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O. A. Pokrashenko^{1*}, D. Zh. Taizhanova¹, Y. A. Drobchenko², A. A. Shalygina¹**ASSOCIATION BETWEEN DISEASE ACTIVITY AND ANTI-CCP STATUS IN EARLY RHEUMATOID ARTHRITIS: A CROSS-SECTIONAL STUDY**

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Introduction. Rheumatoid arthritis is a prevalent, disabling disease in which early diagnosis is crucial. The onset of the disease is generally associated with multiple risk factors; however, its etiology remains not fully understood. Currently, increased patient awareness and broad access to laboratory diagnostics for this condition enable timely detection and subsequent administration of appropriate treatment in accordance with clinical guidelines.

Aim. To evaluate patterns of rheumatoid arthritis manifestation based on clinical presentation in patients at an early stage of the disease, and to determine the association between risk factors, the status of antibodies to cyclic citrullinated peptide, disease activity (Disease Activity Score 28).

Materials and methods. A cross-sectional study was conducted on 48 patients with early-stage rheumatoid arthritis between 2025 and 2026 to identify patterns in the manifestation of the disease. Patients were surveyed, including identification of affected joint groups and associated risk factors. Disease activity was assessed using the DAS28, and patients were divided into groups with low, moderate, and high. Spearman's correlation was used to determine the relationship between anti-CCP status and DAS28 scores.

Results and discussion. Disease activity was low in 10.42% of cases, moderate in 68.75%, and high in 20.83%. Patients with a positive anti-citrullinated peptide (anti-CCP) antibody test had lower DAS28 scores compared to those with a negative anti-CCP antibody test. Spearman's correlation analysis demonstrated a statistically significant weak negative correlation between anti-CCP status and DAS28 scores ($r_s = -0.28$; $p = 0.048$).

Conclusion. Thus, in this study of 48 patients, most individuals with early-stage rheumatoid arthritis exhibited moderate disease activity, which was associated with a high prevalence of anti-cyclic citrullinated peptide (anti-CCP) antibody positivity. Laboratory testing for the presence of antibodies to cyclic citrullinated peptides in patients with manifestation of articular syndrome may have potential clinical value in the preclinical stages of rheumatoid arthritis.

Key words: arthritis, rheumatoid; risk factors; anti-citrullinated protein antibodies, DAS-28, early rheumatoid arthritis

INTRODUCTION

Rheumatoid arthritis (RA) is a multifactorial, systemic disease reflecting the autoimmune nature of its progression in the clinical presentation. To date, substantial evidence has been accumulated, allowing for an expanded understanding of the pathogenesis of this condition as well as the development of various therapeutic approaches. In the clinical presentation of this disease, manifestations are predominantly characterized by articular syndrome, as well as musculoskeletal features such as stiffness in muscles and ligaments, reflecting impaired function of affected joints. However, a preclinical phase has been identified by researchers and described in 2012 by the European Alliance of Associations for Rheumatology

(EULAR), representing an important stage in understanding disease development. During this phase, alterations in RA-related serum markers occur long before the appearance of initial clinical signs [1]. In the pathogenesis of the disease, a key role is attributed to autoimmune mechanisms, particularly involving macrophages and neutrophils.

Recent studies increasingly highlight the interplay not only of genetic predictors, environmental factors, and lifestyle, but also of the gut microbiota [2, 3, 4, 5] and oral microbiota [6, 7, 8]. In this context, probiotics and dietary interventions are being considered among contemporary therapeutic approaches. At the same time, an important research focus is the variability in disease prevalence, with a predomi-

nance observed in women. Accordingly, the influence of female sex hormones on the development of the pathological process must be taken into account, as supported by numerous studies and reviews [9, 10]. It is also important to recognize that this disease leads to a reduced quality of life and an increased risk of cardiovascular diseases [11]. Evidence suggests that patients with anti-cyclic citrullinated peptide (anti-CCP)-negative status tend to exhibit less pronounced clinical manifestations than those with anti-CCP-positive status [12].

