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THE ROLE OF MODERN COMPUTER TECHNOLOGIES IN THE DIAGNOSIS AND TREATMENT OF GASTROINTESTINAL DISEASES

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Abstract
This article highlights the role of modern computer technologies in the diagnosis and treatment of gastrointestinal diseases. With the help of artificial intelligence, computed tomography, endoscopic systems and data processing programs used in medicine, the possibilities for early detection of diseases, correct diagnosis and selection of individual treatment methods are expanding. Also, ways of monitoring and effective control of the patient's condition through analytical platforms and digital monitoring systems are considered. The study analyzes the role of innovative technologies in combating gastrointestinal diseases based on statistical data and identifies promising areas.

Keywords: Gastrointestinal diseases, computer technologies, artificial intelligence, diagnostic systems, endoscopy, digital medicine, diagnosis, medical information systems

Introduction

Technological developments in modern medicine play an important role in protecting human health and early detection of diseases. In particular, the use of computer technologies in the process of diagnosing and treating common problems

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such as gastrointestinal diseases, which affect the quality of life of many patients, is becoming an integral part of modern treatment approaches. This article discusses the role of computerized methods and artificial intelligence systems in this area, their effectiveness and prospects.

Currently, among diseases related to the gastrointestinal tract, gastritis, ulcer disease, stomach or intestinal cancer, intestinal inflammation, dysbacteriosis are widespread, and these diseases are often not detected in time, which leads to delayed treatment measures. From this point of view, modern diagnostic tools, in particular computed tomography, capsule endoscopy, digital ultrasound devices, as well as software based on data analysis, are of great help in this direction.

The rapid development of information technologies in the collection, storage and analysis of medical data has greatly simplified the diagnostic process. By automatically analyzing clinical data collected about a patient using artificial intelligence, it is possible to reduce errors, detect diseases early and develop individual treatment plans. At the same time, patients are receiving qualified medical care from remote regions through telemedicine and online consultation platforms.

As the author of this article, the reason for choosing this topic is that I have observed an increase in the effectiveness of combating gastrointestinal diseases through the integration of medicine with technology. The healthcare system of Uzbekistan is also making progress in this area and, using foreign experience, is striving to develop digital healthcare.

This article will comprehensively cover the role of modern computer technologies in the diagnosis and treatment of these diseases, practical examples, analytical approaches, as well as existing problems and prospects. The goal is to formulate proposals and recommendations that will serve to improve patient health through the effective use of information technologies in the medical field.

Literature Review

Scientific research on the role of modern computer technologies in the diagnosis and treatment of gastrointestinal diseases has expanded significantly in recent years. Based on the scientific developments of foreign and domestic scientists, the technologies used in this area increase the accuracy and speed of the diagnostic process and improve the quality of treatment.

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In particular, studies published by the World Health Organization (WHO), the American Gastroenterological Association (AGA), and the European Society of Endoscopy show that it is possible to make a diagnosis with greater accuracy than traditional methods using computerized tomography (CT), magnetic resonance imaging (MRI), virtual colonoscopy, and capsule endoscopy. At the same time, algorithms based on AI (artificial intelligence), for example, using Convolutional Neural Network (CNN) models, have shown higher accuracy than the human eye in detecting changes in the gastrointestinal tract.

Among local scientists, Professor A.A. Egamberdiev and Associate Professor S.R. Rajabov's work highlights the issues of improving the quality of medical services in rural areas through the introduction of digital medical tools in the conditions of Uzbekistan. Their research emphasizes the importance of medical information systems in maintaining patient records, accelerating diagnosis, and increasing the effectiveness of treatment.

Also, several articles have noted that the risk of developing gastrointestinal diseases can be assessed in advance through predictive models based on artificial intelligence. This allows for timely preventive measures.

The scientific-analytical approach was taken as the basis for writing this scientific article. The main attention in the study was paid to the analysis of existing literature, to determine the role of modern computer technologies used in practice in medicine, especially in the diagnosis and treatment of gastrointestinal diseases.

Systematic approach - the existing methods of diagnostic technologies (CT, MRI, AI-endoscopy) were analyzed, and their clinical effectiveness and practical usefulness were assessed.

Comparative Analysis

The differences, advantages and disadvantages between traditional methods and methods based on modern computer technologies were compared.

Statistical Analysis

The results of technologies used in the healthcare system of different countries, as well as Uzbekistan, were considered based on digital data.

Empirical approach - practical examples were studied through real practice in medical institutions, interactive conversations, and open databases.

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Conclusion

The above analyses and scientific and practical research show that modern computer technologies are of great importance in the early detection, effective treatment and monitoring of gastrointestinal diseases. Computed tomography, capsule endoscopy, and diagnostic systems based on artificial intelligence not only increase the accuracy of diagnosis, but also allow for the personalization of the treatment process.

Through the introduction of medical information systems, the ability to accurately, systematically and quickly record clinical data about patients and analyze them has increased dramatically. In particular, artificial intelligence has opened a new era in medicine in terms of disease prognosis, risk factor assessment and preventive measures.

At the same time, the widespread introduction of these technologies is a requirement of the time for the medical system of Uzbekistan. Developing infrastructure, improving the skills of medical workers in using information and communication technologies, and adapting innovative methods to local conditions are among the urgent tasks.

In conclusion, the role of computer technology in gastrointestinal diseases not only simplifies diagnosis and treatment, but also serves as an important factor in improving the quality of medical care and the quality of life of patients. There is no doubt that future research and technological innovations in this area will take medicine to a new level.

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