The Bioscan AN INTERNATIONAL QUARTERLY JOURNAL OF LIFE SCIENCES 19(2): S.I (1), 667-670, 2024 www.thebioscan.com

UDC: 616.085-72-002.77: 616-002.77

IMMUNOLOGICAL ASPECTS OF SPINE INJURY IN REACTIVE ARTHRITIS

Khalmurad S. Akhmedov[1], Lola A. Abdurakhimova[2], Feruza I. Khalmetova[1]

Madina B. Rakhimova[1], Sagdiyana N. Buranova[1], Barno M. Mirzayeva[3],

Ibrat A. Axmedov[4]

Tashkent Medical Academy[1]

Kimyo International University in Tashkent[2]

Tashkent Pediatric Medical Institute[3]

Samarkand State Medical University[4]

DOI: https://doi.org/10.63001/tbs.2024.v19.i02.S.I(1).pp667-670

KEYWORDS
reactive arthritis,
IL-17A,
spondyloarthritis,
structural
disorders,
joints syndrome
Received on:

15-09-2024

Accepted on:

19-12-2024

ABSTRACT

It is now known that the infection factor plays an important role in the development of reactive arthritis (ReA) and that lymphocytes play an important role in its development. In recent years, adequate results have been achieved in the study of the pathogenesis of this disease and the development of modern diagnostic and treatment methods. Because the role of IL-17A, one of the pro-inflammatory cytokines, in the development and progression of axial spondyloarthritis and due to this, structural disorders in the spine has been proven.

INTRODUCTION

Pathological immunological processes increase the possibility of changes in the amount of IL-17A in different ways leading to erosion on the bone surface and joint incongruity. Therefore, it is important to determine the importance of IL-17A in ReA with spondylitis and to evaluate its role in structural disorders in this disease. In this case, its participation in the inflammatory process leads to various changes in the tissues of bone and joint structures, especially in the spine. In addition, changes in such a transformation can fundamentally damage the properties of the morphological substrate in the structures of the spine. Based on the literature, it can be said that patients with genitourinary form of ReA show different levels of structural disorder in the joint bone structure, and the formation of spondylitis in a certain situation causes a decrease in amortization activity in them. However, the increase in the amount of IL-17A raises the possibility that it is one of the main causes of the progression of structural disorders in them.

Therefore, when spondyloarthritis develops in patients with ReA, there is an incentive to start early treatment aimed at identifying and restoring structural disorders in the spine. In this situation, it is appropriate to determine the amount of IL 17 A and IL 18 in the blood serum of patients with ReA. For example, the increase of pro-inflammatory cytokines in the blood serum of patients affects osteoblast-osteoclast regulation, leads to bone destruction and forms pathological bone tissue, appear syndesmophytes, and eventually leads to spondyloarthritis. Therefore, it was emphasized to study the role of IL-17A and IL-18 in the blood serum of the patients involved in the disease development and its activity level.

Material and methods

In a prospective analysis of a scientific study, 184 patients with ReA were selected based on the data of the proposed clinical classification of ReA and the results of clinical and laboratory examination. 184 patients with ReA and 112 patients with spondyloarthritis (ReSA) were involved in the research. The composition of the patients involved in the study was in the age range of 20-54 (32.3±10.2), the average duration of the disease was 3.7±1.8 years. 132 (71.7%) of the patients under observation were men and 52 (28.3%) were women, respectively.

Results and discussion

According to the results of the study, it was found that the amount of IL-17A varies within wide limits in the patients involved in the scientific work. As shown in Figure 1, compared to the control group, there was a tendency to increase the total index of IL-17Amiqdori in both groups of ReA patients, that is, men and women, but it was not statistically significant (r>0.05). In healthy men, the amount of IL-17A was 62.4±11.24 ng/ml, while in patient men this indicator increased to 173.3±35.2 ng/ml (r>0.002). On the other hand, in healthy women IL 17A was

detected in the amount of 53.4±8.2 ng/ml, and in patient women it increased to 125.2±32.8 ng/ml (r>0.05).

