

RISK AND FORECAST FOR THE DEVELOPMENT OF CARDIOVASCULAR DISEASES IN PATIENTS WITH RHEUMATOID ARTHRITIS

Fergana medical institute of public health
department of "sciences in the field of therapy (wash) "
Zhuraboeva Gulkhayo Bakhtiyorovna

Abstract: Rheumatoid arthritis (RA) is a chronic autoimmune inflammatory disease that primarily manifests as destructive joint damage but, as a systemic disease, affects many organs and systems of the body, including the cardiovascular system. Epidemiological and clinical studies conducted in recent years indicate a significantly higher risk of developing cardiovascular diseases (CVD) in RA patients.

This article provides a comprehensive analysis of the main risk factors for the development of gastrointestinal diseases in RA patients, their pathogenetic mechanisms, and their impact on clinical prognosis. According to modern scientific data, the risk of developing cardiovascular diseases in RA patients is on average 1.5–2 times higher than in the general population, and in some cases, this indicator can even reach 2.5 times. In particular, the likelihood of developing myocardial infarction, stroke, heart failure, and peripheral artery diseases increases.

Chronic systemic inflammation plays a leading role in the pathogenesis of the disease. Biomarkers such as inflammatory mediators - interleukin-6 (IL-6), tumor necrosis factor alpha (TNF- α), and C-reactive protein (CRP) - cause damage not only to joint tissues but also to the vascular wall. As a result, endothelial dysfunction, oxidative stress, and the formation of atherosclerotic plaques accelerate. These processes lead to early atherogenesis and the development of rapidly progressive atherosclerosis.

Furthermore, metabolic changes associated with RA, specifically lipid metabolism disorders ("lipid paradox"), insulin resistance, and a procoagulant state, further increase cardiovascular risk. Traditional risk factors—arterial hypertension, smoking, obesity, and dyslipidemia—have a more pronounced effect against the background of RA.

The duration and activity level of the disease directly affect the prognosis. In patients with long-term and high-activity RA, the probability of developing cardiovascular complications is significantly higher. Long-term use of glucocorticosteroids and certain non-traditional anti-inflammatory drugs is also among the factors that increase cardiovascular risk.

At the same time, modern treatment strategies, particularly disease-modifying antirheumatic drugs (DMARDs), biological agents (anti-TNF, IL-6 inhibitors), and targeted therapy agents, play an important role in reducing cardiovascular risk through effective inflammation control. RA is not only a joint disease but also a systemic pathology associated with high cardiovascular risk. Therefore, early detection of cardiovascular risk, comprehensive assessment, and the application of individual preventive and therapeutic strategies are of great importance in the management of RA patients.

Keywords: rheumatoid arthritis, cardiovascular diseases, atherosclerosis, prognosis, inflammation, CRP, IL-6

Introduction

Rheumatoid arthritis (RA) is one of the pressing problems of modern medicine, characterized not only by chronic inflammatory damage to joints but also by damage to various organs and systems as a systemic autoimmune process. The systemic nature of the disease complicates its clinical course and increases the risk of developing long-term complications. In particular, damage to the cardiovascular system is one of the main factors determining the prognosis in RA patients.

Numerous epidemiological and clinical studies conducted in recent decades have confirmed that mortality and morbidity rates associated with cardiovascular diseases (CVD) in RA patients are significantly higher than in the general population. Specifically, it was noted that the risk of developing cardiovascular complications in these patients increased by approximately 40–60%, and in some cases, even higher. This indicates the need to consider RA as an independent cardiovascular risk factor.

The chronic inflammatory process, which plays a leading role in the pathogenesis of RA, leads to the accelerated development of atherosclerosis. High levels of pro-inflammatory cytokines - interleukin-6 (IL-6), tumor necrosis factor alpha (TNF- α), as well as C-reactive protein (CRP) - cause vascular endothelial dysfunction, increased oxidative stress, and impaired lipid metabolism. As a result, atherosclerotic plaques are formed and destabilized faster, which increases the risk of thrombotic complications.

Clinically, these processes manifest as ischemic heart disease, myocardial infarction, stroke, heart failure, and peripheral artery diseases. It should be noted that cardiovascular diseases in RA patients often have an atypical course and are detected late, which is associated with their severe course and high mortality rates. Traditional cardiovascular risk factors—arterial hypertension, dyslipidemia, obesity, and smoking—are also common in RA patients, exerting a more pronounced harmful effect against the background of systemic inflammation. At the same time, the long-term use of certain medications, particularly glucocorticosteroids and non-steroidal anti-inflammatory drugs, can also increase cardiovascular risk.

