

Analysis of risk factors for the development of cardiovascular diseases in patients with rheumatoid arthritis, depending on gender

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Abstract

Background: Rheumatoid arthritis is recognized to be an adverse risk factor of cardiovascular diseases.

Aim: To determine the structure and frequency of occurrence of traditional risk factors of cardiovascular diseases, depending on the gender of patients with rheumatoid arthritis.

Material and methods: The case histories of 70 patients (men n-23, women n-47) according to the criteria of the diagnosis of ACR / EULAR 2010 were analyzed. The SCORE scale was used to assess cardiovascular risk. In patients with rheumatoid arthritis duration of more than 10 years, seropositive for rheumatoid factor and antibodies to cyclic citrulline peptide, with systemic manifestations according to the recommendations of EULAR, an adapted SCORE/EULAR model is used; risk is recalculated taking into account the coefficient of 1.5. These studies were processed using statistical programs the Microsoft Office Excel 2010 and the IBM SPSS 21 program.

Results: Women with rheumatoid arthritis who smoke less (4.3%) than men (60.9%) at $p < 0.01$. At the same time, the frequency of arterial hypertension is higher in men than in women (65.2% and 40.4%). In men the age factor is in the first row (78.3% and 44.4%, $p < 0.01$). Depending on the gender of the patients, the difference among other cardiovascular diseases risk factors was insignificant. The mean of the total cholesterol ($M \pm SD$) did not differ significantly between men and women (5.58 ± 0.98 , 5.64 ± 0.91 , $p > 0.05$). In the study, body weight index analysis showed that the body mass index of women were higher than men ($M \pm SD$ 28.1 ± 6.3 , 26.6 ± 3.8). The difference in body mass index by gender was significant ($p < 0.05$). Depending on gender specificity, the mean value of systolic blood pressure/diastolic blood pressure was higher in men than in women ($129 \pm 16.7/82.2 \pm 8.5$ and $136.7 \pm 13.1/86 \pm 7$) and statistically significant ($p < 0.05$). Women with low and middle risk of cardiovascular diseases prevailed (21.3% and 57.4%) than men (8.7% and 30.4%). The majority of men had a high and very high risk (21.7% and 39.1%), while women were in a smaller number (6.4% and 14.9%). There was a significant correlation between the men and women with the cardiovascular diseases risk, i.e. the $p = 0,012$ ($p < 0,05$) measured by the chi-squared criterion.

Conclusion: So, if the first step for prevention of cardiovascular diseases in the treatment of patients with rheumatoid arthritis is not sufficient correction of traditional risk factors, it is possible to develop complications of cardiovascular diseases. At the same time, the impact of rheumatoid arthritis on the development of cardiovascular diseases is obvious.

Key words: cardiovascular risk, cardiovascular diseases, rheumatoid arthritis, gender

РЕВМАТОИДТЫ АРТРИТПЕН АУЫРАТЫН НАУҚАСТАРДА ЖЫНЫСЫНА БАЙЛАНЫСТЫ ЖҮРЕК-ҚАН ТАМЫРЛАРЫ АУРУЛАРЫНЫҢ ДАМУ ҚАУІП ФАКТОРЛАРЫН ТАЛДАУ

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ТҰЖЫРЫМДАМА

Кіріспе: Ревматоидты артрит жүрек-қан тамырлары ауруларының даму қаупінің қолайсыз факторы деп танылды.

Зерттеудің мақсаты: Ревматоидты артритпен ауыратын науқастардың жынысына байланысты жүрек-қан тамырлары ауруларының дәстүрлі қауіп факторларының құрылымы мен жиілігін анықтау.