Current research trends emphasize the distinct identification of a preclinical stage characterized by laboratory abnormalities in blood markers (anti-CCP, rheumatoid factor (RF), and C-reactive protein (CRP)). During this stage, the clinical presentation is typically oligosymptomatic, which complicates early diagnosis. This contributes to the «blurred» nature of the true clinical picture and disease activity, often resulting in delayed initiation of pathogenetic therapy, including the use of alternative treatments. Antibodies to the anti-cyclic citrullinated peptide are a standard diagnostic test for RA and often indicate a more severe course of the disease. However, data regarding the early stages of the disease and its association with serological and clinical status remain controversial.

In the clinical presentation of the disease, involvement of peripheral joints predominates, characterized by swelling and the presence of morning stiffness. Until 2010, the 1987 classification criteria for rheumatoid arthritis were used, which included key parameters such as morning stiffness, arthritis affecting three or more joints, arthritis of the hand joints, symmetry, the presence of rheumatoid nodules, a positive rheumatoid factor test, and characteristic erosive radiographic changes. The diagnosis was considered confirmed if at least four of these criteria were present for a duration of at least six weeks [13]. However, under these criteria, rheumatoid arthritis was often diagnosed at a later stage, when erosive changes and rheumatoid nodules had already developed, which is typical of established and advanced disease. In 2010, the classification criteria were revised, placing particular emphasis on the number and size of affected joints (large or small joints), laboratory findings (anti-cyclic citrullinated peptide (anti-CCP), rheumatoid factor, erythrocyte sedimentation rate (ESR), and C-reactive protein (CRP), disease duration (at least six weeks), as well as the specification of joints excluded from assessment [14].

Timely diagnosis and treatment allow patients to slow disease progression and improve quality of life, including both physical and psychological health outcomes. Studies have demonstrated an association between rheumatoid arthritis and an increased prevalence of depression and anxiety, which may exacerbate the course of the underlying disease [15]. Modification of risk factors in individuals with genetic

a predisposition (particularly smoking cessation and adherence to dietary recommendations) can contribute to improved treatment outcomes [16, 17].

Aim of the study was to evaluate patterns of rheumatoid arthritis manifestation based on clinical presentation in patients at an early stage of the disease, and to determine the association between risk factors, the status of antibodies to cyclic citrullinated peptide, disease activity (Disease Activity Score 28).

MATERIALS AND METHODS

A cross-sectional study design was conducted in patients with early rheumatoid arthritis between 2025 and 2026. Data were collected through in-person interviews with patients. Before the survey, respondents were informed about the purpose of the study and data confidentiality. Informed consent was obtained. The first phase involved a questionnaire. The second phase involved assessing Anti-CCP status and disease activity (Disease Activity Score 28). A standardized questionnaire, adapted based on literature data on risk factors, was used for data collection. The questionnaire included 7 questions with binary «YES» or «NO» responses. Laboratory results (Anti-CCP status) and clinical indicators (disease activity as measured by DAS 28) were then assessed. The questionnaire was not validated and was developed based on the scientific literature. The contents of the questionnaire are provided in Appendix 1. Based on laboratory test data, the laboratory indicator (anti-CCP) was assessed according to medical records. Disease activity was assessed using DAS 28 and patients were divided into groups with low (≤ 3.2), moderate (3.2-5.1), and high (>5.1). The study involved 48 patients from Karaganda region.

Inclusion criteria. The study included patients diagnosed with rheumatoid arthritis (RA) in accordance with the 2010 classification criteria of the American College of Rheumatology/European Alliance of Associations for Rheumatology (ACR/EULAR). The age of the participants ranged from 20 to 60 years. Patients with a disease duration of up to one year were enrolled, corresponding to the early stage of RA.

Exclusion criteria comprised: RA diagnosis not confirmed by laboratory data, rheumatic diseases, disease duration exceeding one year, absence of acute conditions (heart failure, renal failure, liver failure, decompensated psychiatric or neurological conditions), history of oncological diseases, pregnancy and lactation.

Clinical history was assessed to identify patterns of disease manifestation, the nature of joint involvement, and associated risk factors.

