehabilitation and other methods of treatment [7]. Modern medicine is constantly working on the creation of new innovative methods and technologies for the treatment of chronic diseases. Let's look at some of them.

1. Gene therapy is a treatment method that aims to change the patient's genetic material to correct the disorders that cause the disease. Gene therapy can be used to treat various chronic diseases, such as cystic fibrosis, hemophilia, diabetes, Alzheimer's disease and others.

2. Immunotherapy is a treatment method that aims to activate the patient's immune system to fight the disease. Immunotherapy can be used to treat cancer, rheumatoid arthritis and other chronic diseases.

3. Nanotechnology is a treatment method based on the use of nanomaterials to deliver medicines to the desired area of the body. This makes it possible to improve the effectiveness of drug therapy and reduce its side effects.

4. Telemedicine is a treatment method based on the use of information and communication technologies for remote consultation of patients and monitoring of their condition. Telemedicine allows timely detection of changes in the patient's condition and quick response to them.

5. Artificial intelligence and big data analysis are methods that can be used to determine the most effective methods of treating chronic diseases based on the analysis of large amounts of data about patients and their treatment.

Gene therapy is an innovative treatment method based on changing the patient's genetic material to treat the disease. This method can have a huge potential for the treatment of chronic diseases, such as genetically determined metabolic disorders, certain types of cancer, hereditary forms of Alzheimer's disease, hemophilia and other diseases. Gene therapy can include various approaches, such as replacing or correcting damaged genes, introducing new genes into the body, or blocking certain genes that cause disease. Gene therapy can also be performed using vectors, such as viruses, to deliver genetic material to the patient's body [8].

Currently, gene therapy is under active research and development, but there are already some successful examples of the use of this method in the treatment of chronic diseases. For example, several gene therapies have already been approved in the USA, including the treatment of sideroblastic anemia, adenosine deaminase deficiency and spinal muscular atrophy. In addition, research is being conducted on gene therapy for the treatment of other diseases, such as cystic fibrosis, Parkinson's disease, hemophilia and others.

However, despite the potential benefits, gene therapy also has its limitations and problems, such as high cost, difficulty in delivering genetic material to the right cells, possible side effects and long-term consequences.

It should also be noted that gene therapy cannot be used for all types of chronic diseases, but only for those that are

associated with genetic defects. In addition, for successful gene therapy, it is necessary to conduct preliminary diagnostics and genetic studies.

Immunotherapy is a treatment method that uses the patient's own immune system to fight the disease. This method can be used to treat various diseases such as cancer, rheumatoid arthritis, autoimmune diseases and others. In cancer treatment, immunotherapy can be used to enhance the immune system's response to cancer cells so that the body can fight cancer more effectively. This can be achieved in various ways, for example, using monoclonal antibodies that target specific proteins on the surface of cancer cells, or using vaccines that stimulate the immune system to fight cancer [9].

In the case of rheumatoid arthritis and other autoimmune diseases, immunotherapy can be used to reduce the activity of the immune system, which attacks the body's own tissues. This can be achieved, for example, with the help of immunosuppressants that suppress the activity of the immune system. Immunotherapy is one of the most promising methods of treating various diseases, and research in this area continues.

Nanotechnology is a treatment method that uses nanomaterials to deliver drugs to the desired area of the body. This makes it possible to improve the effectiveness of drug therapy and reduce its side effects. Nanomaterials can be of various shapes and compositions, for example, nanoparticles, nanofibers, nanorobots and others. They can be functionalized in such a way as to increase their stability and improve their ability to deliver drugs to the desired area of the body.

The delivery of medicines using nanomaterials can occur by various mechanisms, for example, passive or active targeting. With passive targeting, nanomaterials deliver drugs to a certain area of the body due to the features of the tumor microenvironment, which allow nanomaterials to accumulate better in the tumor tissue. With active targeting, nanomaterials can be functionalized so that they can recognize and bind to certain molecules on the tumor surface.

The use of nanotechnology for drug delivery has many advantages, such as more effective treatment, reduction of side effects and improvement of the quality of life of patients. However, like any new treatment method, nanotechnology requires additional research and testing to assess their safety and effectiveness in clinical settings.

Telemedicine is a treatment method based on the use of information and communication technologies for remote consultation of patients and monitoring of their condition. Telemedicine technologies allow contacting medical specialists and receiving consultations, even if they are at a considerable distance from the patient [10].

Telemedicine can be used for consulting patients, prescribing treatment, monitoring the patient's condition, as well as for collaboration of medical specialists in real time. This makes it possible to detect changes in the patient's condition in a timely manner and respond quickly to them. Telemedicine can also

reduce the cost of medical care, especially in cases where patients need to see a doctor regularly.

Telemedicine is used in many fields of medicine, including teleradiology, teledermatology, telecardiology, teleneurology and others. For example, in teleradiology, doctors can remotely view X-rays, magnetic resonance imaging and other images and give diagnoses to patients at a distance. In telecardiology, medical specialists can remotely monitor the patient's cardiac activity and make recommendations for treatment.