Материал және әдістер: ACR/EULAR 2010 диагностикасының критерийлері бойынша 70 пациенттің (23 ер адам, 47 әйел адам) ауру тарихы талданды. Жүрек-қан тамыр қауіпін бағалау үшін SCORE шкаласы қолданылды. Ревматоидты артрит ұзақтығы 10 жылдан астам, ревматоидты фактор бойынша серопозитивті және циклдік цитруллинді пептидке антиденелері бар, EULAR ұсыныстарына сәйкес жүйелі көріністері бар емделушілерде score/EULAR бейімделген моделі пайдаланылады; тәуекел 1,5 коэффициентін ескере отырып қайта есептеледі. Зерттеу деректері Microsoft Office Excel 2010 және IBM SPSS 21 статистикалық бағдарламалары арқылы өңделді.

Нәтижелер: Әйелдер $p < 0,01$ кезінде ерлерге қарағанда 4,3% және 60,9% аз темекі шегеді. Сонымен қатар ерлерде артериалды гипертензия жиілігі әйелдерге қарағанда 65,2% және 40,4% жоғары. Ерлерде жас факторы 78,3% және 44,4%, $p < 0,01$ басым. Пациенттердің жынысына байланысты жүрек-қан тамырлары аурулары тәуекелінің басқа да факторлары арасындағы айырмашылық шамалы болды. Жалпы холестериннің орташа мәні ($M \pm SD$) ерлер мен әйелдер арасында $5,58 \pm 0,98$, $5,64 \pm 0,91$, $p > 0,05$ анық айырмашылығы жоқ. Зерттеу барысында дене салмағының индексін талдау әйелдердің дене массасының индексі ерлерден ($M \pm SD$) $28,1 \pm 6,3$, $26,6 \pm 3,8$ жоғары болғанын көрсетті. Дене массасының индексінде жынысы бойынша айырмашылық дұрыс болды ($p < 0,05$). Жыныстық ерекшелігіне байланысты еркектерде систолалық қан қысымы/ диастолалық қан қысымы орташа мәні әйелдерге қарағанда ($136,7 \pm 13,1 / 86 \pm 7$ және $129 \pm 16,7 / 82,2 \pm 8,5$) жоғары болды және статистикалық мәні ($p < 0,05$). жүрек-қан тамырлары аурулары төмен және орташа қауіп бар әйелдер ерлермен салыстырғанда (8,7% және 30,4%) басым (21,3% және 57,4%). Ерлердің көпшілігі жоғары және өте жоғары тәуекелге ие болды (21,7% және 39,1%), ал әйелдер саны аз болды (6,4% және 14,9%). Ерлер мен әйелдер арасында жүрек-қан тамырлары аурулары қауіп бар, яғни хи-квадрат өлшемі бойынша өлшенген $r = 0,012$ ($p < 0,05$) шынайы корреляция анықталды.

Қорытынды: Осылайша, егер ревматоидты артрит науқастарын емдеу кезінде жүрек-қан тамырлары аурулары алдын алу үшін бірінші қадам дәстүрлі қауіп факторларын жеткілікті түзету болып табылмаса, онда жүрек-қан тамырлары аурулары асқынұларының дамуы мүмкін. Сонымен қатар ревматоидты артрит жүрек-қан тамырлары аурулары дамуына әсері анық.

Негізгі сөздер: жүрек-қан тамырлары қауіп, жүрек-қан тамырлары аурулары, ревматоидты артрит, жынысы

АНАЛИЗ ФАКТОРОВ РИСКА РАЗВИТИЯ СЕРДЕЧНО-СОСУДИСТЫХ ЗАБОЛЕВАНИЙ У БОЛЬНЫХ РЕВМАТОИДНЫМ АРТРИТОМ В ЗАВИСИМОСТИ ОТ ПОЛА

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РЕЗЮМЕ

Введение: Ревматоидный артрит признан неблагоприятным фактором риска развития сердечно-сосудистых заболеваний.

Цель исследования: Определить структуру и частоту встречаемости традиционных факторов риска сердечно-сосудистых заболеваний в зависимости от пола у больных ревматоидным артритом.

