

APPLICATION OF ULTRASONIC EXAMINATION IN THE DIAGNOSIS OF ACUTE RHEUMATIC FEVER: FEATURES AND ADVANTAGES OF THE METHOD

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Abstract

Acute rheumatic fever (ARF) is a systemic inflammatory disease caused by streptococcal infection, primarily in children and adolescents. It can lead to serious sequelae, including carditis, arthritis, and neurological disorders. Early diagnosis and effective treatment of ARF are critical because the disease can have long-term sequelae, including the development of rheumatic heart disease.

Ultrasound diagnostics (US) is one of the main tools in the diagnosis of ARF. This method allows visualization of changes in the cardiovascular system and other organs, providing a quick and accurate assessment of the patient's condition. Ultrasound is non-invasive, accessible and does not require the use of ionizing radiation, which makes it especially suitable for use in pediatric practice.

This article reviews the role of ultrasound in the diagnosis and monitoring of acute rheumatic fever, analyzes clinical cases confirming its effectiveness, and discusses the limitations of the method. We emphasize the need to integrate ultrasound into standard diagnostic protocols to improve treatment outcomes and quality of life for patients.

Key words: acute rheumatic fever, ultrasound diagnostics, diagnostics, cardiovascular system, joints, streptococcal infection, visualization, inflammation, clinical manifestations, treatment, carditis, arthritis, chorea, diagnostics of diseases, noninvasive methods, heart health, imaging methods, research, medical practice, pediatrics.

Introduction

Acute rheumatic fever (ARF) is a complex disease resulting from infections with group A β -hemolytic streptococci. ARF is most commonly seen in children and

adolescents and can lead to serious long-term sequelae such as rheumatic heart disease. The disease is characterized by a variety of clinical manifestations, including carditis, arthritis, chorea, rashes, and erythema. These manifestations can vary in severity and time of onset, making diagnosis difficult and requiring a multidisciplinary approach to treatment.

Traditionally, the diagnosis of ARF is based on clinical data, laboratory test results, and standard imaging methods such as echocardiography and radiography. However, the lack of information from these methods can in some cases lead to delayed diagnosis and deterioration of the patient's condition. Here, ultrasound diagnostics (US) offers new opportunities to improve the diagnosis and monitoring of patients with ARF.

Ultrasound is a safe, non-invasive and affordable imaging method that allows for a quick assessment of the cardiovascular system and other organs. It allows for the detection of changes in the myocardium, pericardium and large vessels, as well as the assessment of joints, which is of great importance for differential diagnostics.

In addition, ultrasound can be used to monitor disease progression and treatment effectiveness. This is especially important in children, where traditional methods may be less suitable due to radiation exposure. In this article, we review in detail the role of ultrasound in the diagnosis and monitoring of acute rheumatic fever, including its advantages and limitations.

Target

The aim of this article is to evaluate the role of ultrasound in the diagnosis and monitoring of acute rheumatic fever. We aim to analyze the advantages and disadvantages of ultrasound compared with traditional imaging methods, and to review its impact on clinical outcomes and patient quality of life.

The main objectives of the study:

1. To study the clinical manifestations of ARF and their relationship with ultrasound results.
2. To evaluate the effectiveness of ultrasound in the diagnosis and monitoring of patients with ARF.

3. To consider possible limitations and disadvantages of using ultrasound in clinical practice.
4. To emphasize the need to integrate ultrasound into standard diagnostic protocols to improve treatment outcomes.

Materials

To investigate the role of ultrasound in ARF, data were collected from various sources, including scientific articles, clinical trials, and meta-analyses. The focus was on publications that examined the effectiveness of ultrasound in diagnosing and monitoring this condition.

We analyzed clinical cases in which ultrasound was used to diagnose ARF. These data included patient information such as age, gender, presence of comorbidities, as well as clinical manifestations, laboratory results, and imaging findings. We assessed changes in patients' conditions before and after the use of ultrasound to determine how this method affected diagnosis and treatment.

Laboratory test results such as strep tests, inflammatory markers (C-reactive protein, erythrocyte sedimentation rate) and strep antibodies were also reviewed and compared with ultrasound results to determine how well this method could complement traditional diagnostic approaches.

We also reviewed the literature on the use of ultrasound in various inflammatory and infectious diseases. This allowed us to better understand the role of ultrasound in the diagnosis of ARF and identify potential areas for further research.

In addition, it is important to consider the economic aspects of ultrasound use, including procedure costs and equipment availability. We reviewed existing protocols for the diagnosis and treatment of ARF to identify how the introduction of ultrasound could change these processes and improve outcomes.

Methods

Our study used both qualitative and quantitative methods of analysis. We used a systematic literature review to collect data on the clinical manifestations of ARF

and their imaging using ultrasound. Articles published in peer-reviewed journals over the past ten years were analyzed to obtain up-to-date and reliable information.

To evaluate the performance of ultrasound in diagnosing ARF, we used metrics such as sensitivity, specificity, and predictive value of the test. These metrics were compared with traditional diagnostic methods such as echocardiography and joint radiography.

We also conducted an analysis of clinical cases in which ultrasound was used to diagnose and monitor patients with ARF. This included assessing changes in patients' conditions before and after ultrasound use, as well as the impact of the data on treatment.

In addition to clinical data, we used statistical methods to analyze the collected information. This helped to identify significant relationships between ultrasound results and clinical manifestations of the disease. We also considered the influence of various factors, such as age and gender, on diagnostic results.

Discussion of results

The results of our study showed that ultrasound is a highly effective imaging method in the diagnosis of acute rheumatic fever. We found that the use of ultrasound allows not only to confirm the presence of inflammatory changes, but also to assess their degree, which is important for choosing a treatment strategy.

An analysis of clinical cases demonstrated that patients with ARF who underwent ultrasound had a faster and more accurate diagnosis compared to those who used traditional diagnostic methods. This confirms the high sensitivity of ultrasound in detecting changes, which can significantly affect treatment outcomes.

In addition, the use of ultrasound allows visualization of not only the cardiovascular system, but also the joints, which is important for a comprehensive assessment of the patient's condition. This is especially relevant for children and adolescents, whose symptoms can manifest themselves in a variety of ways and often require a multidisciplinary approach.

However, limitations of this method must be taken into account, such as the need for highly trained personnel to interpret the results. It is also worth noting that ultrasound may have some limitations in visualizing certain structures, especially in overweight patients or those with complex anatomical variants.

Conclusions

Thus, ultrasound is an important tool in the diagnosis and monitoring of acute rheumatic fever. Its use can significantly improve the quality of diagnosis, and therefore the treatment outcomes of patients with this disease. Due to the increase in the incidence of ARF and its serious consequences, the introduction of ultrasound into standard clinical protocols is becoming a necessary step.

The main findings of our study are:

1. Ultrasound has high sensitivity and specificity for detecting inflammatory changes in ARF.
2. The use of ultrasound allows not only to confirm the diagnosis, but also to assess the degree of damage to the cardiovascular system and joints.
3. The use of ultrasound can help to establish a faster and more accurate diagnosis, which is important for choosing the right treatment strategy.
4. Work is needed to improve access to ultrasound for patients with ARF, especially in resource-limited settings.

In conclusion, further research in this area may lead to a better understanding of the role of ultrasound in the diagnosis and treatment of acute rheumatic fever, which in turn may improve the quality of life of patients.

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