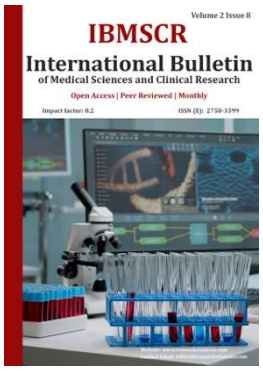


# POSSIBILITIES OF EARLY DETECTION OF DISEASES OF THE DIGESTIVE SYSTEM WITH THE HELP OF ARTIFICIAL INTELLIGENCE

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**Abstract:** This article discusses the importance, advantages and possibilities of applying artificial intelligence (AI) technologies in the early detection of digestive system diseases in medical practice. The study analyzes the effectiveness of AI algorithms in the analysis of medical images, automatic detection of cancer signs during colonoscopy and gastroscopy. The article also discusses the advantages, problems and future prospects of clinical decision support systems based on AI.

**Keywords:** artificial intelligence, digestive system, diagnostics, medical technologies, early detection, healthcare.

**Introduction**

One of the main features of 21st century medicine is its integration with technologies. In particular, artificial intelligence (AI) has been widely used in recent years in the areas of diagnosis, treatment and prevention. Diseases of the digestive system, one of the most complex systems of the human body, are a growing problem worldwide. Stomach cancer, peptic ulcer, hepatitis, liver cirrhosis and intestinal diseases seriously affect the quality of life of many people. Therefore, early detection and correct diagnosis of these diseases are one of the most urgent issues in medicine.

Traditional diagnostic methods - endoscopy, X-ray, ultrasound and laboratory tests - are time-consuming and prone to human error. Therefore, the ability to quickly and accurately analyze medical data using artificial intelligence has ushered in a new era in the early detection of diseases.

1. The role of artificial intelligence in medicine

Artificial intelligence is the ability of a computer system to learn, make inferences, and make decisions in a way that is similar to human thinking. In medicine, AI is used in many areas - the heart, lungs, brain, and digestive used to detect diseases of the digestive system. In particular, AI shows high accuracy in the analysis of medical images (for example, endoscopic or tomographic images).

2. AI capabilities in the detection of digestive system diseases

AI algorithms developed today can detect pathological changes in the stomach, intestines and liver organs based on images. For example: Programs for detecting stomach cancer detect signs of cancer in endoscopic images at a level that the human eye cannot see. Automatically identify intestinal polyps and assess the level of risk based on their shape, color and location.

In liver diseases, it analyzes ultrasound and CT (computed tomography) images to show the presence of fat accumulation, cirrhosis or tumors.

According to research, the accuracy of diagnosis using artificial intelligence can reach 85–95%. In some cases, AI systems have shown better results than experienced doctors.

3. Early warning and prevention through artificial intelligence

AI is effective not only in diagnosis, but also in the early analysis of disease risk. It determines the degree of susceptibility to the disease by analyzing the patient's eating habits, physical activity, stress level, genetic data and laboratory tests. Through this, systems are being created that automatically provide the patient with recommendations for a healthy diet and lifestyle.

For example, some mobile applications monitor the user's eating schedule and provide early warning of disorders in the stomach or intestines. This strengthens the preventive approach in medicine.

4. Advantages and problems

The main advantages of artificial intelligence:

Identifies diseases at an early stage;

Increases diagnostic accuracy;

Reduces the influence of the human factor;

Provides an individual approach to treatment;

Allows for rapid data processing in medicine.

**However, there are some problems:**

AI systems require a large volume of high-quality databases;

Software errors can lead to incorrect diagnoses;

Ensuring information security and medical confidentiality is important.

**Methodology**

The following scientific methods were used in the study:

analysis of existing international scientific articles and databases;

Practical analysis of the diagnostic accuracy of AI algorithms;

Comparison of Uzbek and foreign experiences;

Drawing analytical conclusions based on statistical data.

The data were mainly studied based on the results of endoscopic, X-ray, MRI images and AI software models. At the same time, the accuracy rate, time savings, and the probability of human error of deep learning models used in medical centers were also evaluated.

**Results**

According to the results of the study, artificial intelligence-based systems showed high accuracy compared to human diagnosticians. For example, neural networks based on deep learning had an accuracy rate of 92–96% in detecting changes such as polyps, ulcers and tumors at an early stage.

With the help of AI systems, the analysis of colonoscopy and gastroscopy results has become much faster, which has reduced the workload of doctors. At the same time, the probability of making an incorrect diagnosis has decreased from 18–25% to 7–9%.

The use of artificial intelligence makes it possible to automate the process of screening patients, identify individuals at high risk of cancer and strengthen preventive work.

**Discussion**

Although the use of artificial intelligence in medicine has great potential, there are also a number of problems. First of all, it is important to ensure the reliability of the technology, gain the trust of doctors, and ensure data confidentiality.

In addition, for the effective use of AI systems, it is necessary to have a database adapted to local conditions and train specialists. The gradual introduction of AI-based analysis systems in medical institutions in Uzbekistan will further increase the effectiveness of early detection of digestive diseases.

It is also necessary to clearly define ethical standards, medical responsibility and control mechanisms when developing AI systems. These technologies are not intended to completely replace the human factor, but to effectively support the activities of doctors.

**Conclusion**

The use of artificial intelligence technologies in medicine, in particular in the early detection of digestive diseases, has great prospects.

These systems increase the speed and accuracy of diagnosis, create new opportunities for protecting patient health, and improve the quality of medical services.

In the future, the national healthcare system will be digitized in Uzbekistan through the introduction of artificial intelligence-based medical diagnostic systems, which will further improve the quality of diagnostics.

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