Материал и методы: Проанализированы истории болезни 70 пациентов (мужчин $n=23$, женщин $n=47$) по критериям диагностики ACR/EULAR 2010. Для оценки сердечно-сосудистого риска использовалась шкала SCORE. У пациентов с длительностью ревматоидного артрита более 10 лет, серопозитивных по ревматоидному фактору и антителам к циклическому цитруллиновому пептиду (АЦЦП), с системными проявлениями согласно рекомендациям EULAR, используется адаптированная модель SCORE/EULAR; риск пересчитывается с учетом коэффициента 1,5. Данные исследования были обработаны с помощью статистических программ Microsoft Office Excel 2010 и программы IBM SPSS 21.

Результаты: Женщин с ревматоидным артритом, которые курят меньше (4,3%), чем мужчин (60,9%) при $p < 0,01$. В то же время частота артериальной гипертензии у мужчин выше, чем у женщин 65,2% и 40,4%. У мужчин возрастной фактор превалирует 78,3% и 44,4%, $p < 0,01$. В зависимости от пола пациентов разница между другими факторами риска сердечно-сосудистых заболеваний была незначительной. Среднее значение общего холестерина ($M \pm SD$) достоверно не различалось между мужчинами и женщинами $5,58 \pm 0,98$, $5,64 \pm 0,91$, $p > 0,05$. В ходе исследования анализ индекса массы тела показал, что индекса массы тела женщин был выше, чем у мужчин ($M \pm SD$) $28,1 \pm 6,3$, $26,6 \pm 3,8$. Разница индекса массы тела по полу была достоверной ($p < 0,05$). В зависимости от половой специфичности среднее значение систолического артериального давления диастолического артериального давления у мужчин было выше, чем у женщин ($136,7 \pm 13,1 / 86 \pm 7$ и $129 \pm 16,7 / 82,2 \pm 8,5$) и статистически значимо ($p < 0,05$). Женщины с низким и средним риском сердечно-сосудистых заболеваний преобладали (21,3% и 57,4%) по сравнению с мужчинами (8,7% и 30,4%). Большинство мужчин имели высокий и очень высокий риск (21,7% и 39,1%), в то время как женщины были в меньшем количестве (6,4% и 14,9%). Выявлена статистически значимая корреляция между мужчинами и женщинами с риском сердечно-сосудистых заболеваний, т. е. $r = 0,012$.

Вывод: Таким образом, если первым шагом для профилактики сердечно-сосудистых заболеваний при лечении больных ревматоидного артрита не является достаточная коррекция традиционных факторов риска, то возможно развитие осложнений сердечно-сосудистых заболеваний. В то же время влияние ревматоидного артрита на развитие сердечно-сосудистых заболеваний очевидно.

Ключевые слова: сердечно-сосудистый риск, сердечно-сосудистые заболевания, ревматоидный артрит, пол

Introduction

Rheumatoid arthritis (RA) is one of the most actual problems of modern medicine, which is widespread among adult people, which negatively affects the quality of life and span. According to some authors, the frequency of spreading RA around the world varies from about 0.5% to 1-2%. As a rule, RA occurs 2-5 times more frequent for women than for men. Therefore, the ratio of occurrence of RA in male and female is

1:(2.5-3) [1]. In 2016, in the Republic of Kazakhstan, the total number of registered patients was more than 64,000 patients with rheumatoid arthritis (RA). The dynamics of the increase in the total incidence of RA for the analyzed period was up to 60% [2].

In modern medicine, RA is recognized to be an adverse risk factor of cardiovascular diseases (CVD) [1]. In addition to traditional risk factors, RA can be considered as an independent

factor of cardiovascular disorders [3,4,5,6]. That is the risk is high, as in the case with diabetes mellitus (DM) and arterial hypertension (AH) [7,8].

