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АНКИЛОЗДУК СПОНДИЛОАРТРИТ МЕНЕН ООРУГАНДАРДЫН ОМУРТКАСЫНЫН ЭН ИРИ ЖАБЫРКАГАН АЙМАКТАРЫ

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Изилдөөнүн максаты

Анкилоздоочу спондилоартрит (АС) менен ооругандардын омурткасы боюнча абдан тартылган аймакты баалоо.

Материалдар жана методдор

Изилдөө 2020-2023-жылдары Ташкент медициналык академиясында жүргүзүлгөн. Изилдөөгө Нью-Йорк (1984) критерийлерине туура келген 18 жаштан 60 жашка чейинки 100 бейтап катышкан. Бардык катышуучулардын демографиялык жана клиникалык маалыматтары топтолгон, лабораториялык анализдер (эритроциттердин седиментация ылдамдыгы - ЭСЫ, С-реактивдуу протеин, HLA-B27) жана инструменталдык изилдөөлөр (омурткалардын, илиосакралдык муундардын рентгени, МРТси) аткарылды. Омурткада, омурткалардын алдыңкы-жогорку жана алдыңкы-төмөнкү капталдары АС боюнча кандайдыр бир жаракалар менен бааланган. Оорунун активдүүлүгү ASDASCRP, ASDASESR жана BASDAI деген индекстер менен эсептелген.

Жыйынтыктар

Бейтаптардын орточо жашы $42,19 \pm 1,93$ жашты түздү. Бейтаптардын 31% аялдар жана 69% эркектер болгон. HLA-B27 бейтаптардын 86% табылган. Оорунун узактыгы $10,8 \pm 7,72$ жыл болгон. Бейтаптарда АС оорусунун башталышы $28,3 \pm 4,37$ жашта болгон. ASDAS_{CRP} жана ASDAS_{ESR} тиешелүүлүгүнө жараша $2,83 \pm 1,2$ жана $2,76 \pm 0,24$ болгон. BASDAI индекси $4,7 \pm 0,34$ балл түзгөн жана 38% бейтаптарда BASDAI 4 баллдан аз болгон. Сакроилииттин белгилери 29% II стадияда, 13% II-III стадияда, 38% III жана 20% IV стадияларда табылган. Жабыркаган аймактын 68,5% бел омурткасына туура келген. Өзгөрүүлөрдүн 11,5% L1-L2 омурткаларында, 21,43% - L2-L3 омурткаларында 28,6%, L3-L4 байкалган. Мындан тышкары, бейтаптардын 7,1%да L4-L5 ортосундагы бузулган аймак табылган. Көкүрөк омурткасы жабыркашы 25,8% болгон. Көкүрөк омурткасынын башка аймактары аз пайыздарда жабыркаган. Ал эми моюнчасынын омурткасынын жабыркашы 5,7% түзгөн, ошолордун ичинен C5-C6, C6-C7 2,9% учурда, C7-C8 омурткалары -1,4% учурда жаракаттанган.

Корутунду

Көбүнчө жабыр тарткан аймактар бел омурткасында жайгашкан, ал эми моюн омурткасынын патологиялык өзгөрүүлөрү сейир байкалган. Омуртканын эң көп жабыркаган жерлери ар кандай бөлүмдөрдө болгон: моюн омурткасында C7-C8 омурткалар, көкүрөк омурткалары Th10-11 жана Th11-12 жана белдин L2-3, L3-L4 омурткалары. Келлгренин III жана IV стадиясы сакроилиит менен ооруган бейтаптарда көпүрө эмес же көпүрөлөөчү синдесмофиттер аныкталды.

Негизги сөздөр: анкилоздоочу спондилоартрит; омуртка, HLA-B27, С-реактивдүү белок, MRI, BASDAI.

ОБЛАСТЬ НАИБОЛЬШЕГО ПОРАЖЕНИЯ ПОЗВОНОЧНИКА У БОЛЬНЫХ АНКИЛОЗИРУЮЩИМ СПОНДИЛОАРТРИТОМ

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Цель

Выявить частоту наиболее поражённых участков позвоночника у пациентов с анкилозирующим спондилоартритом (АС).

