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Prediction of Radiographic Progression of Ankylosing Spondylitis

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Abstract: Relevance. To date, early diagnosis of ankylosing spondylitis (AS) is being studied using radiological signs of the disease and predicting its radiological development is considered one of the urgent problems.

Objective. To study radiological progression predictors in patients with AS

Materials and methods. The study included 60 patients with AS whose diagnosis was confirmed with the modified New York criteria of 1984. The participants were divided into two groups. The first group included 30 participants who identified early signs of AS, and the second included 30 patients with late signs of AS. MRI and X-ray studies of the sacroiliac joints and spine were performed to assess structural changes. All participants collected venous blood to determine the HLA-B27 gene, CRP, and ESR. In addition, BASDAI, ASDASCRP, ASDASESR and mSASSS were evaluated in both groups.

Results. The average duration of the disease was 11,2 years in group II and 7,8 years in group I. Approximately 96% of patients' spine was found with at least one syndesmophyte by x-ray in the second group. At the same time, signs of active inflammation in the spine in patients of group I: osteitis, shiny angles, and erosion were observed relatively often. The mean mSASSS was 8 ± 1.4 in group I and 21.0 ± 2.21 in group II ($p < 0.05$).

Conclusion. The detection of high values of the mSASSS index in patients with AS indicates that radiological signs of the disease can progress than with low values of mSASSS. In addition, radiographic evidence of bilateral or unilateral sacroiliitis stage III and above indicates that at least one syndesmophyte may be found in the spine.

Keywords: ankylosing spondyloarthritis, mSASSS, x-ray, C-reactive protein, erythrocyte sedimentation rate, MRI.

Ankylosing spondylitis (AS) is a chronic inflammatory rheumatological disease which affects the spine, sacral-iliac joints, as well as large joints. It is also referred as axial spondyloarthritis, it is a Chronic inflammatory back pain is the main symptom of the disease. The peculiarity of the disease is that AS mainly affects middle-aged men. The role of the HLA-B27 gene in the development of AS and the course of the disease is of particular importance. However, the main indicator in the diagnosis of AS is not this gene, but radiological methods. To date, early diagnosis of the disease is studied using radiological signs of AS and forecasting its radiological development is considered one of the urgent problems.

AS is a chronic inflammatory disease in contrast to other spondyloarthropathies, which are caused by the growth of syndesmophytes formed in the spine and sacroiliac joint (CPS). Patients are concerned about the characteristic inflammatory dull pain in the lumbar region, which is the main symptom of the disease. These inflammatory pains begin in the second half of the night and are the main symptom causing suffering to patients. As structural changes develop, the volume of movements in the spine of patients and the risk of physical activity restriction are reduced. It is known that as structural changes develop, the quality of life of patients decreases. Depending on the activity of the disease and the stage of the inflammatory process, with the use of therapeutic measures, the development of disability can be prevented by reducing structural changes developing in patients.

The formation of syndesmophytes and ankylosis in the spine are the main structural changes characteristic of AS. Structural changes in the spine and in the sacroiliac joint are determined by radiological examination [1,6]. It should be noted that osteodestructive changes are less typical for AS disease, but bone damage, i.e. erosion, is a characteristic feature.

To date, there are several criteria for assessing structural changes in the AC, one of which is the BASRI assessment criteria. This criterion radiologically evaluates the sacroiliac joint in the anterior-posterior, lumbar spine in the anterior and lateral parts, cervical spine in the lateral spine [2,4,5]. The Stoke AS (the Stoke Ankylosing Spondylitis Spinal Score-SASSS) assesses changes in the anterior-back corners of the lumbar vertebrae. In the modified SASSS (mSASSS) criteria, the lumbar spine is X-rayed at the front and side, and the cervical spine is only viewed from the side. In addition, RASSS is one of the new methods of assessing radiological criteria, and in addition to the criteria for evaluating mSASSS, its structure includes the lower parts of the thoracic spine Th10-Th12, the growth of the new bone is observed and evaluated [3,7]. However, these criteria have their drawbacks. For example, in the BASRI, SASSS and mSASSS criteria, the main reason for the lack of thoracic vertebrae in the criteria is technical complexity, and the reason for this is the location of the lungs on the survey radiograph.

Observing structural changes in the spine, it is possible to adequately assess the effectiveness of the treatment of AS disease.

Today, assessing the structural development of AS, it is possible to monitor the further development of the disease, as well as the effectiveness of treatment measures.