The aim of the study is to determine the structure and frequency of occurrence of traditional risk factors of cardiovascular diseases, depending on the gender of patients with rheumatoid arthritis. Determining the general risk of cardiovascular complications that may occur in SCORE and SCORE / EULAR for the next 10 years.

Material and methods

The study was conducted in the division of arthrology of the Scientific Research Institute of Traumatology and Orthopedics at the Family Medicine Department at Astana Medical University in Nur-Sultan, Republic of Kazakhstan. The case histories of 70 patients (men n-23, women n-47) according to the criteria of the diagnosis of ACR/EULAR 2010 were analyzed. The study focuses on the frequency and structure of the main traditional risk factors leading to the development of cardiovascular diseases. Based on the anamnesis, clinical,

laboratory and instrumental examination results of patients with RA, we have been able to study the traditional risk factors of cardiovascular pathology related to atherosclerosis. The main risk factors for cardiovascular diseases are the gender and age of the patient (men are 45 years old, women over 55 years), smoking, body weight excess, total cholesterol levels of 5 mmol/L, early development of CVD, postmenopausal stage, additional diseases: arterial hypertension, type II diabetes mellitus, glucose tolerance disorder [9].

Unlike patients with a known diagnosis of CVD, all other patients were assessed for CVD risk using the SCORE scale for high-risk countries. Relative risk was determined for patients under 40 years of age. In patients with RA duration of more than 10 years, seropositive for rheumatoid factor and antibodies to cyclic citrulline peptide (ACCP), with systemic manifestations according to the recommendations of EULAR, an adapted SCORE/EULAR model is used; risk is recalculated taking into account the coefficient of 1.5. CVD risk categories were determined using Table 1.

Table 1 Cardiovascular risk categories

Risk category	Indicators
Very high	<ul style="list-style-type: none"> Documented CVD, clinical or unequivocal on imaging. Documented clinical CVD includes previous AMI, ACS, coronary revascularization and other arterial revascularization procedures, stroke and TIA, aortic aneurysm and PAD. Unequivocally documented CVD on imaging includes plaque on coronary angiography or carotid ultrasound. It does NOT include some increase in continuous imaging parameters such as intima-media thickness of the carotid artery. DM with target organ damage such as proteinuria or with a major risk factor such as smoking or marked hypercholesterolaemia or marked hypertension. Severe CKD (GFR <30 mL/min/1.73 m²). A calculated SCORE ≥10%.
High	<ul style="list-style-type: none"> Markedly elevated single risk factors, in particular cholesterol >8 mmol/L (>310 mg/dL) (e.g. in familial hypercholesterolaemia) or BP ≥180/110 mmHg. Most other people with DM (with the exception of young people with type 1 DM and without major risk factors that may be at low or moderate risk). Moderate CKD (GFR 30–59 mL/min/1.73 m²). A calculated SCORE ≥5% and <10%
Moderate	<ul style="list-style-type: none"> SCORE is ≥1% and <5% at 10 years. Many middleaged subjects belong to this category.
Low	<ul style="list-style-type: none"> SCORE <1%

Note: Adopted from European Guidelines on cardiovascular disease prevention in clinical practice (version 2016)

Criteria for inclusion of patients in the study

RA was diagnosed in accordance with the classification criteria of the American Association of rheumatologists and European rheumatologists in 2010; age over 18 years; availability of results of clinical, laboratory and instrumental studies, the duration of the disease exceeds 1 year.

Criteria for excluding patients to the study

Presence of additional inflammatory joint diseases from the group of diffuse connective tissue diseases; patients with severe comorbidities (II-IV groups of NYHA chronic heart failure, II-III degree of chronic respiratory failure, chronic kidney failure, oncological and lymphoproliferative diseases); stages of exacerbation of chronic diseases of the gastrointestinal tract and urogenital tract; the presence of pregnancy; patients receiving surgical treatment in connection with the RA.