Материалы и методы

Исследование проводилось в Ташкентской медицинской академии с 2020 по 2023 гг. В исследовании приняли участие 100 пациентов в возрасте от 18 до 60 лет с достоверным диагнозом АС, согласно Нью-Йоркским критериям (1984). У всех пациентов определялись демографические и клинические параметры заболевания, лабораторные показатели (СОЭ, С-РР, HLA-B27). Инструментальные исследования включали рентгенографию и МРТ позвоночника с захватом крестцово-подвздошных сочленений. Активность заболевания оценивалась с помощью индексов ASDAS_{CRP}, ASDAS_{ESR} и BASDAI.

Результаты

Средний возраст больных составил 42,19±1,93 года. Среди них женщин было 31%, а мужчин – 69%. HLA-B27 был обнаружен у 86% пациентов. Средняя длительность заболевания составила 10,8±7,72 лет. АС диагностирован у пациентов в возрасте 28,3±4,37 лет. Средние значения баллов ASDAS_{CRP} и ASDAS_{ESR}, BASDAI составили 2,83±1,2, 2,76±0,24, 4,7±0,34 соответственно. У 38% больных значения BASDAI было менее 4 баллов. Признаки сакроилиита II стадии обнаружены у 29%, II-III стадии – у 13%, III стадии – у 38% и IV – у 20% больных. У исследуемых пациентов поражение поясничного выявлялось в 68,5% случаев. Поражение поясничного отдела позвоночника в проекции L1-L2 наблюдалось у 11,5% больных. Повреждения были обнаружены между телами L2-L3 и L3-L4 позвонков (у 21,43% и 28,6% пациентов соответственно). Кроме того, у 7,1% обследованных больных выявлен патологический участок между L4-L5 позвонками. Грудной отдел позвоночника был вовлечен лишь в 25,8% случаев. У 4,3% пациентов поражение грудного отдела позвоночника обнаружено в основном между Th11-Th12, а у 5,7% – между Th11-Th12. Другие отделы позвоночника были повреждены в небольшом проценте случаев. В то же время, 5,7% повреждений выявлялись в шейном отделе позвоночника (1,4% в C5-C6 и C6-C7 и 2,9% в C7-C8).

Заключение

Наиболее часто отмечалось поражение поясничного отдела позвоночника. Повреждения выявлялись в разных отделах осевого скелета: в шейном отделе в C7-C8, в грудном отделе между Th10-11 и Th11-12 и в поясничном отделе – в L2-3, L3-L4. Синдесмофиты определялись в основном при наличии сакроилиита III и IV стадии по Келлгрену.

Ключевые слова: анкилозирующий спондилоартрит, позвоночник, HLA-B27 антиген, С-реактивный белок, МРТ, BASDAI.

THE MOST SPINAL INVOLVEMENT AREAS IN PATIENTS WITH ANKYLOSING SPONDYLARTHRTIS

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Purpose

Evaluate the most involved area on the spine in patients with ankylosing spondyloarthritis.

Materials and methods

The study was conducted at Tashkent medical academy between 2020-2023. The study participated 100 patients between 18-60 years old. New York (1984) criteria confirmed the diagnosis of all patients. All participants were subjected to demographic data, clinical and laboratory-ESR, C-RP, HLA-B27 and an x-ray and MRI of the sacroiliac joint and whole spine. On the spine, anterior-superior and anterior-inferior sides of vertebrae were evaluated by any lesions according to SpA. The disease activity was calculated by ASDAS_{CRP}, ASDAS_{ESR} and BASDAI.

Results

The average age of the patients was 42,19±1,93 years old. The patients were 31% women and 69% men. HLA-B27 was found in 86% of patients. Disease duration was 10,8±7,72 years. The disease onset of AS in patients was at the age of 28,3±4,37 years. The ASDAS_{CRP} and ASDAS_{ESR} was 2,83±1,2 and 2,76±0,24 respectively. BASDAI index showed 4,7±0,34 and 38% of patients BASDAI were less than 4. Signs of sacroiliitis were found II stages in 29%, II-III in 13%, III in 38% and IV in 20% of patients. On the lumbar spine, 68,5% of the damaged area was detected. Damage between the L1-L2 vertebrae involved 11,5% of patients. 21,43% and 28,6% of the patients, lesions were between the L2-L3 and L3-L4 respectively. In addition, in 7,1% of patients were found damaged area between L4-L5. The thorax spine was involved in only 25,8% of cases. 4,3% of patients found lesions on the thoracic spine between Th11-Th12 and 5,7% of patients between Th11-Th12. Other areas of the thoracic spine were found damaged in small percentages. Finally, 5,7% of the damaged area was found on the cervical spine from 1,4% in C5-C6, C6-C7 and 2,9% in C7-C8.