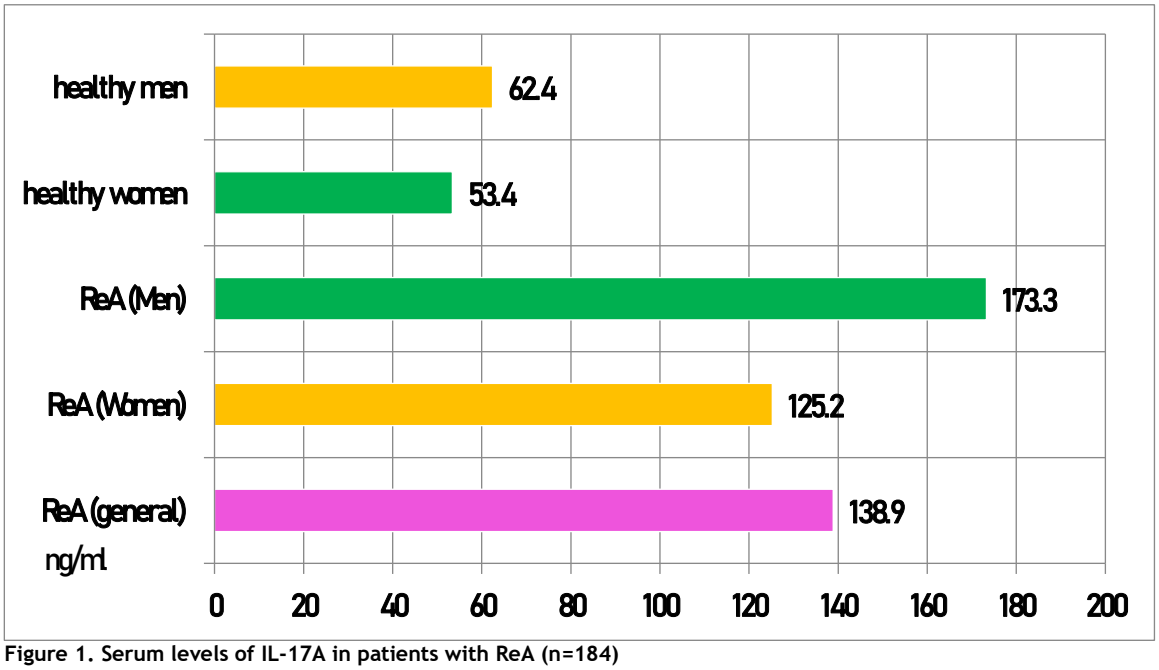

Figure 1. Serum levels of IL-17A in patients with ReA (n=184)

According to the results of the study, it was found that the amount of IL 17A varies within wide limits in the patients involved in the scientific work. As shown in Figure 1, compared to the control group, there was a tendency to increase the total index of IL-17A in both groups of ReA patients, that is, men and women, but it was not statistically significant (r>0.05). In healthy men, the amount of IL-17A was 62.4±11.24 ng/ml, while in patient men this indicator increased to 173.3±35.2 ng/ml (r>0.002). On the other hand, in healthy women IL 17A was determined in the amount of 53.4±8.2 ng/ml, and in patient women it increased to 125.2±32.8 ng/ml (r>0.05).

In particular, differences in the amount of IL-17A were found between both groups. As can be seen from Figure 2, the percentage of increased reference values of IL-17A was 58.8% in group I. On the other hand, IL-17A increased in 27.4% of patients of the group II compared to the reference values.

Thus, in ReA, in some cases, structural disorders are observed based on structural changes in the bone-joint tissue, which are aggravated.

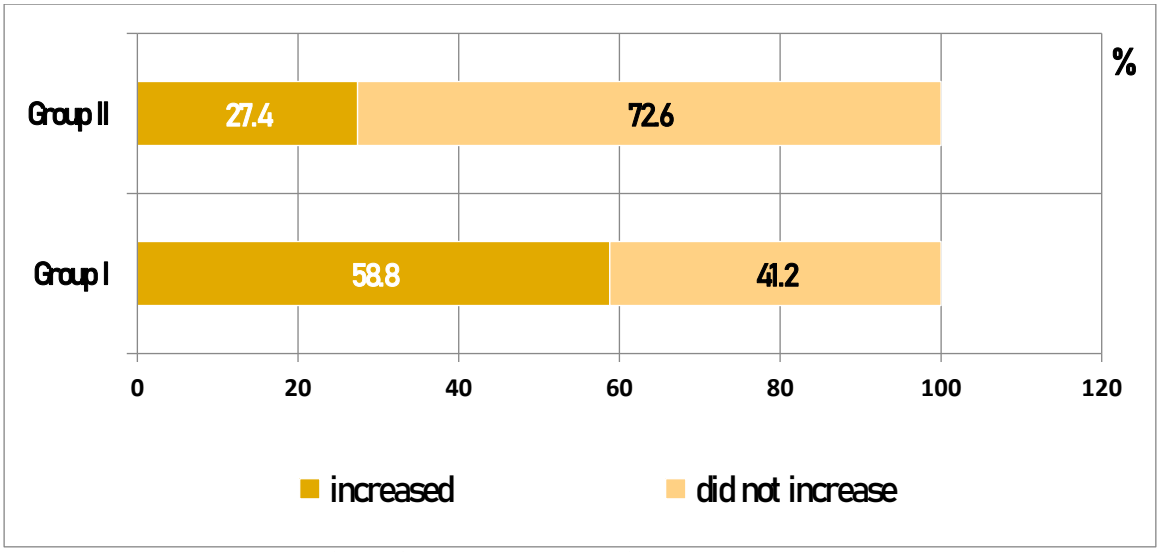

Figure 2. Proportion of elevated IL-17A in patients with ReA.