These studies were processed using statistical programs the Microsoft Office Excel 2010 and the IBM SPSS 21 program. Quantitative indicators are presented as a mean and standard deviation (M±SD). Qualitative indicators in the form of absolute (n) and relative values (%). To check for statistical significance was used the nonparametric tests Mann-Whitney

and for comparison of frequencies the Chi-square. Statistical significance values were used as p<0,05.

Clinical characteristics of patients involved in the study are given in Table 2.

As shown in Table 2, there are 32.9% males among the patients with RA and 67.1% females, i.e. gender ratio is 1:2 on average, that corresponds to general trends [9,16]. The mean age of the patients was 53.71 ± 10.45, 53.22 ± 12.14 in men and 53.96 ± 9.65 in women, respectively. The mean age between men and women did not differ significantly (p=0,202). The mean duration of the disease was almost equal in men it was 9.82±5.14 and for women it was 10.12±6.78 years. In most patients, DAS28 was significantly higher in RA activity, i.e. DAS28=78.26% for men over 5.1 and 80.9% for women; average activity (DAS28=3.2-5.1) was 17.4% for males and 17.0% for females; and there was only one female and one male with lower activity (DAS28<3.2). There were most patients with the second and third degree of disease activity. Over 80% of patients with RA had high activity of disease, which is the indication for hospital treatment but also a special factor in the development of CVD diseases.

Thus, our patients have the typical characteristics of RA that require medical care in clinical practice.

Table 2 General characteristics of patients

Indicators	Explanation	Patients with RA, n = 70	
		Men (n = 23),%	Women (n = 47),%
Age	M (SD)	53.21±12.14	53.95±9.65
Duration of the disease	M (SD)	9.82±5.14	10.12±6.78
Degree of activity of RA on DAS28	< 3.2 3.2 - 5.1 > 5.1	1 (4.34) 4 (17.4) 18 (78.26)	1 (2.1) 8 (17) 38 (80.9)
Radiological stage	IV III II I	9 (39.1) 6 (26.1) 8 (34.78) -	16 (34) 21 (44.7) 10 (21.3) -
Functional insufficiency of joints	1 2 3 4	- 9 (39.13) 14 (60.87) -	- 24 (51.1) 23 (48.9) -
RF (rheumatoid factor)	Seropositive Seronegative	16 (69.6) 7 (30.4)	46 (97.9) 1 (2.1)
ACCP	ACCP is positive ACCP is negative	14 (60.9) 9 (39.1)	37 (78.7) 10 (21.3)
Non-skeletal manifestations	Yes No	14 (60.9) 9 (39.1)	23 (48.9) 24 (51.1)
VAS (visual analog scale)	Up to 25 mm Up to 50 mm Up to 75 mm Up to 100 mm	- 2 (8.7) 16 (69.6) 5 (21.7)	- 4 (8.5) 36 (76.6) 7 (14.9)
Frequency of administration of basic drugs	Metoject/Methotrexate Leflunomide Sulfasalazine Plaquenil Combinations treatment	17 (74) 1(4.3) 1(4.3) 3 (13.1) 1(4.3)	38 (80.9) 5(10.6) 2(4.25) 2(4.25) -
Frequency of administration of corticosteroid medications	n=45	14 (60.8)	31 (65.9)
Daily dose of corticosteroids	≤ 7.5 mg /day > 7.5 mg /day	5 (35.7) 9 (64.3)	9 (29) 22 (71)
NSAID	- continuously - on demand	22 (95.7) 1 (4.3)	43 (91.5) 4 (8.5)

Results

Of the patients who participated in the study, 2.9% (n=2) did not have CVD factors. Patients with one risk factor were 4.3% (n=3). In our work, attention has been paid to a number of factors, especially in one patient. There were 37 (52.8%) patients with two or three different factors - 27 patients (38.6%) and many factors (4-6). There was one case with 7 factors (1.4% of patients) that led to the development of atherosclerosis. According to the literature, in comparison with the presence of one risk factor for CVD, the combination of several risk factors, even if they are not pronounced, lead to serious consequences [8,10,11].