Conclusion

The most damaged areas were more often observed in patients on the lumbar spine and rarely on the cervical spine. The most damaged areas of the spine were in different sections: cervical spine C7-C8, thoracic spine between Th10-11 and Th11-12, lumbar spine L2-3, L3-L4. Detection of non-bridging or bridging syndesmophytes were noted in patients with sacroiliitis III and IV stage Kellgren.

Key words: ankylosing spondyloarthritis, spine, HLA-B27, C-reactive protein, MRI, BASDAI.

Introduction

Ankylosing spondyloarthritis (AS) is an unknown etiopathological chronic autoinflammatory arthritis in rheumatological diseases. Generally, patients suffer from inflammatory back pain; notably, the disease involves young males rather than females. AS onset is approximately between 25-30 years old. The disease affects mainly the sacroiliac joints (SIJ) and spine. However, AS is one of the seronegative spondyloarthropathy (SpA) members, but the main difference from SpA subtypes is signs of sacroiliitis and involvement of spine. Structural changes and new bone formations such as syndesmophytes and ankylosis appear respectively later in the spine and the SIJ that is due to inflammation. Interestingly, patients who suffer from the later stages of AS may not see the sky and sun due to irreversible structural changes in the spine. Some patients cannot lay in supine position because of spine curvature [3].

On the one hand, AS may manifest with various signs and symptoms. For example, inflammatory back pain, peripheral arthritis, uveitis, psoriasis and inflammatory bowel disease. Besides, AS affects the heart conduction system, aorta, and kidneys as IgA nephropathy. On the other hand, these symptoms may appear in other nosological forms, such as inflammatory bowel disease, psoriatic arthritis, and reactive arthritis. The onset of AS is primarily associated with the inflammation of the entheses, which are fibrous attachments between tendons and bones, located especially in areas such as the spine and sacroiliac joints.

These days rheumatological diseases are increasing because of many factors, such as impacting various triggers and also improving diagnostic approaches [1]. Evaluate radiographically progression of AS is main interesting field among rheumatologists. Therefore, this article aims to provide clinical features of AS and radiological symptoms and evaluate the radiological progression of disease in patients with AS.

Material and methods

During the period from 2020 to 2023, a research study was conducted at the Republic Rheumatology Center and the Specialized Outpatient Treatment Course of the Tashkent Medical Academy's Multidisciplinary Clinical Center in 100 patients diagnosed with AS in inpatient and outpatient examinations. Out of the 100 patients, 40 were diagnosed with early-stage AS based on X-ray findings, while the remaining 60 were diagnosed with established and late-stage AS. The diagnosis of patients was confirmed using the 2009 ASAS classification criteria and modified New York classification criteria. In the course of the research, all patients completed a clinical questionnaire. Laboratory tests included a complete blood count, C-reactive protein (CRP) level, HLA-B27 gene analysis. Instrumental examinations included x-ray and MRI evaluations of the sacroiliac joints and the spine. Additionally, disease activity was assessed using VAS, BASDAI, ASDAS-CRP, and ASDAS-ESR indices, and radiographic grading of sacroiliac joints was performed following the Kellgren radiographic classification. The evaluation of spinal mobility and structural changes was performed using the mSASSS index. The scoring was as follows: no change in the spine - 0 points, injury, sclerosis, or squaring - 1-point, non-bridging syndesmophytes - 2 points, and complete bridging syndesmophyte - 3 points. The total scores were collected, and the mSASSS index was calculated within the range of 0-72. Radiographic assessment of the

abovementioned structural changes was conducted in the lumbar and cervical spine lateral views. The research used non-eligibility criteria for participants were below 18 years old, with severe chronic or life-threatening diseases such as liver, heart and kidney insufficiency, and pregnant women. In addition, patients who were claustrophobia.