The relationship between risk factors, anti-cyclic citrullinated peptide (anti-CCP) antibodies, and disease activity was evaluated using the Disease Activity Score 28 (DAS28), including an assessment

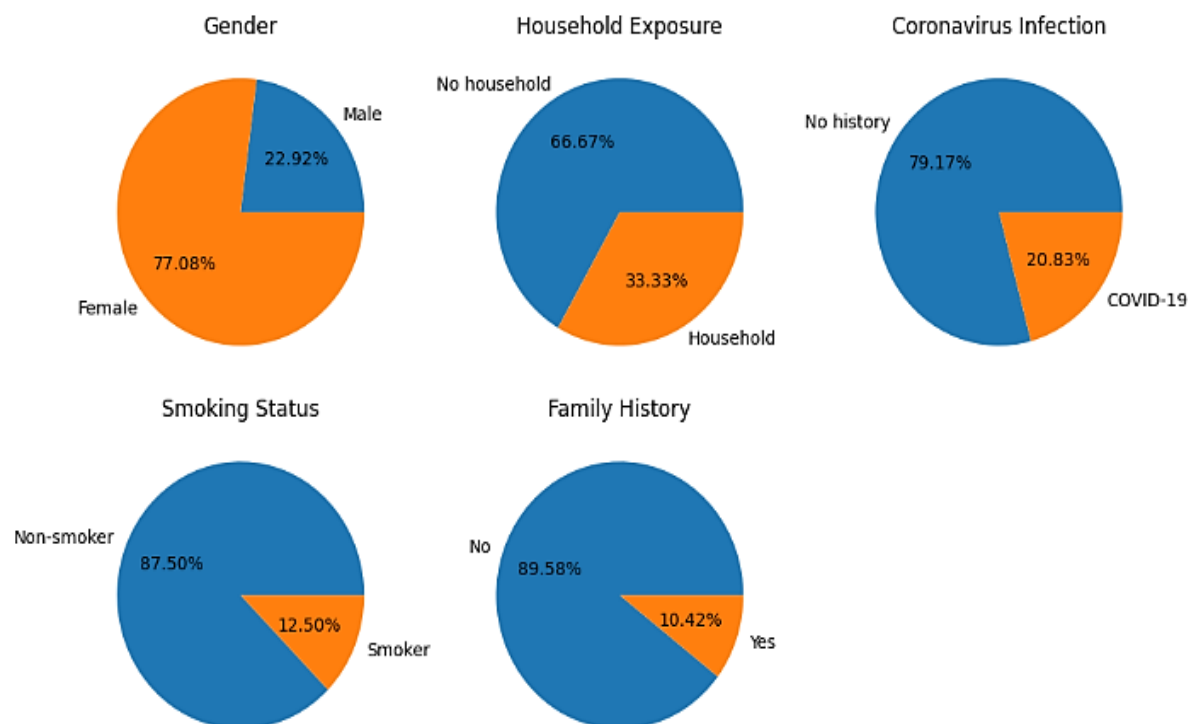


Figure 1 – Characteristics of the study sample by risk factors

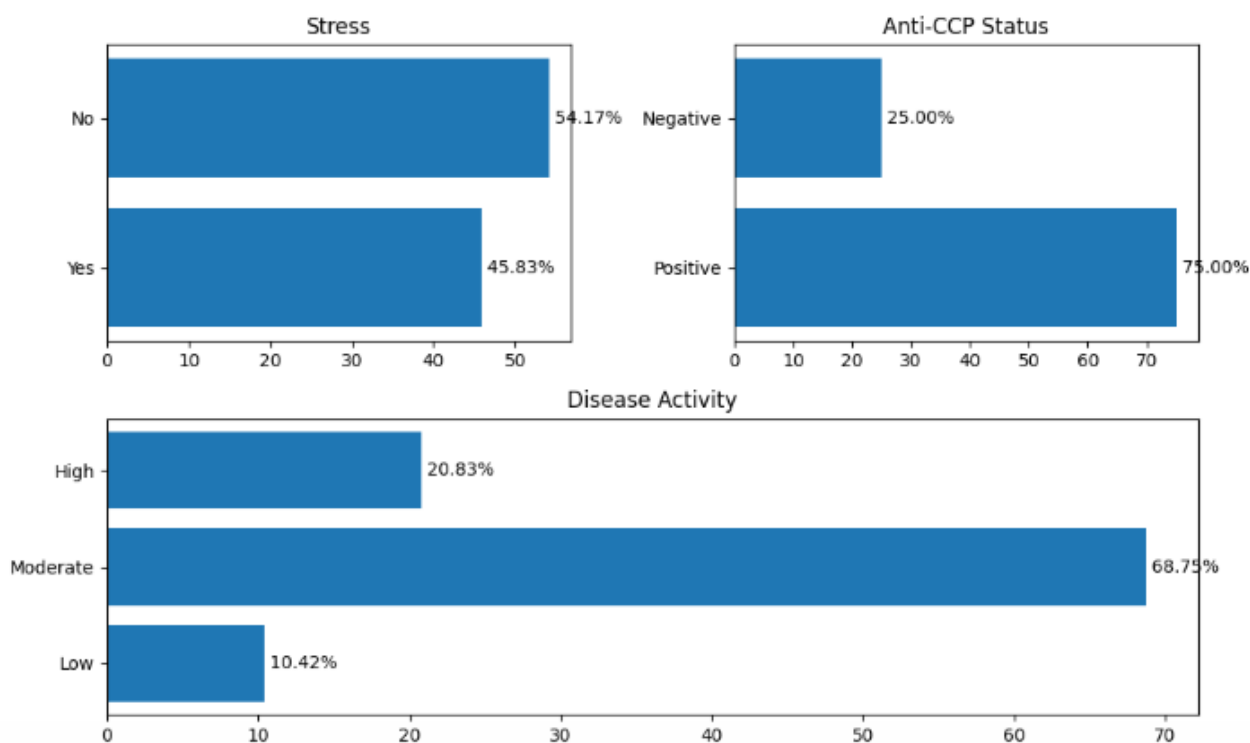


Figure 2 – Psychosocial and immunological factors

of the number of painful and swollen joints. Informed consent was obtained from all participants. At the time of enrollment in the study, some patients were

receiving standard antirheumatic therapy, primarily methotrexate at a dose of 10-12.5 mg per week lasting no more than 3 months.

Table 1 – Assessment of disease activity according to risk factors

Factors	n	%	95% CI	n	%	95% CI	n	%	95% CI
	I (low) (n=5)			II (moderate) (n=33)			III (high) (n=10)		
Anti-CCP									
Negative	–	–	–	8	24,24	11,09 – 42,26	4	40,00	12,16 – 73,76
Positive	5	100,00	47,82 – 100	25	75,76	57,74 – 88,91	6	60,00	26,24 – 87,84
Stress									
No	3	60,00	14,66 – 94,73	16	48,48	30,80 – 66,46	7	70,00	34,75 – 93,33
Yes	2	40,00	5,27 – 85,34	17	51,52	33,54 – 69,20	3	30,00	6,67 – 65,25
Household exposure									
No household	5	100,00	47,82 – 100	23	69,70	51,29 – 84,41	4	40,00	12,16 – 73,76
Household	–	–	–	10	30,30	15,59 – 48,71	6	60,00	26,24 – 87,84
Smoking status									
Non-smoker	5	100,00	47,82 – 100	27	81,82	64,54 – 93,02	10	100,00	69,15 – 100,00