According to Figure 1, it clearly shows the share of non-modifiable risk factors. Among patients with identified CVD in the frequency of occurrence of risk factors in the first place are the body mass index (BMI) of more than 25 kg/m² in 68.6%, hypercholesterolemia (60%), arterial hypertension (48.6%), menopausal women (58.6%), the effect of age in 55.7% (45 years for males and 55 years for women).

Similarly, in research by Klochkova GV in 2010 in the study of patients with RA (n=68) there were hypercholesterolemia (70.6%), AH (52.9%), excess of BMI (70.6%), and the

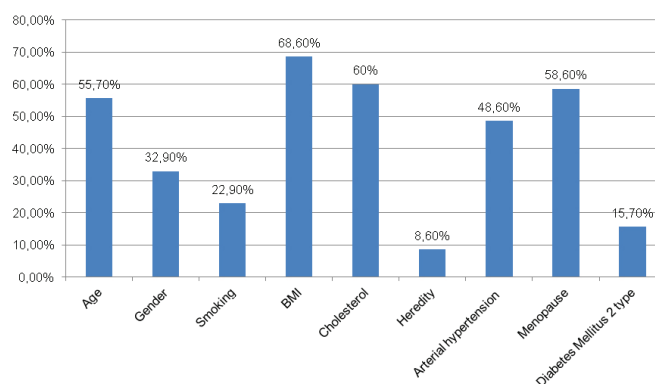


Figure 1 - Structure of CVD Risk Factors in Rheumatoid Arthritis

inheritance by CVD (74.4%) [11]. In our study, inheritance by CVD showed a minimal percentage compared to the other risk factors.

The frequency of risk factors by gender is presented in Table 3.

Women with RA are less smokers than men (4.3% and 60.9%, p<0.01). At the same time, the frequency of AH is higher

Table 3

Features of traditional risk factors for cardiovascular disease in patients with rheumatoid arthritis depending on gender (n=70)

Risk factors	Frequency of risk factors in men and women n (%)	
	Men n (%)	Women n (%)
Age (45 years for males and 55 years for females)	18 (78.3) **	21 (44.7)
Menopause in women	-	41 (87.2)
Smoking	14 (60.9) **	2 (4.3)
Total cholesterol >5 mmol/l	14 (60.9)	28 (59.6)
SBP above 140 mm Hg	15 (65.2) *	19 (40.4)
Diabetes Mellitus 2 type	2 (8.7)	3 (6.4)
impaired glucose tolerance	0	6 (12.8)
Body Mass Index > 25 (kg / m ²)	16 (69.6)	32 (68.1)
Early development of CVD in heredity	2 (8.7)	4 (8.5)

Note: * $p < 0.05$, ** $p < 0.01$.

in men than in women (65.2% and 40.4%). In men the age factor is in the first row (78.3% and 44.4%, $p < 0.01$). Despite the low frequency of CVD heredity, statistically significant indicators were observed for AH ($p < 0.05$). Depending on the gender of the patients, the difference among other CVD risk factors was insignificant.

According to Table 3, there is a meaningful difference between gender of patients.

Table 4 shows the mean of the total cholesterol in blood serum ($M \pm SD$), depending on gender of patients with RA. According to the table the mean value of the total cholesterol in patients was 5.62 ± 0.92 (mmol / l).

The mean of the total cholesterol ($M \pm SD$) did not differ significantly between men and women (5.58 ± 0.98 , 5.64 ± 0.91 , $p > 0.05$).

In the study, body weight index analysis showed that

Table 4

The mean value of total cholesterol (n=70) depending on gender of patients with RA

Total cholesterol (mmol / l)		
The mean ($M \pm SD$)		5,62±0,92
Characteristics according to gender		
Men (n=23)	Women (n=47)	(p)
5.58±0.98	5.64±0.91	0.777

the BMI of women were higher than men ($M \pm SD$ 28.1±6.3, 26.6±3.8). The difference in BMI by gender was significant ($p < 0.05$).