According to the form of the disease, taking into account the specificity of the clinical course and X-ray signs, the dynamics of the amount of IL-17A was evaluated. It is worth noting that the obtained results were found to have some reliable level of differences according to the trigger factor, course and duration of the disease.

Table 1.

According to the results of the analysis, it can be seen from Table 1 that the IL-17A level in the serum of patients of group I (genitourinary form) in the main group compared to the control group is reliable r<0.02; r<0.001 was raised accordingly. In addition, statistically significant (r>0.05) indicators were not determined in group II (postenterocolitic form).

Quantitative values of IL 17A in patients with ReA

Groups	IL 17A ng/ml		P
	Men	Women	
Control group (n=20)	62,4±11,24	53,4±8,2	p>0,05
I group (n=103)	151,2±18,1	145,1±7,5	p^m<0,02; p^w<0,001
II group (n=81)	93,1±37,1	84,1±35,3	P^m>0,05; p^w>0,05
General (n=184)	121,3±35,2	103,2±32,8	P^m<0,05; p^w>0,05

Note: p – men and p- women are conventional confidence level indicators of the difference between the indicators of women and the control group.

On the other hand, when the groups were divided according to the presence of spondyloarthritis (ReA per se and reactive spondyloarthritis (ReSA)), there were clear differences in the level of IL-17A.

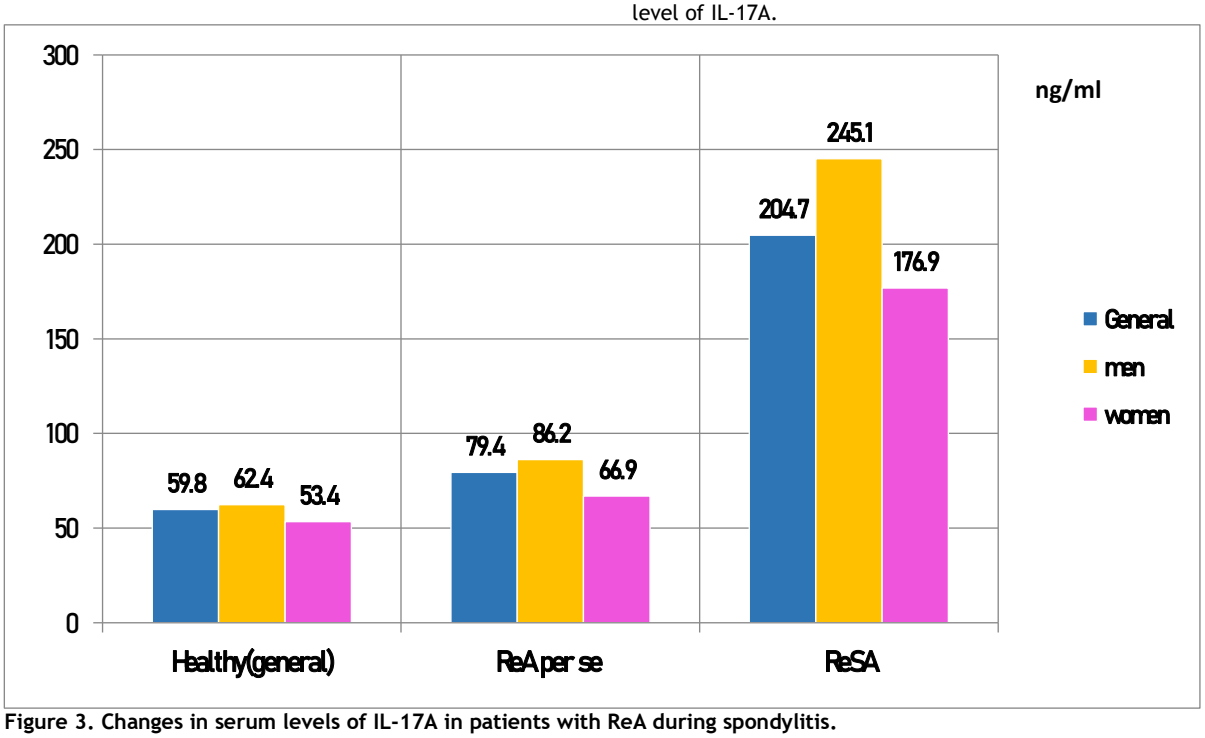

Figure 3. Changes in serum levels of IL-17A in patients with ReA during spondylitis.