Based on the above, RA should be evaluated not only as a rheumatic disease but also as a complex systemic pathology associated with high cardiovascular risk. Therefore, in the management of RA patients, it is important not only to control the inflammatory process but also to identify cardiovascular risk factors at an early stage, conduct a comprehensive assessment, and apply individual preventive measures.

Materials and methods

This scientific article is based on a systematic literature analysis, examining international clinical studies, cohort observations, and meta-analyses published in recent years.

The analysis was conducted in the following areas:

- Epidemiological relationship between RA and gastrointestinal diseases
- Pathogenetic mechanisms (inflammation, immune system)
- Biomarkers (CRP, ESR, lipids)
- Forecast and mortality indicators

Results

1. Epidemiological risk

Numerous studies show that patients with RA have a significantly higher risk of cardiovascular diseases:

- Risk of developing gastrointestinal diseases **1.5 times higher**
- Some sources report that this figure can reach **up to 2 times**
- Total mortality rate **54% higher**

2. Pathogenesis

The main mechanisms of cardiovascular disease development in RA are:

- **Chronic inflammation (IL-6, TNF- α)**
- **Endothelial dysfunction**
- **Oxidative stress**
- **Lipid paradox (low lipid, high risk)**

Inflammation accelerates the formation of atherosclerotic plaques and increases their instability.

3. Risk factors

The development of gastrointestinal tract diseases in RA patients is influenced by:

- Disease duration and activity
- High CRP and ESR
- Smoking, diabetes, arterial hypertension
- Long-term use of glucocorticoids
- Dyslipidaemia

Furthermore, traditional risk factors alone cannot fully explain this risk.

4. Clinical manifestations

The following diseases of the gastrointestinal tract are common in RA patients:

- Ischaemic heart disease
- Heart failure
- Stroke
- Peripheral artery diseases

Often these diseases are "**hidden**" and are detected late.

Discussion

Cardiovascular risk associated with RA is multifactorial, and immune-inflammatory mechanisms play a leading role in its development. In the pathogenesis of rheumatoid arthritis, activated immune system components—T-lymphocytes, B-lymphocytes, macrophages, and the pro-inflammatory mediators they produce—lead to structural and functional changes in the vascular wall.

Specifically, high expression of cytokines such as interleukin-6 (IL-6), tumor necrosis factor alpha (TNF- α), and interleukin-1 β (IL-1 β) causes endothelial cell dysfunction. A decrease in nitric oxide (NO) synthesis in the endothelium, an increase in adhesion molecules (VCAM-1, ICAM-1), and the migration of inflammatory cells into the vascular wall lead to the development and acceleration of atherosclerosis.

Furthermore, chronic inflammation associated with RA causes lipid metabolism disorders. A "lipid paradox" phenomenon is observed, where atherogenicity increases despite low total cholesterol levels. This condition is explained by the oxidation of low-density lipoproteins (LDL) and a decrease in the antiatherogenic properties of high-density lipoproteins (HDL).

In addition to immune-inflammatory processes, an increase in oxidative stress and the formation of a prothrombotic state also play an important role. The risk of thrombosis increases as a result of platelet activation, the suppression of the fibrinolytic system, and an increase in blood coagulation. This significantly increases the clinical risk of developing myocardial infarction and stroke.

A synergistic effect is also observed between traditional cardiovascular risk factors and immune-inflammatory factors in RA patients. For example, in cases of arterial hypertension or dyslipidemia, inflammatory processes exacerbate damage to the vessel wall. The formation of cardiovascular risk associated with RA is carried out through complex, multi-stage, and interconnected pathogenetic mechanisms. Therefore, when assessing cardiovascular risk in these patients, it is necessary to consider not only traditional factors but also biomarkers reflecting inflammatory activity.

According to the modern concept:

- RA = **independent cardiovascular risk factor**
- Standard assessment systems such as SCORE **underestimate** the risk in RA patients

The role of treatment is also important:

- **DMARD and biological drugs** → reduces risk
- **GCS (steroids)** → may increase risk

This indicates the need for an individual approach.