Table 6 shows the mean arterial blood pressure ($M \pm SD$). The mean value of systolic blood pressure in general patients was 131.6 ± 15.9 mm Hg and diastolic blood pressure 83.5 ± 8.2 mm Hg. Consequently, the average value of arterial blood pressure corresponds to the normal level. Depending on gender specificity, the mean value of SBP/DBP was higher in men than in women ($129 \pm 16.7 / 82.2 \pm 8.5$ and $136.7 \pm 13.1 / 86 \pm 7$) and statistically significant ($p < 0.05$).

Although in patients with RA there are different atherosclerosis factors, each of them, independently, contributes to the development of coronary heart disease and leads to complications of CVD. Therefore, we predicted the risk of complications of CVD complications due to atherosclerosis in the next decade. The general risk for SCORE scale includes systolic arterial blood pressure, total cholesterol, age, gender and smoking. Table 7 presents the conventional SCORE scale for cardiovascular risk and its correction according to EULAR guidelines (SCORE/EULAR).

Table 5

The mean of the BMI in patients depending on gender (n=70)

Body Mass Index (kg / m ²)		
The mean ($M \pm SD$)		27,6±5,6
Characteristics according to gender		
Men (n=23)	Women (n=47)	(p)
26.6±3,8	28.1±6,3	(0.021)*

Note: $p < 0.05$.

Table 6

Characteristics of arterial blood pressure in patients with RA (n=70)

Arterial blood pressure (ABP)			
Sign	The mean value of the ABP ($M \pm SD$)		
SBP	131.6±15.9		
DBP	83.5±8.2		
The mean value of ABP according to gender ($M \pm SD$)			
Sign	Men (n=23)	Women (n=47)	p
SBP	136.7±13.1	129±16.7	(0.043)
DBP	86±7	82.2±8.5	(0.039)

Table 7

The SCORE scale with general risk of CVD in patients and correction according EULAR recommendation (SCORE/EULAR)

Sign	Patient risk (n,%)				p
	≤1	>1 and <5	≥5 and <10	≥10	
SCORE	28(54,9)	18 (35,3)	4 (7,8)	1 (2)	0,000 ***
SCORE/EULAR	10(19,6)	37 (72,5)	1 (2)	3 (5,9)	0,000 ***

Note: *** $p < 0.001$

With SCORE scales we have identified the risk levels for severe CVD in the next 10 years. In most of the patients with RA (54.9%), there was a lower risk of CVD ($\leq 1\%$). On the contrary, SCORE scale $> 5\%$ was 9.8% in patients.

The SCORE scale did not include cases of acute cerebrovascular insufficiency, type II diabetes mellitus, and coronary heart disease ($n=19$) because their risk (Table 1) is high and very high risk of CVD.

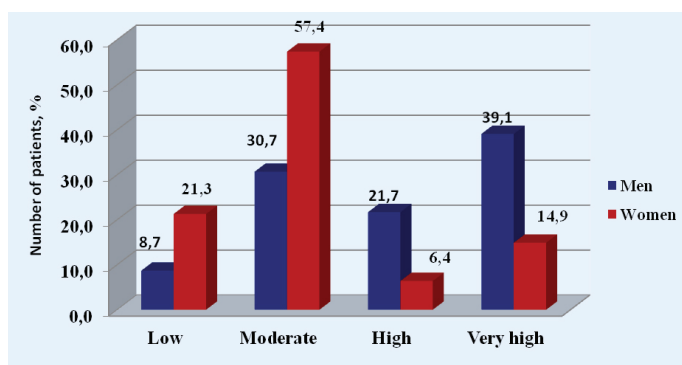


Figure 2 - Structure of CVD risk depending on gender in patients with RA

Note: $p < 0.05$.

