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Comparison of X-Ray and Morphological Changes in Pulmonary Sarcoidosis

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Abstract: This study consists in the study of radiological and morphological changes in sarcoidosis of the respiratory organs. The study involved 60 patients aged 25 to 65 years. The analysis of radiological manifestations of sarcoidosis was evaluated by the main indicators (symmetry of the lesion, size of the intra-thoracic lymph nodes, the presence of dissemination, pneumofibrosis). An extensive morphological study of biopsy samples with the study of quantitative and qualitative composition was carried out. . Changes in lung parenchyma and enlargement of mediastinal lymph nodes were detected in all patients of stage I-III. The components of the cellular elements of the inflammatory infiltrate did not differ at different stages of sarcoidosis.

Keywords: sarcoidosis, diagnosis, morphological structure of granuloma, stages of irradiation.

Relevance. Sarcoidosis is a common systemic inflammatory disease of unknown origin and has many clinical masks: from asymptomatic to severe damage to various organs and systems [11]. It is known that granulomatous inflammation is characteristic of sarcoidosis, which occurs under the influence of factors of the external and internal environment, which have an antigenic nature in a hereditary sensitive organism [7, 13, 15]. The diagnosis of sarcoidosis is based on radiation and histological research methods, as well as the clinical experience of specialists in various fields [5]. Structural features and Radiological signs of granulomas in various variants of the respiratory sarcoidosis (RS) course have been studied in sufficient detail in the literature [3, 6]. Radiation imaging techniques play an important role not only in diagnosis, but also in assessing the clinical course and outcomes of ODS, as well as deciding on therapeutic tactics in the treatment of the patient [2] (e.g., Phase I sarkaidosis is associated with tuberculosis and lung diseases.Considering the introduction of histological methods in the diagnosis of sarcoidosis and the expansion of the possibilities of radiative research methods through computed tomography (CT) , there is a need to look for new approaches to the classification of sarkaidosis to determine the patient management algorithm. In recent years, several scientific works have appeared on the evaluation of morphological indicators and their compatibility with radiological signs of sarkaidosis [1, 4, 8]. The median age of patients at the onset of the disease was 38 years. During the examination, complaints, medical history of the disease, including professional history and X-ray data (chest X-ray in 2 projections, chest (CT) were studied. In the analysis of X-ray manifestations of sarcoidosis, the following were evaluated: symmetry of the lesion, size of intrathoracic lymph nodes (HTLU), size of distribution with size of lesions and foci, affected areas, presence of injury sites, calcifications, cyst changes, pneumofibrosis, emphysema and pleural sheaths. In the distribution of patients by radiological stages, J. Modified by Skadding and recommended by the 2014 Federal consensus clinical guidelines.Stages under the Wurm classification:

0-No changes in chest X-ray (pulmonary sarcoidosis);

Stage I-VLN lymphadenopathy, pulmonary parenchyma unmodified;

Stage II-lymphadenopathy of the upper lymph nodes, pulmonary parenchyma

pathological changes;

Stage III-pathology of pulmonary parenchyma without VLN lymphadenopathy,

Stage IV-irreversible pulmonary fibrosis.

Materials and methods.Biopsy samples to all patients with a pathomorphological examination, a videotoracoscopy was performed with a targeted biopsy of the affected area of the lung and intraocular lymph nodes. The diagnosis of sarkaidosis in all patients is histologically confirmed. Histological examination studies the quantitative composition of the biopsy sample. In accordance with the generally accepted method of visual microscopy, the total number of cells was calculated in 10 visual fields at 100X magnification. In visual fields, the number of granulomas, large cells, macrophages, lymphocytes, neutrophils and eosinophils was studied. Studies its other morphological composition in biopsy samples. In accordance with the generally accepted method of visual microscopy (Leica DM 3000 microscope), the total number of cells was calculated at 100X magnification over 10 fields of view. In visual fields, the number of granulomas, large cells, macrophages, lymphocytes, neutrophils and eosinophils was studied. The presence of other morphological formations in biopsy samples was qualitatively assessed: hyalinosis, Shauman bodies, necrosis, stamping, calcification, fibrosis and vasculitis. Calcification and vasculitis are very rare in biopsy samples - 2/121 (1.7%) cases, no fibrosis was detected in any case, and therefore the parameters listed in subsequent calculations were not taken into account. Statistical data processing Statistica 10 program statistical calculations include linear Spearman correlation analysis, Association analysis, and Intergroup difference analysis. Comparisons of groups were examined using the non-parametric Mann-Whitney test, averaging values, mean error, upper and lower quartiles were calculated, with a non-parametric analysis of the reciprocal tables with the Pearson surprise case test calculation. , if the expected event received a value from 5 to 9, The X - Square test was calculated by Yates ' correction. If the expected effect was less than 5, Fisher's exact test was used for analysis. The strength of the correlation has been described as weak (R 0.18 to 0.26; direct mean (R 0.28 to 0.44); inverse weak (R -0.18 to -0.26); inverse mean (R -0.28 to -0.44). The differences were considered to have statistical significance at $p < 0.05$. The results of the study revealed the following distribution of 60 patients by radiological stages (J. Vurm classification modified by Skadding): stage 0 - 0, Stage I - 36 (29.8%) people, Stage II - 79 (65.3%), stage III – 6 (4.9%), stage IV – 0%. Patients with Stage II of the disease dominated. According to the literature, stage 0 incidence is 8-16% and Stage IV is about 5%. Acute sarcoidosis in the form of the Lefgren symptom complex has been reported in 10 of 60 patients (6.3%). . In most cases, the disease was primarily in the chronic stage.

Results and conclusions. Analysis of the results obtained showed that a complex radiological study (chest X-ray and chest CT in 2 projections) revealed changes that are characteristic not only of certain radiological stages of the disease. Thus, 50 tuberculosis and lung diseases lymphadenopathy have been observed in all stages of sarkaidosis, but in I and II it is moderate or noticeable - VGLU more than 3 cm, and in Phase III in all cases. There was a slight increase to 1.5 cm. Phase I patients were diagnosed with a single calcification of the lungs and several lesions with "ground glass" zones. In patients with Stage II and III, focal shadows were detected against the background of interstitial changes. With the development of the disease, the foci were combined with the formation of conglomerates of soft tissues and the development of local fibrosis. No ground glass zones have been recorded in Phase III. At variable frequencies, pleural sheaths were observed in all radiographic stages. . X-ray changes detected in the lungs and lymph nodes in stages I and II of the disease are mostly bilateral, with asymmetry of the injury observed in Stage III. A comparison of morphological examination data was carried out at

different radiological stages of sarkaidosis (Table 2). In general, the cellular composition of inflammation did not differ in infiltrate at different stages of sarkaidosis and was expressed by lymphocytes, macrophages, giant cells, neutrophils and, more rarely, eosinophils, which corresponds to literature data. However, as the stage became more severe, the number of granulomas increased, as evidenced by the direct correlation between the number of granulomas in the biopsy sample and the Radiological stage ($R = 0.24$; $p < 0.05$). In addition, with the intensification of the Radiological stage, the susceptibility of granulomas to necrosis increases ($R = 0.39$; $p < 0.05$) . With sarcoidosis, the development of Central necrosis is observed in 35% of cases. However, neutrophils can be detected at the beginning of the appearance of necrosis, ischemic necrosis can develop when the cavity of the vein is closed with granulomas.

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