Results and discussion

The participants in the study had an average age of $42,19 \pm 1,93$ ($M \pm$ standard deviation), ranging from a minimum of 19 to a maximum of 60 years. The age distribution was as follows: the first group had an age range of 19 to 38, while the second group had an age range of 22 to 60. The male to female ratio was 3,76:1 with 79% male and 21% female. The presence of the HLA-B27 gene was found in 86% of patients. The average duration of the disease was $10,8 \pm 7,72$ years. However, it is worth noting that in the second group, the disease duration was approximately 15 years on average (Table 1).

Table 1

Variables	Results	
	I group	II group
Average age of patients, year	$37,67 \pm 0,91$	$46,7 \pm 2,52$
Duration of the disease, year	$8,3 \pm 4,72$	$14,8 \pm 5,36$
Presence of HLA-B27, %	77,5%	91,7%
Presence of peripheral arthritis, %	60%	43,3%
Signs of enthesitis, %	45%	40%
Dactylitis, %	5%	6,7%
Coxitis, %	2,5%	51,7%
Presence uveitis, %	7,5%	25%
Psoriasis, %	7,5%	11,2%
VAS	6,3	4,2%
BASDAI	$5,18 \pm 0,45$	$4,23 \pm 0,24$
ASDAS _{CRO}	$2,8 \pm 1,17$	$2,6 \pm 1,24$
ASDAS _{ESR}	$2,8 \pm 0,1$	$2,6 \pm 0,2$
C-RO mg/dl	$30,2 \pm 3,15$	$18,4 \pm 2,4$
ESR	$28,2 \pm 2,6$	$17,1 \pm 1,35$

In the diagnosis of AS, one of the supportive genetic testing methods is the identification of the HLA-B27 gene. However, it is important to note that not all patients with AS have this gene. There are variations in the presence of the HLA-B27 gene among patients, and these differences are highlighted in various scientific studies. In this study, patients were screened for the presence or absence of the HLA-B27 gene. Among all the patients, this gene was present in some and absent in others, with a ratio of approximately 6:1. In the first group, nearly 77,5% of patients had the HLA-B27 gene, while the remaining patients did not. In the second group, 91,7% of patients possessed the HLA-B27 gene.

Peripheral arthritis (knee, ankle, shoulder joints) was detected 1,38 times more often at the early stage of the disease, and coxitis 20,6 times more often at the late stage. Enthesitis occurred approximately equally often in both groups, dactylitis was very rare.

Coxitis was detected more often in patients of group 2 and in patients HLA-B27 positive. In almost all patients, coxitis was bilateral. The average age of onset of the disease in patients with coxitis was 26,3 years. After 10 years, 15,6% of patients with coxitis required endoprosthetics. The earlier in age the disease began, the higher the incidence of coxitis.

Uveitis was reported three or more times in the medical history or observed clinically in the second group more frequently than in the first group. When analyzing the presence of the HLA-B27 gene in patients with and without uveitis, it was noted that in the second group, where 93,3% of patients had the HLA-B27 gene, uveitis occurred more frequently compared to the first group, where this gene was present in 66,7% of patients. The presence of the HLA-B27 gene was associated with a higher frequency of uveitis in patients. Furthermore, the study revealed a correlation between a longer duration of the disease and an increased frequency of uveitis. As the duration of the disease exceeded 10 years, the frequency of uveitis significantly increased, particularly when the disease duration reached 10 years or more.

Another extra-articular symptom observed in patients was the presence of psoriasis. In the study, it was noted that 10% of the total patients had a history of or were clinically observed to have psoriasis skin lesions. Specifically, 7,5% of patients in the first group and 11,2% of patients in the second group had reported or clinically exhibited psoriasis skin lesions.

In the diagnosis of AS, X-ray and MRI data in the sacroiliac joint are important (Fig. 1).