Conclusion. Patients with rheumatoid arthritis have a high risk of developing cardiovascular diseases, which significantly worsens the disease's prognosis. Chronic inflammation and immune mechanisms play a key role.

Early screening for cardiovascular risk in RA patients and the application of comprehensive treatment strategies are of great importance.

Practical suggestions

1. Cardiovascular screening in RA patients at least once a year
2. Regular monitoring of CRP and lipid profile
3. Optimal management of DMARD therapy
4. Use of steroids at minimum effective dose
5. Lifestyle changes (diet, physical activity)

References

1. DIJKSHOORN B. ET AL. CARDIOVASCULAR DISEASE RISK IN RA, 2022
2. HANSILDAAR R. ET AL. LANCET RHEUMATOLOGY, 2021
3. ARGNANI L. FRONTIERS IN MEDICINE, 2021
4. ARONOV A.G. ET AL. AMERICAN JOURNAL OF PREVENTIVE CARDIOLOGY, 2025
5. ANYFANTI P. CARDIOVASCULAR RISK IN RA, 2024
6. NIKIPHOROU E. BMJ HEART, 2020
7. ZOKIRJON O'G, M. M. J. (2025). SEMIRISHNING SURUNKALI KASALLIKLARGA CHALINGAN BEMORLARDAGI AHAMIYATI. *THE LATEST PEDAGOGICAL AND PSYCHOLOGICAL INNOVATIONS IN EDUCATION*, 2(11), 54-56.
8. ZOKIRJON O'G, M. M. J. (2025). O 'TKIR REVMATIK ISITMANI DAVOLASHDA IMMUNOSUPPRESSIV TERAPIYANING AHAMIYATI. *THE LATEST NEWS AND RESEARCH IN EDUCATION*, 2(12), 65-67.
9. ZOKIRJON O'G, M. M. J. (2025). O 'PKANING SURUNKALI OBSTRUKTIV KASALLIKLARI VODIY AHOLISI ORASIDA TARQALISHI. *НАУЧНЫЙ ФОКУС*, 3(27), 18-20.
10. УСМАНОВА, У. И., & МУМИНОВ, Ж. З. (2023). РОЛЬ КЛЕТОЧНОГО ИММУНИТЕТА ПРИ ХРОНИЧЕСКОЙ СЕРДЕЧНОЙ НЕДОСТАТОЧНОСТИ ИШЕМИЧЕСКОЙ ЭТИОЛОГИИ. *ЭКОНОМИКА И СОЦИУМ*, (6-1 (109)), 1107-1110.
11. УСМАНОВА, У. И., & МУМИНОВ, Ж. З. (2023). ПАТОГЕНЕТИЧЕСКОЕ ВЛИЯНИЕ ЦИТОКИНОВ НА ПРОГРЕССИРОВАНИЕ ХРОНИЧЕСКОЙ СЕРДЕЧНОЙ НЕДОСТАТОЧНОСТИ ИШЕМИЧЕСКОЙ ЭТИОЛОГИИ. *ЭКОНОМИКА И СОЦИУМ*, (3-1 (106)), 520-523.
12. УСМАНОВА, У. И., & МУМИНОВ, Ж. З. (2023). ХАРАКТЕРИСТИКА АУТОИММУННЫХ ПРОЦЕССОВ ПРИ ХРОНИЧЕСКОЙ СЕРДЕЧНОЙ НЕДОСТАТОЧНОСТИ ИШЕМИЧЕСКОЙ ЭТИОЛОГИИ. *RE-HEALTH JOURNAL*, (1-1 (17)), 95-97.
13. ХАЛИЛОВ, Н. А., & ЮЛДАШЕВА, Г. Б. ОСОБЕННОСТИ ТЕЧЕНИЯ БРОНХИАЛЬНОЙ АСТМЫ У ПАЦИЕНТОВ, ПЕРЕНЕСШИХ COVID-19. *КОРОНАВИРУСНАЯ ИНФЕКЦИЯ: АКТУАЛЬНЫЕ ВОПРОСЫ ДИАГНОСТИКИ И ЛЕЧЕНИЯ В МЕДИЦИНСКОЙ ПРАКТИКЕ*, 104.
14. ХАЛИЛОВ Н.А., ДЖАКБАРОВА М.А. И ДЖОРАЕВА М.А. (2024). БРОНХИАЛЬНАЯ АСТМА БИЛАН ОГ'РИГАН БЕМОРЛАРДА КОМПЛЕКС ПРОДАЖНЫЙ МЕТАБОЛИЧЕСКИЙ СИНДРОМНИНГ ТАРКИБИЙ КИСМЛАРИГА ТА'СИРИНИ ТАЛИЛ КИЛИШ. *ЗАМОНАВИЙ ТАЛИМДА ФАН ВА ИННОВАЦИЯ ТАДКИКОТЛАР ЖУРНАЛИ*, 2 (8), 47-54.