Material and methods. The study was conducted in the period from 2020-2023 in the departments of rheumatology, cardio-rheumatology and RRM and IADK of the multidisciplinary clinic of the Tashkent Medical Academy treated 60 patients, whose diagnosis is fully confirmed by diagnostic criteria that met the modified New York criteria of 1984. Patients were divided into two groups depending on the stage of the disease: the 1st group included patients with an early stage of the disease, the 2nd group included patients with a pronounced and late stage. The following criteria were used to divide patients into groups: patients included in the early stage were patients with bilateral sacroiliitis according to Kellgren stage I and II, determined in the radiological study of the sacral-iliac transition, patients with bilateral or unilateral sacroiliitis of stage III and IV were included in the late and pronounced stage. All patients underwent X-rays of the spine and sacral-iliac transition, MRI examination. The results of the X-ray

examination were evaluated according to mSASSS criteria. In the groups, spinal column changes on the mSASSS scale were evaluated as follows: vertebral body unchanged-0 points, wound, sclerosis, quadrapoint, growing syndesmophytes-2 points, with fully fused syndesmophytes of the 3-point bridge. The mSASSS indicator is estimated in the range of 0-72. The higher the accumulated score, the more pronounced and irreversible the structural changes in the spine are. At the same time, the erythrocyte subsidence rate, the content of C-reactive protein and the presence of the HLA-B27 gene were also determined using venous blood taken from patients. BASDAI, ASDASECHT and ASDASCRO indices were used to determine the clinical activity of AS. The BASDAI questionnaire, consisting of 6 questions and the amount of ESR and CRP, was used to calculate the ASDASCOE and ASDASSRB indices. In addition, all participants filled out a specially developed questionnaire. The questionnaire consisted of questions about the age of the disease, at what age it began, from what joint and the first symptoms. The results have been statistically processed.

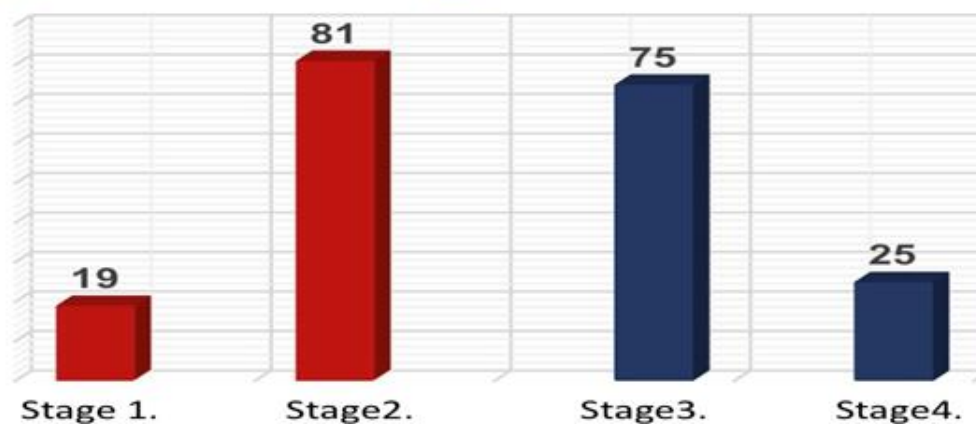
The study involved patients over 18 and under 60 years of age with clear radiological signs of AS. The study involved patients with cardiovascular, kidney and liver diseases, severe and extremely severe disease, as well as AS disease, but as an exception, pregnant women were excluded from the study.

Results. When analysing the results by groups, the average age of patients in group I was 38 years (max-min: 24-42), and in group II - 44.5 years (max-min: 33-56). From the result obtained, we can say that the age of group II was 1.17 times that of group I. The average duration of the disease is 11.2 years in group II and 7.8 years in group I.

MRI examination of the sacral-iliac joint showed signs of osteitis in the active stage of the disease in patients of both groups. Symptoms of osteitis were found in 43.3% of group I patients and 27% of group II patients. 71.7% of all patients have symptoms of unilateral osteitis. In most cases, signs of osteitis or erosion in CPS were found in the lower 1/3 of the transition.

The HLA-B27 gene occupies a special place in the clinical picture of AS, as well as in its phenotypic manifestations and genetic predisposition. HLA-B27 gene was detected in more than 78% of patients who participated in our study. However, it is known from observations that as the duration of the disease increases, the frequency of structural changes in the disease in patients also increases. Thus, in our study, the duration of the disease in group I was 2.1 times shorter than in group II. The main factor in the appearance of structural changes is the duration of the disease.