Smoker	–	–	–	6	18,18	6,98 – 35,46	–	–	–
Coronavirus infection									
No history	4	80,00	28,36-99,49	27	81,82	64,54 – 93,02	7	70,00	34,75 – 93,33
History of infection	1	20,00	0,51-71,64	6	18,18	6,98 – 35,46	3	30,00	6,67 – 65,25
Sex									
Male	–	–	–	8	24,24	11,09 – 42,26	3	30,00	6,67 – 65,25
Female	5	100,00	47,82 – 100	25	75,76	57,74 – 88,91	7	70,00	34,75 – 93,33
Family history									
No	4	80,00	28,6 – 99,49	30	91,91	75,67 – 98,08	9	90,00	55,50 – 99,75
Yes	1	20,00	0,51 – 71,64	3	9,09	1,92 – 24,33	1	10,00	0,25 – 44,50
Inflections									
No	5	100,00	47,82-100	31	93,94	79,77 – 99,26	10	100,00	69,15-100,00
Yes	–	–	–	2	6,06	0,74 – 20,23	–	–	–

Statistical Analysis. For the description of event frequency, proportions were calculated with 95% confidence intervals (CI). Confidence intervals for proportions were estimated using the Wilson method. Statistical analysis was performed using the Epi Info software package (version 7). Quantitative variables are presented as mean $\pm$ standard deviation (SD). Normality of distribution was assessed using the Shapiro – Wilk test. Comparisons between two groups were conducted using the independent samples t-test. Differences were considered statistically significant at $p < 0.05$. The Spearman correlation coefficient was used to assess the relationship between variables. Statistical significance was established at $p < 0.05$.