Telemedicine was an important treatment method, especially in the context of the COVID-19 pandemic, when remote patient care became even more necessary. However, not all types of medical care could be provided remotely, and in some cases the personal presence of medical personnel was required.

Artificial intelligence and big data analysis are playing an increasingly important role in medicine, especially in determining optimal treatments for chronic diseases. Large amounts of data obtained from medical research allow us to analyze the effectiveness of various treatment methods and determine which of them are most effective for a particular type of disease or patient. Artificial intelligence, in turn, can be used to analyze this data and provide recommendations to doctors regarding the best treatment for each patient [11].

DISCUSSION

Innovative approaches to the treatment of chronic diseases have a number of advantages over traditional methods of treatment. Here are some of them:

- higher efficiency of treatment. Innovative treatments for chronic diseases may be more effective than traditional treatments. For example, immunotherapy and targeted therapy can target certain cells or proteins, which increases the effectiveness of treatment and reduces the risk of side effects.;
- fewer side effects. Many innovative treatments have fewer side effects than traditional treatments. For example, nanotechnology allows drugs to be delivered directly to a tumor or an affected organ, minimizing side effects;
- a more individualized approach to treatment. Innovative treatment methods allow a more individualized approach to the treatment of patients. The use of artificial intelligence and big data analysis makes it possible to take into account the individual characteristics of each patient when choosing treatment methods;
- faster detection and treatment. The use of telemedicine allows timely detection of changes in the patient's condition and quick response to them. It also makes it possible to provide access to treatment for patients who are located in remote or hard-to-reach regions;
- improving the quality of life. The use of innovative treatment methods can improve the quality of life of patients, especially

those with chronic diseases. This is due to an improvement in the effectiveness of treatment, a reduction in side effects and a more individualized approach to treatment [12].

In addition, innovative methods of treatment can significantly improve the quality of life of patients, allowing them to maintain their functions and capabilities that may be limited by traditional methods of treatment. For example, organ transplantation can restore to a person the possibility of a full life, which he lost with chronic organ failure [13].

Innovative treatments can also reduce the cost of treating patients in the future, by using resources more efficiently and preventing additional complications and treatments that may occur with traditional treatments. For example, the use of telemedicine can reduce the number of patient visits to hospitals and clinics, which will reduce the burden on the healthcare system and the cost of medical care. Finally, innovative treatment methods can contribute to the development of medical science and technology, which may lead to the creation of new and more effective treatment methods in the future [14].

Despite many advantages, innovative approaches to the treatment of chronic diseases also have some disadvantages. Firstly, new treatments can be very expensive, which can lead to limited access to them for many patients. For example, immunotherapy for cancer treatment can cost hundreds of thousands of dollars per course of treatment, which is not available to many people.

Secondly, innovative treatment methods may still be insufficiently studied and have unknown side effects and complications. Some new drugs and treatments may have potentially dangerous side effects that may become known only after many years of use.

Thirdly, some new methods of treatment may be difficult to apply and require special qualifications and training of medical personnel. This may lead to the fact that these treatments will not be available to patients living in remote or sparsely populated areas where there are no qualified specialists. Fourth, innovative treatment methods may raise ethical and moral issues related to the use of new technologies. For example, the use of gene therapy may lead to ethical issues related to changes in human genetic information [15].

Innovative treatment methods may be new and unknown to most doctors and patients, which may hinder their effective use. It takes time and effort to train medical professionals and patients in new treatment methods.

In addition, many studies and clinical trials need to be conducted to prove the effectiveness and safety of innovative treatment methods, which requires a lot of time and financial costs. Some innovative treatments may be less effective than expected or have undesirable side effects.

When developing and implementing new treatment methods, errors and shortcomings may arise that may lead to undesirable results. It is important to conduct thorough testing and quality

control during the development and implementation of new treatment methods in order to minimize the risk of errors and shortcomings [16].

The integrated application of innovative approaches to the treatment of chronic diseases can have significant prospects for improving the effectiveness of treatment and improving the quality of life of patients. For example, using a combination of immunotherapy and nanotechnology can improve the effectiveness of cancer treatment, reduce the risk of relapses and improve the prognosis of survival. Combining organ transplantation with the use of telemedicine technologies will allow timely detection and prevention of complications after surgery, accelerate the rehabilitation of the patient and increase his chances of successful adaptation after transplantation. Big data analysis and the use of artificial intelligence will allow individualizing treatment, taking into account the individual characteristics of the patient and his response to treatment, as well as optimizing the use of healthcare resources.

However, it should be borne in mind that the integrated application of innovative approaches to the treatment of chronic diseases may face a number of obstacles. In particular, this may be due to the high cost of using modern technologies, the complexity of their implementation and the need to train medical personnel in new techniques and technologies. In addition, it is necessary to take into account the ethical and legal aspects of the use of new treatment methods, for example, related to the protection of personal data of patients and the preservation of their confidentiality [17].

