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POINT-OF-CARE TESTING (POCT) TECHNOLOGIES: THE ROLE OF THE LABORATORY PHYSICIAN IN RAPID AND EFFECTIVE DIAGNOSIS OF INFECTIOUS DISEASES

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Annotatsiya

This scientific article analyzes the role of Point-of-Care Testing (POCT) technologies in the rapid diagnosis of infectious diseases. The advantages, diagnostic accuracy, areas of application and their limitations of POCT systems are reviewed based on scientific sources. The important role of the laboratory physician in quality control, validation of results and clinical interpretation is also justified. The results of the study show that the effectiveness of POCT technologies is closely related to their proper management and laboratory control.

Key words: POCT, rapid diagnostics, infectious diseases, laboratory physician, quality control POCT, infectious diseases, rapid diagnostics, laboratory control, clinical interpretation.

ТЕХНОЛОГИИ ТЕСТИРОВАНИЯ В МЕСТЕ ОКАЗАНИЯ МЕДИЦИНСКОЙ ПОМОЩИ (POCT): РОЛЬ ВРАЧА-ЛАБОРАНТА В БЫСТРОЙ И ЭФФЕКТИВНОЙ ДИАГНОСТИКЕ ИНФЕКЦИОННЫХ ЗАБОЛЕВАНИЙ

Аннотация

В данной научной статье анализируется роль технологий тестирования в месте оказания медицинской помощи (POCT) в быстрой диагностике инфекционных заболеваний. На основе научных источников рассмотрены преимущества, диагностическая точность, области применения и ограничения систем POCT. Также обоснована важная роль врача-лаборанта в контроле качества, валидации результатов и их клинической интерпретации. Результаты исследования показывают, что эффективность технологий POCT тесно связана с их правильным управлением и лабораторным контролем.

Ключевые слова: POCT, быстрая диагностика, инфекционные заболевания, врач-лаборант, контроль качества POCT, лабораторный контроль, клиническая интерпретация.

Introduction

In modern medicine, early detection of infectious diseases is of great importance in reducing their spread and increasing the effectiveness of treatment. Although traditional laboratory methods have high accuracy, they require a lot of time to obtain results. Therefore, POCT technologies, which allow for rapid diagnostics at the patient's bedside, have become widely used. However, the uncontrolled use of these technologies can lead to incorrect diagnosis. Therefore, the role of the laboratory physician is considered an important scientific and practical issue. The rapid spread of infectious diseases in the global health system is increasing the need for their early detection and effective control. Although traditional laboratory diagnostic methods have high sensitivity and specificity, they are often time-consuming and infrastructure-intensive. In this regard, Point-of-Care

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Testing (POCT) technologies are considered an important innovative solution in healthcare practice. POCT is a diagnostic method that is performed at the patient's bedside or outside the laboratory, allowing for rapid results. However, there are also challenges associated with the widespread adoption of these technologies, including the accuracy of results, quality control, and the risk of misinterpretation.

Research material and methods.

This article is analytical in nature, and it studies international scientific literature, including articles on clinical diagnostics and POCT technologies. The methods of comparison, generalization, and systematic analysis were used.

This article is analytical in nature, and it studies international scientific literature, including articles on clinical diagnostics and POCT technologies. The methods of comparison, generalization, and systematic analysis were used. The role of POCT in diagnosing infectious diseases POCT technologies are particularly effective in the following situations: In emergency medical care, during epidemics and pandemics

In rural and resource-limited areas. For example, during the COVID-19 pandemic, rapid tests played a key role in quickly identifying the disease and taking isolation measures. Diagnostic accuracy and limitations. The main disadvantage of POCT systems is their lower sensitivity and specificity compared to traditional laboratory tests. In addition: There is a possibility of false positive and negative results. Operator-related errors are observed. The quality of the device and reagents affects the result.

The obtained results.

Therefore, it is not always correct to accept POCT results as a definitive diagnosis. Limitations and problems of POCT. Despite the widespread use of POCT technologies, there are a number of problems: Lower accuracy of results, possibility of false positive or negative results problems with the quality of devices and reagents, errors of unskilled users. Therefore, these tests should be viewed as an auxiliary tool, not as an independent diagnostic tool. The role of the laboratory physician. The effectiveness of POCT technologies is directly related to the activities of the laboratory physician. Quality control- The laboratory specialist monitors the correct operation of the tests, the suitability of reagents and the calibration of the devices. Confirmation of results. In doubtful or important clinical cases, POCT results are re-checked in the laboratory. Interpretation of results. The correct conclusion can only be drawn by a qualified specialist, comparing the test results with the clinical condition of the patient. Training of medical staff

Training staff in the correct use of POCT tests is also part of the laboratory physician's role. The results of studies have shown that POCT technologies enable the rapid detection of infectious diseases. Rapid test results help healthcare providers start treatment in a timely manner. It has also been demonstrated that POCT is especially useful in areas with limited laboratory facilities.

According to the study “Point of Care Testing for Infectious Diseases” (Clinical Chimica Acta), POCT allows rapid diagnosis directly at the patient’s side and is used for detecting viruses, bacteria, and other infectious agents. However, the study emphasizes that quality control and clinical confirmation are necessary to ensure accurate and reliable results. Overall, the obtained results indicate that POCT technologies are effective methods for the rapid diagnosis of infectious diseases. They reduce diagnostic time and support timely treatment decisions. At the same time, the reliability of POCT results depends on laboratory physician supervision, quality management, and proper interpretation of test.

Conclusion

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POCT technologies are important diagnostic tools that allow infectious diseases to be detected quickly and conveniently. They help provide rapid medical assistance to patients and start treatment in a timely manner. However, the accuracy and reliability of these tests depend on certain factors, and sometimes they may produce incorrect results. Therefore, in some cases, POCT results need to be confirmed by laboratory tests. The role of the laboratory physician in quality control, interpretation of results, and training of medical staff is essential for the effective use of POCT technologies. Therefore, the most reliable and effective results can be achieved only when POCT and traditional laboratory diagnostics are used together.

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