RESULTS

A total of 48 patients were included in the study (fig. 1), of whom 77.08% were female and 22.92% were male. Anti-CCP antibodies were positive in 75% of patients and negative in 25%. The presence of household-related exposures was reported in 16 individuals (33.33%; 95% CI 20.40 – 48.41%), while 32 patients (66.67%; 95% CI 51.59 – 79.60%) reported no such exposure. A history of coronavirus infection was indicated by 10 patients (20.83%), and smoking by 6 patients (12.50%). A family history of autoimmune diseases (including rheumatoid arthritis and others) was identified in 5 patients (10.42%; 95% CI 3.47 – 22.66%). The main characteristics are shown in fig. 1.

Table 2 – Comparison of DAS28 according to anti-CCP status

Anti-CCP Status	n	Mean	SD	Student's t	p-value
Negative	12	4,62	0,7	2,55	0,017
Positive	36	3,97	0,9		

Table 3 – Localization of pain symptoms in joint groups

Onset: joint localization	Number of patients
Shoulder joints	4
Elbow joints	1
Wrist joint	9
Hand joints	17
Hip joints	0
Knee joints	15
Ankle joints	0
Foot joints	2

The absence of stress was reported by 26 patients (54.17%; 95% CI 39.17 – 68.63%), while 22 patients (45.83%; 95% CI 31.37 – 60.83%) reported experiencing stress. Anti-cyclic citrullinated peptide (anti-CCP) negativity was identified in 12 patients (25%), whereas 36 patients (75%) were anti-CCP positive. Regarding disease activity, low activity (grade I) was observed in 5 patients (10.42%; 95% CI 3.47 – 22.66%), moderate activity (grade II) in 33 patients (68.75%; 95% CI 53.75 – 81.34%), and high activity (grade III) in 10 patients (20.83%; 95% CI 10.47 – 34.99%). Thus, the majority of the sample demonstrated grade II (moderate) disease activity (fig. 2).

Among patients with grade II (moderate) disease activity ($n = 33$), a predominance of anti-cyclic citrullinated peptide (anti-CCP) positivity was observed. Specifically, 25 patients (75.8%; 95% CI 57.74 – 88.91%) were anti-CCP positive, highlighting the significance of this marker in assessing disease course (table 1).

Psychosocial factors also played a notable role. Specifically, stress was reported by 17 patients (51.5%; 95% CI 33.54 – 69.20%), which may indicate an influence of emotional state on disease activity. The presence of household-related exposure in the group with moderate disease activity was reported by 10 individuals (30.30%; 95% CI 15.59 – 48.71%), suggesting a potential association between socio-environmental conditions and the clinical course of the disease.

In the group with grade III (high) disease activity ($n=10$), the impact of household-related exposure was even more pronounced: 6 patients (60%; 95% CI 26.24 – 87.84%) reported its presence. This may indicate that, at higher levels of disease activity, social and domestic burdens become a significant factor influencing both the perception and progression of the disease.

Comparative analysis of mean DAS28 values between groups with different anti-cyclic citrullinat-

ed peptide (anti-CCP) status revealed a statistically significant difference ($t=2.55$; $p=0.017$), indicating an association between anti-CCP status and the level of disease activity (table 2).

To further investigate the nature of this relationship, a correlation analysis was conducted. The results showed a statistically significant weak negative correlation between the level of anti-cyclic citrullinated peptide (anti-CCP) and DAS28 scores ($r_s = -0.28$; $p=0.048$). This indicates that a higher level of CCP antibodies was associated with a slight decrease in DAS28 scores, which may suggest a more severe clinical presentation, timely treatment, and early diagnosis of the disease.

Although the strength of the association was weak, the coefficient of determination showed that anti-CCP levels accounted for approximately 8.2% of the variability in DAS28 ($r^2=0.082$).