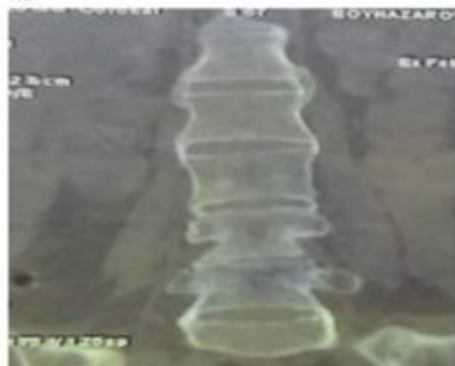
❖ Figure-1. Correlation of stages of sacroiliitis in groups
■ Group 1. n=30%. ■ Group 2 n=30%



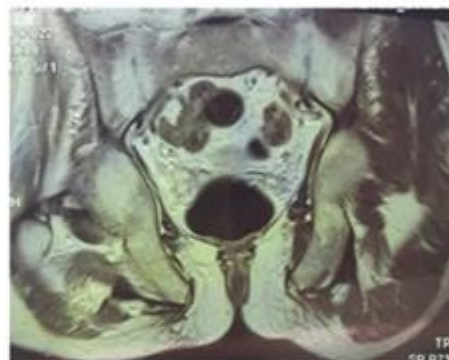
In the assessment of structural changes in AS, X-ray examination is one of the most sensitive methods of examination. In the X-ray examination of the spine of patients, the frequency of at least 1 syndesmophytes

was about 96% in group II. At the same time, signs of active inflammation in the spine in patients of group I: osteitis, shiny angles, injuries were observed relatively often (Fig. 3, 4). The study found that the most common syndesmophyte sites in the spine are C5-C6-C7, Th11-Th12 and L1-L2-L3-L4-L5. The X-ray of the anterior spine revealed symmetrical graceful syndesmophytes characteristic of AS disease. In addition, growing syndesmophytes without bridges have been identified. In the thoracic spine, the edges of the vertebral bodies were characterised by syndesmophytes without a bridge.

Figure 3



A. Symmetrical syndesmophytes in anterior-posterior radiograph vertebrae.



B. Bilateral sacroiliitis stage 4.

Figure 4

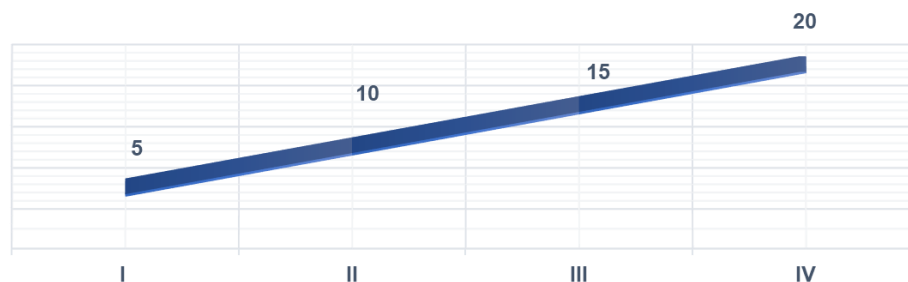


A. MRI studies of shiny angles in the sacrolumbar vertebrae.



B. X-ray of vertebrae of the spinal region with visible tender syndesmophytes

Table 1. Duration of the disease and frequency of occurrence of Syndesmophytes in patients with AS		
Indicators	I group	II group
Duration of illness, year	8,61±1,36	18,0±4,50*
Frequency of occurrence of syndesmophytes (at least 1 syndesmophytes), %	0	96%
mSASSS	8±1,4	21,0±2,21*
p<0,05		

Figure 2. Stages of sacroiliitis by disease duration (years)

The average mSASSS was 8 ± 1.4 in group I and 21.0 ± 2.21 in group II, and these indicators were statistically significant (Table 1). The higher the mSASSS, the higher the structural changes in the spine and signs of inflammation, such as osteitis, shiny angles, injuries, are expressed. In addition, the decrease in the mSASSS index after treatment is also a factor indicating the effectiveness of the chosen treatment method.

When studying the duration of the disease and the stages of sacroiliitis in patients, it was established that the shorter the duration of the disease, the lower the stages of sacroiliitis may be (Fig. 2).

It was noted that the duration of the disease in groups increased by 10 years, cases of sacroiliitis III and above stage may increase sharply. This, in turn, proves that the duration of the disease plays a special role in the structural development of AS disease. It should be noted here that the presence or absence of HLA-B27 in patients may not play an important role in structural development.