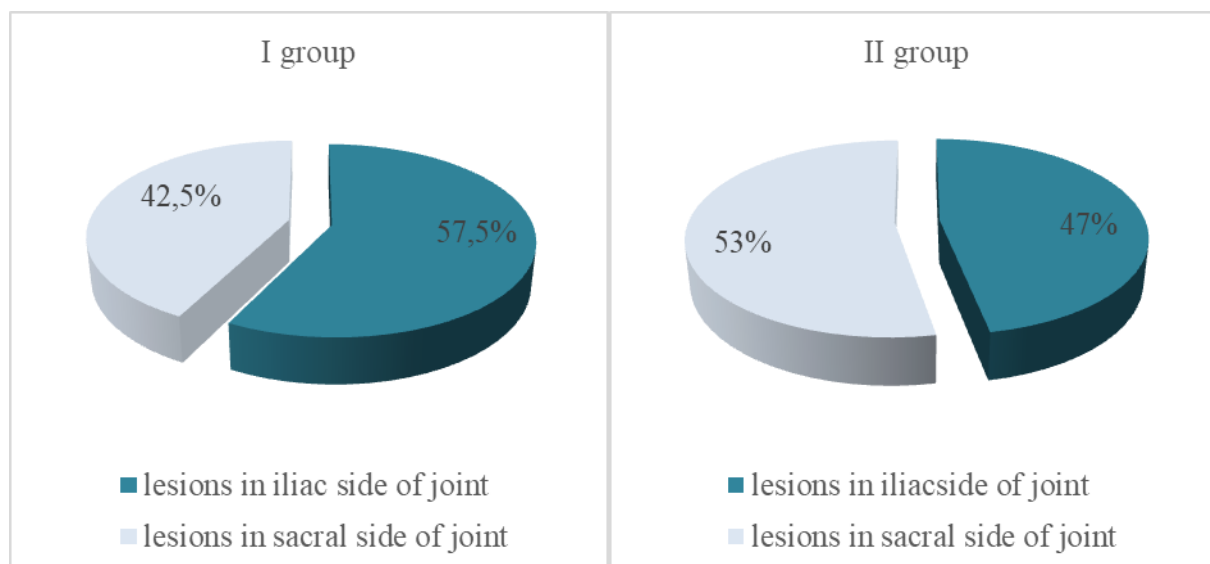


Fig. 1. Location side of the lesions in the sacroiliac joint in patients with ankylosing spondylitis

During instrumental examination of sacroileal joints, a distinction is made between radiologically undetectable (non-radiological) and reliably detectable radiological changes expressed in a late stage. In the 1st group, the lesion of the sacral bone was somewhat predominant, and in the 2nd ilium.

X-ray examination of the sacroileal joint revealed reliable radiological signs of sacroiliitis only from stage II in 29%, stage II-III in 13%, stage III in 38% and stage IV in 20% of patients in group 2. Patients of group 1 had unreliable radiological signs of sacroiliitis.

Damage to the spine in AS is the main feature that distinguishes this disease from other types of spondyloarthritis. The study examined the frequency of the greatest damage to individual areas of the spine (Fig. 2).