In particular, it can be seen from Figure 3 that the indicators of IL-17A in ReSA (n=112) are clearly increased compared to ReA (n=72). Compared to the amount of IL-17A in healthy subjects (62.4±11.24 ng/ml), this indicator increased to 204.7±44.5 ng/ml in patients with ReSA. On the other hand, ReA per se IL-17A was determined in the amount of 79.4±38.1 ng/ml and there was no statistically significant difference compared to healthy people. Furthermore, IL-17A appeared to be 2.5-fold increased in ReSA compared to ReA. This situation indicates that IL-17A plays an important role in structural disorders of the ReSA spine. Corresponding differences were also observed in the change of the amount of IL-17A during the course of the disease in patients with ReSA.

CONCLUSION

Thus, based on the results of the conducted scientific work, it can be concluded that the increase of IL-17A from the initial stages of ReSA and its increase as the disease progresses and the formation of spondylitis from its early stages are related. In addition, damage to the spine based on the increase in the amount of IL-17A indicates that this disease is more specific to the genitourinary form and chronic course.

REFERENCES

- Ibtissam Bentaleb.Kawther Ben Abdelghani, Samira Rostom, Bouchra Amine, Ahmed Laatar,2 and Rachid Bahiri1 Reactive Arthritis: Update Curr Clin Microbiol Reports. 2020, 26.09: 1-9.
- Iglesias-Gamarra A, Mendez EA, Cuellar ML, Ponce de Leon JH, Jimenez C, Canas C, et al. Poststreptococcal reactive arthritis in adults: long-term follow-up. Am J Med Sci. 2001;321:173-177.
- Inman RD. Reactive arthritis. In: Hochberg ML, AJ,Smolen JS, Weinblatt ME, Weisman MH, editors. Rheumatology. 6th ed.; 2015. P. 928-40.
- Khalmetova F.I., & Akhmedov K.S. (2021). Characteristics Of Articulate Syndrome In Patients With Reactive Arthritis. The American Journal of Medical Sciences and Pharmaceutical Research, 3(01), 179-182.
- Rakhimova, M. B., Akhmedov, K. S., Rakhimov, S. S.(2023). Extrasceletal Manifestations in Patients with Ankylosing Spondylitis. Journal of Coastal Life Medicine, 11, 1315-1321.
- Sharma M, Sharma S, Sharma A, Sharma K. *Chlamydia trachomatis* associated reactive arthritis: a urinary PCR based study. Indian Dermatol Online J. 2020;11:21-24.
- Sharp J.T., Lidsky M.D., Collins L.C. et al. Method of scoring the progression of radiologic changes in rheumatoid arthritis. Arthr Rheum 1971;14:206-20.
- Siala M, Gdoura R, Fourati H, Rihl M, Jaulhac B, Younes M, Sibilia J, Baklouti S, Bargaoui N, Sellami S, Sghir A, Hammami A. Broad-range PCR, cloning and sequencing of the full 16S rRNA gene for detection of bacterial DNA in synovial fluid samples of Tunisian patients with reactive and undifferentiated arthritis. Arthritis Res Ther. 2009;11:R102.

- Siala M, Jaulhac B, Gdoura R, Sibilia J, Fourati H, Younes M, Baklouti S, Bargaoui N, Sellami S, Znazen A, Barthel C, Collin E, Hammami A, Sghir A. Analysis of bacterial DNA in synovial tissue of Tunisian patients with reactive and undifferentiated arthritis by broad-range PCR, cloning and sequencing. Arthritis Res Ther. 2008;10:R40.
- Бунчук НВ, Бадокин ВВ, Каратаева ТВ. Реактивные артриты. В кн.: Насонов ЕЛ, Насонова ВА, редакторы. Ревматология. Национальное руководство. Москва: ГЭОТАР-Медиа; 2008. С. 348-54.
- Гапонова Т.В., Лила А.М., Шемеровская Т.Г., Захарова Г.А., Масляева Т.Н. Изучение цитокинового статуса больных реактивным артритом. Медицинская иммунология. 2008;10(2-3):167-172.
- Дустбабаева Н.Д., Ирсалиева Ф.Х., Нурматова Н.Ф., Байбекова В.Ф., Айдарова Н.П., Ахмедов Х.С. Полиморфизм rs2275913 гена ил17а в узбекской популяции и его связь с развитием аллергического ринита // Российский иммунологический журнал 2020, Т. 23, № 4, стр. 443-448.
- Костарева О.С., Габдулхаков А.Г. Интерлейкин-17: функциональные и структурные особенности // Успехи биологической химии, 2019. Т. 59. С. 393-418.
- Халметова ФИ, Ахмедов Х. С., Буранова СН (2022). Значение рентгенологического обследования в диагностике больных реактивным артритом (ретроспективный анализ). Galaxy International Interdisciplinary Research Journal, 10 (5), 217–220.