When evaluating the variability of clinical manifestations, all patients reported a sudden onset and high intensity of joint pain. Twelve respondents described a migratory pattern of pain, which complicated diagnostic evaluation in the outpatient setting. Patients presenting with predominant fibromyalgia-like symptoms ($n=10$) were unable to clearly localize the most affected joint groups. Most patients reported severe pain, accompanied by an increased use of nonsteroidal anti-inflammatory drugs, particularly in the evening. Notably, 19 patients reported progressive loss of working capacity, including limitations in self-care activities. One patient presented with a persistent contracture of the third metacarpophalangeal joint. Forty out of 48 patients reported experiencing morning stiffness. Additionally, 11 patients reported disease onset characterized by joint pain and swelling with unilateral and asymmetrical involvement. The location of the affected joint groups in the early stages of the disease is shown in Table 3.

DISCUSSION

Rheumatoid arthritis (RA) is a multifactorial disease, the development of which is associated with a wide range of contributing factors. Several studies have demonstrated a causal relationship between COVID-19 infection and the subsequent development of RA [18, 19, 20]. Other predisposing factors include genetic susceptibility, smoking, infections, and environmental influences [21, 22].

In the present study, the pattern of disease manifestation was evaluated, showing that the wrist joints, hand joints, and knee joints were most commonly affected at disease onset, which is consistent with findings reported by other authors [12]. The results also demonstrated a predominance of anti-cyclic citrullinated peptide (anti-CCP) positivity, indicating a more pronounced clinical presentation characterized by joint pain syndrome. This may contribute to earlier healthcare-seeking behavior, timely diagnostic evaluation, and prompt initiation of treatment. Symmetry of joint involvement was reported in 58.33% of patients, which is consistent with findings reported by L. Weman et al. [23]. Despite early detection of initial manifestations, disease activity in the majority of cases ($n=33$) was classified as moderate. This observation may reflect the presence of a preclinical (laboratory) stage, during which pathogenic mechanisms are already affecting the joints without clear clinical expression. In this study, an association between early-stage disease, disease activity, anti-CCP levels, and risk factors was identified. Despite the relatively short disease duration, patients were able to clearly describe patterns of disease progression, including the nature of joint involvement (symmetrical vs. asymmetrical) and characteristics of pain (persistent or migratory).

Upper limb joints were most frequently involved at disease onset ($n=31$). It is important to emphasize that anti-CCP positivity and the presence of risk factors have prognostic value for early diagnosis and disease activity. The relationship between anti-CCP status and subsequent disease progression has also been reported in other studies [24, 25]. Notably, anti-CCP positivity at disease onset may serve as a predictor of an unfavorable disease course, characterized by a pronounced clinical picture.

The clinical manifestation of rheumatoid arthritis (RA) in most cases is characterized by involvement of the ligamentous–articular apparatus, particularly affecting the small joints of the hands and feet, as demonstrated in prospective studies and consistent with our findings [12, 26]. Daily domestic and occupational routine physical and household burden in at-risk individuals may also negatively affect the joint structures, potentially contributing to disease progression and earlier onset [27, 28].

Psychosocial factors likewise play an important role in disease manifestation by triggering a cascade of biochemical reactions that disrupt the

balance between pro-inflammatory and anti-inflammatory cytokines, impair self-regulatory processes, and contribute to higher disease activity [29]. The results of the correlation analysis between anti-cyclic citrullinated peptide (anti-CCP) levels and DAS28 scores ($r_s = -0.28$; $p=0.048$) suggest that seronegative status may influence the aggressive course of the disease, as assessed by clinical characteristics [30]. It should be emphasized that anti-cyclic citrullinated peptide (anti-CCP) antibodies have high prognostic value for the early diagnosis of RA and are considered an essential biomarker in the presence of joint pathology, given the systemic nature of the disease and the risk of subsequent disability, which significantly impacts patients' quality of life.

CONCLUSION

The results of this study are consistent with the current understanding that immunological markers reflect certain aspects of the pathogenesis of RA but do not fully reflect the clinical activity of the disease. This underscores the need for a timely, comprehensive approach to assessing patients' condition, incorporating both clinical and laboratory data. Thus, in our study, most patients with early-stage rheumatoid arthritis had moderate disease activity, which was associated with a high frequency of positive results for anti-CCP antibody positivity. Psychosocial factors (stress), previous coronavirus infection, smoking, and working on agricultural land may be associated with disease development, but further research is needed. In our study, an Anti-CCP positive status was associated with lower DAS-28 scores, which may reflect a clear clinical presentation, diagnostic investigation, and timely initiation of therapy. Further investigation into the approach to timely diagnosis and the assessment of the clinical profile remains relevant and warrants further study.