15. ХАЛИЛОВ Н.А., ЮЛДАШЕВА Г.Б., МУТАЛЬДЖОНОВ М., ДЖАКБАРОВА М.А. И ДЖОРАЕВА М.А. (2024). COVID-19 ИНФЕКЦИЯ ОТКАЗГАН БЕМОРЛАРДА БРОНКСИАЛЬНАЯ АСТМА КАСАЛЛИГИ КЕЧИШИНИНГ ОЗИГА ХОС ХУСУСИЯТЛАРИ. *ЗАМОНАВИЙ ТАЛИМДА ФАН ВА ИННОВАЦИЯ ТАДКИКОТЛАР ЖУРНАЛИ*, 2 (8), 39-46.
16. АХМАДУЛИНА Г.М. АНЕМИЧЕСКАЯ КАРДИОПАТИЯ ОСЛОЖНЕННАЯ ДИАСТОЛИЧЕСКОЙ ДИС-ФУНКЦИЕЙ ЛЕВОГО ЖЕЛУДОЧКА У ПАЦИЕНТОВ С ХРОНИЧЕСКОЙ ЖЕЛЕЗОДЕФИЦИТНОЙ АНЕМИЕЙ СРЕДИ ПОПУЛЯЦИИ УЧАСТКОВ СЕМЕЙНОЙ ПОЛИКЛИНИКИ №3 Г. ФЕРГАНЫ РЕСПУБЛИКИ УЗБЕКИСТАН. "ЭКОНОМИКА И СОЦИУМ" №2(129) 2025 С. 762-766
17. АХМАДУЛИНА Г.М. КЛИНИЧЕСКИЕ АСПЕКТЫ ИСПОЛЬЗОВАНИЯ L – АРГИНИНА В КОМПЛЕКСНОЙ ТЕРАПИИ БОЛЬНЫХ ИБС В УСЛОВИЯХ СЕМЕЙНОЙ ПОЛИКЛИНИКИ //ЭКОНОМИКА И СОЦИУМ – 2025 - № 11 (138)- 1 С. 750 -755
18. БОБОЖОНОВ, С. С. (2023). ГИПЕРТЕНЗИЯ У ПОЖИЛЫХ. *PEDAGOG RESPUBLIKA ILMU JURNALI*, 6(12), 429-439.
19. БОБОЖОНОВ С. С. ХАРАКТЕРИСТИКА КОМОРБИДНОСТИ КАРДИОЛОГИЧЕСКИХ БОЛЬНЫХ В УСЛОВИЯХ МНОГОПРОФИЛЬНОГО СТАЦИОНАРА //ЭКОНОМИКА И СОЦИУМ. – 2021. – №. 1-1 (80). – С. 456-459.
20. БОБОЖОНОВ С. С., ПУЛАТОВА М. ЭФФЕКТИВНОСТЬ ПРИМЕНЕНИЯ ЛЕКАРСТВЕННЫХ РАСТЕНИЙ В ПРОФИЛАКТИКЕ И ЛЕЧЕНИИ ХОБЛ //FARS INTERNATIONAL JOURNAL OF EDUCATION, SOCIAL SCIENCE & HUMANITIES. – 2025. – Т. 13. – №. 6. – С. 515-517.
21. БОБОЖОНОВ С. С. ВЛИЯНИЕ БОЛЕЗНЕЙ СЕРДЦА НА ЗДОРОВЬЕ ПОЛОСТИ РТА //ЭКОНОМИКА И СОЦИУМ. – 2025. – №. 6-2 (133). – С. 1990-2000.
22. БОБОДЖОНОВ С.С. ОГ'ИЗ БОШЛИГИ ГИГИЕНАСИ В.А. ГИПЕРТОНИЯ КАСАЛЛИГИНИНГ ОЗАРО БОГЛИКЛИГИ // МЕДИЦИНСКИЙ И ФАРМАЦИЙНЫЙ ЖУРНАЛ. – 2024. – Т. 7. – №. 6. – С. 113-114.
23. БОБОЖОНОВ С. С. КОМОРБИДНАЯ ПАТОЛОГИЯ В КАРДИОЛОГИЧЕСКОЙ ПРАКТИКЕ //RE-HEALTH JOURNAL. – 2020. – №. 4 (8). – С. 15-18.
24. ШАМСУТДИНОВА, Г. Б. (2025). ОСОБЕННОСТИ РАЗВИТИЯ И ТЕЧЕНИЯ КАРДИТА У ДЕТЕЙ ПРИ РЕВМАТИЧЕСКОЙ ЛИХОРАДКЕ. *ЭКОНОМИКА И СОЦИУМ*, (10-1 (137)), 995-998.
25. ШАМСУТДИНОВА, Г. Б. (2024). ПЕРСПЕКТИВЫ СВОЕВРЕМЕННОЙ КОМПЛЕКСНОЙ ТЕРАПИИ ПРИ РЕВМАТОИДНОМ АРТРИТЕ У ДЕТЕЙ. *ЭКОНОМИКА И СОЦИУМ*, (6-2 (121)), 1486-1493.
26. ШАМСУТДИНОВА, Г. Б. (2023). НЕКОТОРЫЕ РЕКОМЕНДАЦИИ ПРИ ХРОНИЧЕСКОЙ СЕРДЕЧНОЙ НЕДОСТАТОЧНОСТИ. *ЭКОНОМИКА И СОЦИУМ*, (3-2 (106)), 747-750.
27. ШАМСУТДИНОВА, Г. Б., ХАФИЗОВА, З. Б., ХУСАНОВА, Х. А., & АБДУЛЛАЕВА, Д. А. (2022). ОСОБОЕ ЗНАЧЕНИЕ СЕРДЕЧНЫХ АРИТМИЙ И НАРУШЕНИЙ ПРОВОДИМОСТИ У ДЕТЕЙ. *ЭКОНОМИКА И СОЦИУМ*, (1-2 (92)), 388-392.
28. ШАМСУТДИНОВА, Г. Б., & ГАДАЕВ, А. Г. (2023). *РОЛЬ ЦИСТАТИНА-С В ДИАГНОСТИКИ ДИСФУНКЦИИ ПОЧЕК У ПАЦИЕНТОВ С ХРОНИЧЕСКОЙ СЕРДЕЧНОЙ НЕДОСТАТОЧНОСТЬЮ* (DOCTORAL DISSERTATION).
29. ШАМСУТДИНОВА, Г. Б. (2019). РАЗРАБОТКА ПЕРСПЕКТИВНЫХ НАПРАВЛЕНИЙ ЭКОНОМИКИ ОТДЕЛЬНЫХ РЕГИОНОВ КАК СТРУКТУРНЫХ ЭЛЕМЕНТОВ НАЦИОНАЛЬНОЙ ЭКОНОМИКИ. М 34 МАТЕРИАЛЫ