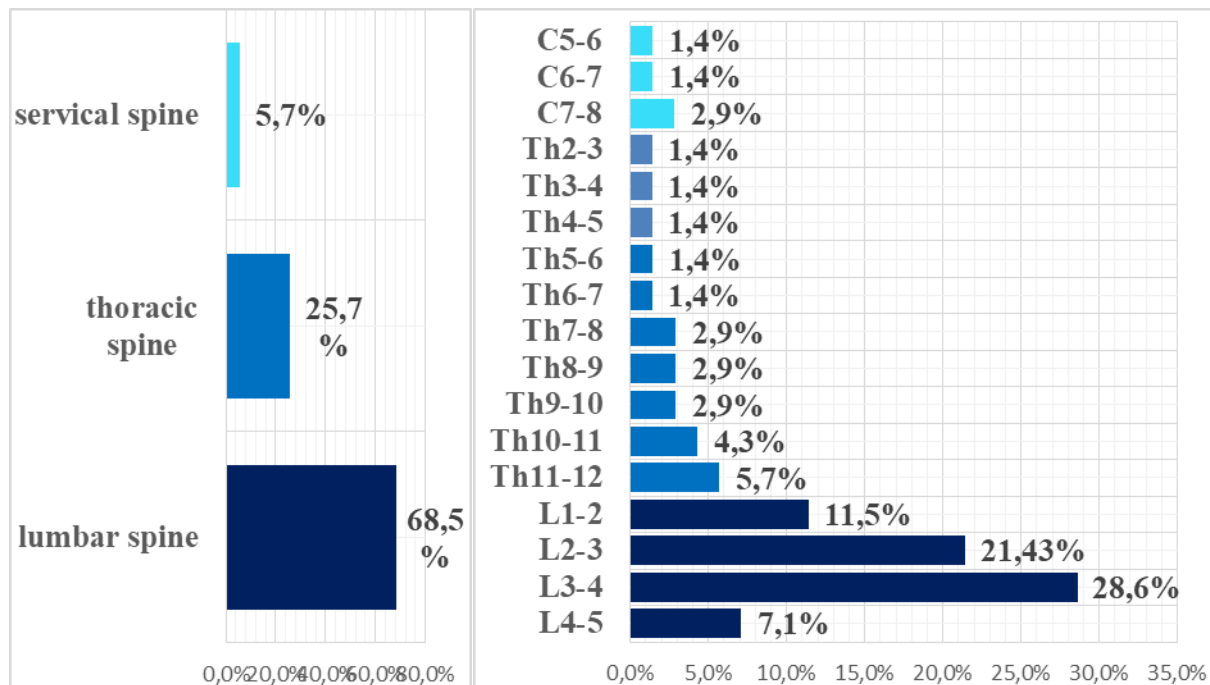


Fig. 2. The most involvement areas in the spine in patients with AS

As can be seen from Figure 2, injuries were more often observed in patients in the lumbar spine and MRI and rarely in the cervical spine. The most damaged areas of the spine were in different sections: cervical C7-C8, thoracic between Th10-11 and Th11-12, lumbar L2-3, L3-L4.

The detection of non-bridging and bridging syndesmophytes was noted in patients with sacroiliitis of stages III and IV according to Kellgren.

Non-bridging syndesmophytes appear in most cases in the thoracic region, merge with the vertebral

body and lead to curvature and kyphosis of the spine. Formed syndesmophytes with a bridge were mainly in the cervical and lumbar spine and limited the functional activity of patients.

This study observed most involvement areas in the spine in Uzbekistan. In patients with AS, the diagnosis may delay by more than 2-6 years [7]. The confirmation of AS use radiographic imaging technique as x-ray, MRI. Whole spine radiographic imaging provides characteristic symptoms or signs in patients of AS. Our study shows mostly lumbar spine involvement then other areas. In some research works, the authors mentioned that the most affected area is the thoracic segment [4].

Among patients with AS, one of the major symptoms of the disease is low back pain. In some case, back pain may be located only in the cervical or thoracic spine without pain in the lumbar area. Interestingly, only limitation of servical motion may observe in some patients without any involvement in other area of the spine. In our research work found that, it confirmed the greater frequency of cervical spine involvement with increasing disease duration. In early stage of disease, lumbar spine mostly affected. Cervical spine involvement reduces neck motion and produces progressive neck kyphosis, which may progress until the patient is unable to look forward. It also showed that the risk of cervical spine involvement is more common in symptomatic and structurally severe forms of AS [5,6].

In our research, the thoracic spine involvement was found 25,7% cases. Interestingly, non-bridging syndesmophytes appeared in most cases in the thoracic region, connect with the vertebral body and lead to curvature and kyphosis of the spine [2]. Bridging syndesmophytes with a bridge were mainly found in the cervical and lumbar spine and limited the functional activity of the patients.

Finding in our research, the most involvement area in spine of AS, gives direct patterns to others to find characteristic locations of signs according to AS.

Conclusion

The most damaged areas were more often observed in patients on the lumbar spine and rarely on the cervical spine. The most damaged areas of the spine were in different sections: cervical spine C7-C8, thoracic spine between Th10-11 and Th11-12, lumbar spine L2-3, L3-L4. Detection of non-bridging or bridging syndesmophytes were noted in patients with sacroiliitis III and IV stage Kellgren.

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