Limitations. A small sample size, and the fact that some patients were receiving baseline therapy, which could have influenced disease activity as measured by DAS-28. The questionnaire was developed for a specific study based on existing data in the scientific literature; however, no preliminary validation was conducted.

Author contributions:

O. A. Pokrashenko, D. Zh. Taizhanova, Y. A. Drobchenko – conceptualization.

O. A. Pokrashenko – methodology, investigation.

O. A. Pokrashenko, Y. A. Drobchenko, A. A. Shalygina – formal analysis.

Y. A. Drobchenko – data curation.

O. A. Pokrashenko, Y. A. Drobchenko – writing: original draft preparation.

O. A. Pokrashenko, D. Zh. Taizhanova, Y. A. Drobchenko – writing: review and editing.

Y. A. Drobchenko – visualization.

D. Zh. Taizhanova – supervision, project administration.

Conflict of interest:

The authors declare no conflict of interest.

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АССОЦИАЦИЯ МЕЖДУ АКТИВНОСТЬЮ ЗАБОЛЕВАНИЯ И АЦЦП-СТАТУСОМ ПРИ РАННЕМ РЕВМАТОИДНОМ АРТРИТЕ: ПОПЕРЕЧНОЕ ИССЛЕДОВАНИЕ

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Введение. Ревматоидный артрит является широко распространенным заболеванием, приводящим к инвалидности, при котором решающее значение имеет ранняя диагностика. Возникновение заболевания, как правило, связано с множеством факторов риска; однако его этиология до сих пор не до конца изучена. В настоящее время повышение осведомленности пациентов и широкий доступ к лабораторной диагностике этого заболевания позволяют своевременно выявлять его и назначать соответствующее лечение в соответствии с клиническими рекомендациями.

Цель. Оценить особенности проявления ревматоидного артрита на основе клинической картины у пациентов на ранней стадии заболевания, а также определить взаимосвязь между факторами риска, уровнем антител к циклическому цитруллинированному пептиду и активностью заболевания DAS-28 (индекс активности заболевания 28).

Материалы и методы. В 2025 – 2026 гг. было проведено поперечное исследование с участием 48 пациентов с ревматоидным артритом на ранней стадии с целью выявления закономерностей проявления заболевания. Был проведен опрос пациентов, включая определение пораженных групп суставов и сопутствующих факторов риска. Активность заболевания оценивали с помощью шкалы DAS28, и пациенты были разделены на группы с низкой, умеренной и высокой активностью. Для определения взаимосвязи между анти-CCP статусом и показателями DAS28 использовали коэффициент корреляции Спирмена.

Результаты и обсуждение. Активность заболевания была низкой в 10,42% случаев, умеренной – в 68,75 %, высокой – в 20,83%. У пациентов с положительным результатом теста на антитела к цитруллинированным пептидам (анти-CCP) показатели DAS28 были ниже, чем у пациентов с отрицательным результатом теста на анти-CCP. Корреляционный анализ по Спирмену продемонстрировал статистически значимую слабую отрицательную корреляцию между уровнями анти-CCP и показателями DAS28 ($r_s = -0,28$; $p = 0,048$).

Закключение. Таким образом, в исследовании с участием 48 пациентов у большинства лиц с ревматоидным артритом на ранней стадии наблюдалась умеренная активность заболевания, что было связано с высокой распространенностью положительных результатов на антитела к циклическим цитруллинированным пептидам (анти-CCP). Лабораторное исследование на наличие антител к циклическим цитруллинированным пептидам у пациентов с проявлениями суставного синдрома может иметь потенциальную клиническую ценность на доклинической стадии ревматоидного артрита.