Nevertheless, the integrated application of innovative approaches to the treatment of chronic diseases can significantly improve the quality of life of patients and increase the effectiveness of treatment, which makes this area promising for development and further research [18].

CONCLUSION

Chronic diseases remain one of the main challenges of modern medicine, as they are the main cause of death and disability in many countries of the world. In this regard, the search for effective methods of treating chronic diseases remains an urgent task of medicine. Innovative approaches to the treatment of chronic diseases, such as gene therapy, immunotherapy, nanotechnology, organ transplantation, telemedicine and big data analysis, provide new opportunities to combat these diseases. The use of these methods can significantly increase the effectiveness of treatment, reduce side effects and improve the quality of life of patients.

However, these methods also have disadvantages, such as high cost, complexity of application and limited availability. Most of them require large investments in research and development, as well as specialized knowledge and experience for their application.

Despite these shortcomings, innovative approaches to the

treatment of chronic diseases represent a perspective for the future development of medicine. The complex application of these methods, combined with the use of artificial intelligence and big data analysis, can lead to new discoveries and improve treatment outcomes.

Thus, innovative approaches to the treatment of chronic diseases have great potential to improve the health and quality of life of patients. But for their successful implementation, further work in the field of research and development is necessary, as well as the widespread introduction of these methods into healthcare practice.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

All authors contributed in reviewing the final version of this paper

REFERENCES

1. Singh H, Meyer AND, Thomas EJ. The frequency of diagnostic errors in outpatient care: estimations from three large observational studies involving U.S. adult populations. *BMJ Qual Saf.* 2014;23:727-731
2. Hansen LO, Young RS, Hinami K, Leung A, Williams MV. Interventions to reduce 30-day rehospitalization: a systematic review. *Ann Intern Med* 2011;155:520-528
3. Boulton C, Leff B, Boyd CM, et al.. A matched-pair cluster-randomized trial of guided care for high-risk older patients. *J Gen Intern Med* 2013;28:612-621
4. Vinton DT, Capp R, Rooks SP, Abbott JT, Ginde AA. Frequent users of US emergency departments: characteristics and opportunities for intervention. *Emerg Med J* 2014;31:526-532
5. Johnson TL, Rhinehart DJ, Durfee J, et al.. For many patients who use large amounts of health care services, the need is intense yet temporary. *Health Aff* 2015;34:1312-1319
6. G Novara, E Checcucci, A Crestani, et al. Telehealth in urology: A systematic review of the literature. How much can telemedicine be useful during and after the COVID-19 pandemic? *Eur Urol*, 78 (6) (2020), pp. 786-811
7. Sim Mobile devices and health *N Engl J Med*, 381 (10) (2019), pp. 956-968
8. G Flodgren, A Rachas, AJ Farmer, et al. Interactive telemedicine: Effects on professional practice and health care outcomes *Cochrane Database Syst Rev*, 2015 (9)
9. J Thakkar, R Kurup, TL Laba, et al. Mobile telephone text messaging for medication adherence in chronic disease: A meta-analysis *JAMA Intern Med*, 176 (3) (2016), pp. 340-349
10. AL Fortmann, LC Gallo, MI Garcia, et al. Dulce Digital: An mHealth SMS-based intervention improves glycemic control in Hispanics with type 2 diabetes *Diabetes Care*, 40 (10) (2017), pp. 1349-1355
11. I Ahmed, NS Ahmad, S Ali, et al. Medication adherence apps: Review and content analysis *JMIR Mhealth Uhealth*, 6 (3) (2018), p. e62
12. A Elnaggar, V Ta Park, SJ Lee, et al. Patients' use of social media for diabetes self-care: Systematic review *J Med Internet Res*, 22 (4) (2020), p. e14209
13. R Patel, T Chang, SR Greysen, et al. Social media use in chronic disease: A systematic review and novel taxonomy *Am J Med*, 128 (12) (2015), pp. 1335-1350
14. Y Jiang, F Liu, J Guo, et al. Evaluating an intervention program using WeChat for patients with chronic obstructive pulmonary disease: Randomized controlled trial *J Med Internet Res*, 22 (4) (2020), p. e17089
15. H. Saner European Congress on eCardiology and eHealth 2018 *Eur Heart J*, 40 (34) (2019), pp. 2839-2841
16. A Trettel, L Eissing, M Augustin Telemedicine in dermatology: findings and experiences worldwide - a systematic literature review *J Eur Acad Dermatol Venereol*, 32 (2) (2018), pp. 215-224
17. P Indraratna, D Tardo, J Yu, et al. Mobile phone technologies in the management of ischemic heart disease, heart failure, and hypertension: Systematic review and meta-analysis *JMIR Mhealth Uhealth*, 8 (7) (2020), p. e16695
18. A Patel, D Praveen, A Maharani, et al. Association of multifaceted mobile technology-enabled primary care intervention with cardiovascular disease risk management in rural Indonesia *JAMA Cardiol*, 4 (10) (2019), pp. 978-986