МЕЖДУНАРОДНОГО НАУЧНОГО ФОРУМА ОБУЧАЮЩИХСЯ «МОЛОДЕЖЬ В НАУКЕ И ТВОРЧЕСТВЕ»(3 АПРЕЛЯ 2019 Г.)[ЭЛЕКТРОННЫЙ, 430.

30. ГАДАЕВА, Н. А., ГАДАЕВ, А. Г., & ШАМСУТДИНОВА, Г. Б. (2024). СУРУНКАЛИ ЮРАК ЕТИШМОВЧИЛИГИ МАВЖУД БЕМОРЛАРДА СТАНДАРТ ДАВО МУОЛАЖАЛАРИНИНГ ЮРАК ФУНКЦИОНАЛ ҲОЛАТИ ВА ҲАЁТ СИФАТИГА ТАЪСИРИ.

31. ШАМСУТДИНОВА, Г. Б., & ИРГАШЕВА, А. (2024). ПАТОЛОГИЧЕСКИЕ ИЗМЕНЕНИЯ ПЛАЦЕНТЫ ПРИ ХРОНИЧЕСКОЙ ВНУТРИМАТОЧНОЙ ИНФЕКЦИИ ФАКТОР РЕАЛИЗАЦИИ РИСКОВ ПЕРИНАТАЛЬНОЙ ПАТОЛОГИИ». *INNOVATIVE DEVELOPMENTS AND RESEARCH IN EDUCATION*, 3(29), 437-442.