Ключевые слова: ревматоидный артрит; факторы риска; антитела к цитруллинированным белкам; DAS-28; ранний ревматоидный артрит

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ЕРТЕ РЕВМАТОИДТЫ АРТРИТ КЕЗІНДЕГІ АУРУ БЕЛСЕНДІЛІГІ МЕН ЦИКЛДІ ЦИТРУЛЛИНДЕЛГЕН ПЕПТИДКЕ ҚАРСЫ АНТИДЕНЕЛЕР (ANTI-CCP) МӘРТЕБЕСІ АРАСЫНДАҒЫ БАЙЛАНЫС: КӨЛДЕНЕҢ ЗЕРТТЕУ

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Кіріспе. Ревматоидты артрит (РА) – кең таралған, еңбекке қабілеттіліктің төмендеуіне және мүгедектікке әкелуі мүмкін созылмалы аутоиммунды ауру. Ауруды ерте диагностикалау тиімді емді дер кезінде бастап, оның үдеуін баяулатуға мүмкіндік береді. РА-ның дамуы бірнеше қауіп факторларымен байланысты болғанымен, оның этиологиясы толық анықталмаған. Қазіргі таңда халықтың медициналық сауаттылығының артуы және зертханалық диагностиканың қолжетімділігі ауруды ерте анықтап, клиникалық ұсынымдарға сәйкес ем жүргізуге мүмкіндік береді.

Зерттеудің мақсаты. Ерте сатыдағы ревматоидты артриті бар науқастардағы аурудың клиникалық көріністерін бағалау және қауіп факторларының, циклді цитруллинделген пептидке қарсы антиденелердің (anti-CCP) мәртебесі мен ауру белсенділігі (Disease Activity Score 28 – DAS28) арасындағы байланысты анықтау.

Материалдар және әдістер. 2025 – 2026 жылдары ерте сатыдағы ревматоидты артритпен ауыратын 48 науқастың қатысуымен көлденең зерттеу жүргізілді. Науқастарға сауалнама жүргізіліп, зақымдалған буындар, аурудың клиникалық ерекшеліктері және қауіп факторлары бағаланды. Ауру белсенділігі DAS28 индексі бойынша анықталып, науқастар төмен, орташа және жоғары белсенділік топтарына бөлінді. Anti-CCP деңгейлері мен DAS28 көрсеткіштері арасындағы байланыс Спирменнің рангілік корреляциялық талдауы арқылы анықталды. Сондай-ақ қауіп факторларының және anti-CCP мәртебесінің ауру белсенділігімен байланысы бағаланды.

Нәтижелер және талқылау. DAS28 бойынша ауру белсенділігі 10,42%-ында төмен, 68,75%-ында орташа және 20,83%-ында жоғары деңгейде анықталды. Anti-CCP оң науқастарда DAS28 көрсеткіші anti-CCP теріс науқастарға қарағанда төмен болды. Спирменнің корреляциялық талдауы anti-CCP деңгейі мен DAS28 көрсеткіші арасында статистикалық маңызды әлсіз теріс корреляцияны көрсетті ($r_s = -0,28$; $p = 0,048$).

Қорытынды. Зерттеуге енгізілген 48 ерте сатыдағы ревматоидты артриті бар науқастардың басым көпшілігінде аурудың орташа белсенділігі анықталды. Сонымен қатар, anti-CCP антиденелерінің оң мәртебесі жоғары жиілікте кездесті. Буын синдромы бар науқастарда anti-CCP антиденелерін анықтау ревматоидты артритті ерте диагностикалауда және аурудың клиникалық ерекшеліктерін бағалауда маңызды зертханалық көрсеткіш болуы мүмкін.

Кілт сөздер: ревматоидты артрит; қауіп факторлары; циклді цитруллинделген пептидке қарсы антиденелер (anti-CCP); DAS-28, ерте ревматоидты артрит

Appendix 1

Patients were asked to answer the following questions listed below. The answer options are binary: YES/NO

1. Do you have a history of a laboratory-confirmed coronavirus infection (COVID-19)? YES/NO
2. According to your medical history, have you had an infectious disease (bacterial or viral) in the past 9 months that was followed by significant joint pain? YES/NO
3. Current smoking status: smoker/non-smoker? YES/NO
4. Does any of your first-degree relatives have a history of rheumatic diseases? YES/NO
5. Regular contact with soil while working on agricultural land: YES/NO
6. Significant stress experienced by the patient in the last 9 months (based on the respondent's subjective feelings): YES – stress was present; NO – there was no stress
7. Gender indicated: Female/Male

*Patients who answered YES smoke daily. Patients who answered NO have never smoked.

The survey was conducted in Russian