Characteristics of the CVD risk factors of patients are shown in Figure 2.

Women with low and middle risk of CVD prevailed (21.3% and 57.4%) than men (8.7% and 30.4%). The majority of men had a high and very high risk (21.7% and 39.1%), while women were in a smaller number (6.4% and 14.9%). There was a significant correlation between the men and women with the CVD risk, i.e., the $p=0,012$ ($p < 0,05$) measured by the chi-squared criterion.

Discussion

There are atherosclerosis-related diseases of the cardiovascular system in rheumatoid arthritis: multiple lesions of the coronary arteries, early recurrence of coronary syndrome, mortality in myocardial infarction for the first time, the frequency of "asymptomatic" myocardial infarction, increased risk of myocardial infarction to clinical manifestations of rheumatoid arthritis (including "asymptomatic"), the relationship of CVD with the activity of inflammation (persistent increase in CRP and ESR, the presence of extra-articular manifestations), vascular lesions "subclinical" atherosclerosis (endothelial dysfunction, thickening of intima-media complex, coronary artery calcification), detection of previously critical stenosis in coronary artery pathomorphology of obvious signs of inflammation and instability of atherosclerotic plaque [12-14].

Many studies have shown the role of traditional risk factors for atherosclerotic lesions in RA. The most frequent cases of risk factors are hypertension, hyperlipidemia and smoking. Meta-analysis data for assessing the impact of traditional CVD risk factors in rheumatoid arthritis report that arterial hypertension, type 2 diabetes, smoking, hyperlipidemia and obesity increase

the risk of CVD complications in these patients by 1.5-2.5 times [15].

According to the concept of modern rheumatology, the main reason for the high risk of CVD in RA patients is the appearance of general immunopathological mechanisms of atherosclerosis and chronic autoimmune inflammation. Besides the fact that markers of inflammation are manifestations of chronic autoimmune inflammatory process activity in RA, many of them are considered as predictors of CVD complications [16].

There is very little information about gender differences in cardiovascular diseases in rheumatoid arthritis in the literature. In one of the most recent works recently published, there was found significantly worst lesion of atherosclerosis in male RA patients compared with female RA patients. This study showed high and very high risk of fatal CVD in most male RA patients [17].

According to the study by Albrecht K., including the meta-analyses, observational studies and reviews there are gender-specific differences in the comorbidities of RA. Depression, fibromyalgia and hypothyroidism are more frequent in women than in men, whereas cardiovascular diseases and diabetes are more common in men. Osteoarthritis and osteoporosis are frequent in both genders [18].

Castañeda S. et al., analyzed the influence of gender on the clinical expression of cardiovascular manifestations associated to inflammatory joint diseases. The following conclusion was made that men with rheumatoid arthritis (RA) have a higher risk of pericarditis, ischemic heart disease, heart failure (HF) with reduced ejection fraction (EF), and CV mortality than women with RA. We need much research to identify the implication of gender in the risk of CV disease in these patients [19].

Conclusion

Thus, some peculiarities depending on gender in patients with rheumatoid arthritis and their influence to the development of CVD were discussed. In our study, patients were found to have a combination of several risk factors for CVD (1-7). According to the structure of CVD risk factors, most of them are represented by modifiable risk factors. It is important to adjust the scale SCORE using the SCORE/EULAR when it detects the general risk of cardiovascular disease in patients with RA. In our study, the risk level of RA patients has changed after the correction of the SCORE and SCORE/EULAR with a slight increase in the risk ratio of 2.05-2.95 times ($p < 0.001$). There was a high and very high risk category in men than women ($p < 0.05$)

So, if the first step for prevention of CVD in the treatment of patients with RA is not sufficient correction of traditional risk factors, it is possible to develop complications of CVD. At the same time, the impact of RA on the development of CVD is obvious.

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