32. АБДУЛЛАЕВА, Д. А., ШАМСУТДИНОВА, Г. Б., ХАФИЗОВА, З. Б., & ХУСАНОВА, Х. А. (2022). ОСОБЕННОСТИ ЛЕЧЕНИЯ ДЕТЕЙ С РЕВМАТИЧЕСКИМИ ПОРОКАМИ СЕРДЦА. *ЭКОНОМИКА И СОЦИУМ*, (1-1 (92)), 283-286.

33. ЕФИМЕНКО, О. В., КНЯЖЕВА, Е. Д., & ШАМСУТДИНОВА, Г. Б. (2017). КЛИНИЧЕСКАЯ ХАРАКТЕРИСТИКА ДЕТЕЙ С ВРОЖДЕННЫМИ СЕПТАЛЬНЫМИ ПОРОКАМИ СЕРДЦА. *NOVAINFO. RU*, 1(62), 346-349.

34. ЕФИМЕНКО, О. В., КНЯЖЕВА, Е. Д., & ШАМСУТДИНОВА, Г. Б. (2017). КЛИНИКО-ИНСТРУМЕНТАЛЬНАЯ ХАРАКТЕРИСТИКА ДЕТЕЙ С ОТКРЫТЫМ ОВАЛЬНЫМ ОКНОМ. *NOVAINFO. RU*, 1(62), 349-351.

35. ALIJON O'G'LI, M. A., & BAKHTIYOROVNA, J. R. G. (2026). BEMORLARDA ANEMIYA DARAJASIGA QARAB MIOKARD INFARKTINING OG 'IRLIK DARAJASI VA KLINIK NATIJALARINI BAHOLASH. *PEDAGOGICAL SCIENCES AND TEACHING METHODS*, 5(53), 185-189.

36. JURABOEVA, G. B. (2025). STUDY OF THE RELATIONSHIP BETWEEN KIDNEY DAMAGE IN RHEUMATOID ARTHRITIS AND THE CLINICAL COURSE OF THE DISEASE. *CENTRAL ASIAN JOURNAL OF MEDICINE*, (9), 176-181.

37. BAKHTIYAROVNA, J. G., & SUNNATOVNA, A. G. (2025). OSTEOARTHRITIS: IMPACT ON FUNCTIONAL CAPABILITIES AND REHABILITATION STRATEGIES. *WEB OF MEDICINE: JOURNAL OF MEDICINE, PRACTICE AND NURSING*, 3(5), 629-633.

38. AGZAMOVA, G. S., & JO'RABOYEVA, G. B. (2024). REVMATOID ARTRITDA BUYRAK ZARLANISHINING O 'ZIGA XOS XUSUSIYATLARI.

39. QIZI, J. G. B. (2021). CHANGES IN THE FUNCTIONAL STATUS OF THE KIDNEYS IN PATIENTS WITH RHEUMATOID ARTHRITIS. *THE AMERICAN JOURNAL OF MEDICAL SCIENCES AND PHARMACEUTICAL RESEARCH*, 3(08), 21-25.

40. ЖЎРАБОЕВА, Г. Б. (2021). РАННЯЯ ДИАГНОСТИКА ПАТОЛОГИИ ПОЧЕК ПРИ РЕВМАТОИДНОМ АРТРИТЕ. *UNIVERSUM: МЕДИЦИНА И ФАРМАКОЛОГИЯ*, (9 (80)), 4-6.

41. ERGASHEVICH, M. R. (2025). PREVENTION AND TREATMENT METHODS OF BRONCHIAL ASTHMA. *INTRODUCTION OF NEW INNOVATIVE TECHNOLOGIES IN EDUCATION OF PEDAGOGY AND PSYCHOLOGY*, 2(5), 154-156.

42. MAMADJANOV, R. (2026, MARCH). PHENOTYPES OF BRONCHIAL ASTHMA AND MODERN CHOICE OF THERAPY. IN *INTERNATIONAL CONFERENCE ON SCIENCE, INNOVATION AND GLOBAL DEVELOPMENT* (VOL. 1, NO. 3, PP. 69-84).