Table 2. Laboratory signs of inflammation		
Indicators	I group n=30	II group n=30
ESR mm/h	$28,2 \pm 2,6$	$17,1 \pm 1,35^*$
C-RP mol/l	$30,2 \pm 3,15$	$18,4 \pm 2,4^*$
BASDAI ≥ 4	$5,18 \pm 0,45$	$4,23 \pm 0,14^*$
ASDAS-C-RP	$2,8 \pm 1,17$	$2,6 \pm 1,24$
ASDAS-ESR	$2,8 \pm 0,1$	$2,6 \pm 0,02$
$p < 0,05$		

It is known that the inflammatory process in AS is permanent. It was found that the markers of inflammation were higher than normal in both groups. However, these indicators were clearly higher in group I, and these indicators have become statistically significant. Even when studying the clinical activity of the disease with BASDAI, it was noted that the activity was 5.18 ± 0.45 in group I and statistically significantly exceeded group II. However, despite this, the difference in ASDASESS and ASDASSRB indicators in both groups was similar to other indicators of inflammation, but these indicators did not reach statistical significance.

Discussion. This study compared the early and late stages of AS. It is known from the studies that the presence of the HLA-B27 gene and the presence of pronounced and deep symptoms of sacroiliitis on MRI are attributed to a very high radiological progressive risk of developing AS compared to patients who do not have this gene and have unexpressed symptoms of sacroiliitis [4]. Our study does not study radiological signs in the presence of the HLA-B27 gene, but noted an increase in the development of structural changes with an increase in the duration of the disease in patients. Due to the increase in the duration of the disease by 10 years in the X-ray examination of patients, it is possible to determine at least II and above stages of radiological sacroiliitis in SICH.

When diagnosing AS using ASAS or New York diagnostic criteria, the main diagnostic criterion is the detection of signs of sacroiliitis in SYCH. However, it is known from scientific studies that when observing the development of AS in the spine, a new ossification is radiologically observed, i.e. the growth of syndesmophytes [5.6]. Radiological progression of AS can be estimated using the mSASSS index or the syndesmophyte counting method [7]. In our study, we used the mSASSS score index using MRI and X-ray examination of the spine. The results showed that the higher the mSASSS index, the higher the structural changes. At the same time, the mSASSS index was observed high in group II and was statistically significant.

Thus, we can observe that the manifestation of structural changes in AS is inextricably linked to the duration of the disease. In the early stages of the disease, due to the prevalence of the inflammatory process, patients have a significant increase in inflammatory markers, and in the late stage, when structural changes in the spine and HIV are manifested by the growth of syndesmophytes or the appearance of a new ossification process, it has been established that in the late-stage inflammatory markers may lose their priority. Thus, at an early stage of AS, inflammation is a priority, and at a late stage - the process of ossification. At the III and higher stages of sacroiliitis in AS, at least one syndesmophyte can be observed on the spine.

Conclusion: Detection of high mSASSS index in AS patients indicates that radiological signs of the disease can progress than with low mSASSS indicators. In addition, X-ray detection of bilateral or unilateral sacroiliitis of stage III and above indicates that at least 1 syndesmophyte can be detected in the spine.

LITERATURE:

1. Akhmedova, I. M., & Khudayberganova, N. Kh. (2022). Extragastric manifestations of chronic gastroduodenitis in children.
2. Khudayberganova, N. Kh., Akhmedova, I. M., & Alikulov, I. T. (2024). The problem of clinical pathogenicity of helicobacter pylori in gastroenterology (Review).
3. Khudayberganova, N. Kh., Azadaeva, K. E., & Alikulov, I. T. (2023). Determination of Nutrition-Dependent Micronutrient Deficiencies Among School-Age Children.
4. Khudayberganova, N. Kh., Nurmetov, Kh. T., & Khaidaraliev, S. U. (2024). To assess the incidence of iron deficiency anemia and helicobacter pylori infection among school-age children with chronic gastroduodenal pathology. Khudayberganova, N. Kh., & Alikulov, I. T. (2023). Helicobacter Pylorosis in Children: Features of Diagnosis and Treatment. *European Science Methodical Journal*, 1(9), 23-28.
5. Khudayberganova, N. Kh., Rakhmatullaeva, G. K., & Alikulov, I. T. (2023). Helicobacter pylori infection and principles of therapy in children.
6. Mirakhmedova, Kh. T., Nigina, B., Narziev, N. M., & Alikulov, I. T. (2023). General Examination of the Patient (General Condition of the Patient, Consciousness, Position, Physique). Examination by Parts of the Body: Head, Face, Neck, Limbs, Skin Integuments.
7. Salaeva, M. S., & Khudayberganova, N. Kh. (2015). The relationship between social factors and quality of life parameters in patients with chronic obstructive pulmonary disease. *Bulletin of KSMA named after. IK Akhunbaeva*, (3), 74-79.