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THE INFLUENCE OF PHYSIOTHERAPY ON THE X-RAY PRESENTATION OF RHEUMATOID ARTHRITIS IN CHILDREN

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Abstract: The paper presents the results of analyzing the radiological symptoms over the course of treatment in 426 patients at the end of a one-month physiotherapy course and at 3-6 and 12 months post-treatment. The study showed that rapid changes in the X-ray picture of rheumatoid arthritis (RA) during treatment could only be observed in the anterior upper fold of the knee joint, where changes in the amount of synovial fluid have their radiological reflection. Additionally, the heterogeneous density of the content of the fold allows conclusions about recurrences of inflammation, especially when compared with clinical and laboratory data on the degree of its activity.

Keywords: rheumatoid arthritis, X-ray presentation, physiotherapy, children.

Introduction: The determination of the stage of rheumatoid arthritis (RA) primarily relies on radiological methods, which objectively assess the condition of bones, articular cartilage, and periarticular soft tissues, as well as accurately determine the localization and extent of the process. Accepted radiological signs of the disease include osteoporosis, narrowing of joint spaces, periarticular (marginal) and intra-articular bone destruction, and bone ankylosis. The latter sign is unequivocally regarded as an indication of the disease's particular severity. Another sign described in the literature is the thickening and deformation of soft tissues. This symptom is detailed only by N.S. Kasinskaya in radiological literature.

Materials and Methods: An analysis of all listed symptoms was conducted on 426 patients with rheumatoid arthritis (RA) at the end of a one-month physiotherapy course and at 3-6 and 12 months post-treatment. Radiological examinations were performed on wrists, feet, knees, elbows, and shoulder joints, depending on the clinical manifestations of the disease. The following radiological investigation techniques were used: standard radiography with intensifying screens and non-screen radiography with direct image magnification by 5-7 times. These techniques allowed for the study of bone structure, thickness of articular cartilage, and periarticular soft tissues. Special techniques such as radiography of the distal parts of the feet in the dorsal position and a special device for positioning the feet at different angles and beam bundles were used to obtain optimal joint images, enabling visualization of all interphalangeal joints. Lateral radiography of the knee joints was performed with mandatory inclusion of the distal third of the femur to assess the condition of the anterior upper fold of the joint. Examination of the ankle joint in the anteroposterior projection was performed with the foot rotated inward by 15-20 degrees to visualize the joint space throughout its length. Radiography of the interphalangeal joints of the hands with direct image magnification was performed using the REIS-D apparatus.

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Results and Discussion: Analysis of all radiographs showed that after one month of physiotherapy and during the subsequent 3-6 months of observation, no visual changes in bone structure (osteoporosis, destruction) or thickness of articular cartilage were detected. As for the two symptoms of changes in soft tissues and bone ankylosis, their dynamics and significance require special discussion. Despite the clinical observation of a decrease in the thickness of soft tissues around the interphalangeal joints of the hands during physiotherapy, these changes could not be detected on standard radiographs, neither after a month of treatment nor during the following 3-4 months of observation. It was expected to obtain more definite results on the thickness of soft tissues around the interphalangeal joints from radiographs with direct image magnification. However, using this technique, a decrease in the thickness of periarticular soft tissues during physiotherapy could only be observed after 10-12 months following clinical remission of the process. Radiological examination of different areas revealed that the most demonstrative changes in soft tissues could be seen in knee joints in case of their involvement. Thus, the condition of the anterior upper fold should be studied carefully.

The anterior upper fold of the knee joint is a cavity lined with synovial membrane, located in front of the femur at the level of its lower third and connected to the joint space. In normal conditions, on X-rays of the knee joint in lateral projection, the anterior upper fold appears as a uniform lucency, bounded anteriorly by the quadriceps muscle and posteriorly by the femur. The condition of the anterior upper fold reflects changes within the joint itself. For example, during inflammatory processes in the joint, synovial fluid accumulates, which may not always be clinically evident on X-rays. In such cases, darkening of the anterior upper fold is observed, and significant accumulation of fluid results in its enlargement, leading to anterior displacement of the quadriceps muscle and a uniformly convex shape of the fold's anterior wall. As the amount of fluid in the joint decreases during treatment, the radiological appearance of the anterior upper fold changes, with a reduction in its size and increased transparency. During inflammatory recurrences, the size and density of the fold increase again, and in cases of proliferative inflammation, denser areas of infiltrates may persist after fluid reduction. This heterogeneous density pattern of the anterior upper fold also develops after multiple disease recurrences, reflecting not only proliferative areas but also the uneven organization of the fold's contents.

Determining the activity of inflammation is achieved by correlating radiological images with clinical and laboratory data. Another symptom, bone ankylosis, is considered by clinicians as an indicator of particularly severe disease. Bone ankylosis is rare in RA. Among the 426 patients examined, bone ankylosis was found in 65 joints of 31 patients, mostly in hand joints and only in one knee joint. In 18 patients, active disease was clinically and radiologically evident in other joints. These observations led to the recognition that some reservations should be made regarding the symptom of bone ankylosis. True bone ankylosis can only occur when there is complete destruction of articular cartilage and bone destruction of joint sections, which only happens in particularly aggressive RA. However, the replacement of cartilage and bone destruction by the process of new bone formation, necessary for bone fusion, can only occur when active inflammation transitions to a quiescent stage. The detection of bone ankylosis indicates that firstly, the process did not proceed aggressively, and secondly, it passed through a quiescent stage, which may still be ongoing at the time of

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examination. The persistence of this quiescent stage can be judged by the nature of the bone structure of the entire area of the former joint. If new bone trabeculae have formed against the background of osteoporosis typical of RA, this indicates a sufficiently stable quiescence of local inflammation. Noticeable regenerative restructuring in RA may only be detected 8-12 months after the onset of quiescence of the process.

Conclusion: Our research has shown that rapid changes in the radiological picture of RA during treatment can only be observed in the anterior upper fold of the knee joint, where changes in the amount of synovial fluid have their radiological reflection. Additionally, the heterogeneous density of the fold's content allows for conclusions about recurrences of inflammation, especially when correlated with clinical and laboratory data on the degree of its activity. Joint ankylosis is not an indicator of disease severity at the time of examination but rather indicates complete destruction of articular cartilage at that site, contact bone destruction of articulating bones, and the transition of the disease to a quiescent stage, during which bone fusion occurs.

Literature:

1. Astapenko, M.G. "Infectious Non-specific Polyarthritis." Moscow, 2006, pp. 22-26.
2. Mylov, N.M. "Rheumatoid Arthritis." Moscow, 2003, pp. 134-138.
3. Tareev, E.M. "Rheumatoid Arthritis." Moscow, 2007, pp. 51-54.
4. Tsongev, T. "Rheumatology." Sofia, 2005, pp. 378-386.