Available online **www.ijpras.com**

International Journal of Pharmaceutical Research & Allied Sciences, 2023, 12(2):54-57
https://doi.org/10.51847/wXAjWjcJY7

Original Article

ISSN : 2277-3657
CODEN(USA) : IJPRPM

Cardiovascular Safety in the Treatment of Chronic Rheumatic Pathologies

Tamerlan Tulegenovich Zakaev[1*], Medina Vakhaevna Bakrieva[1], Rabiyat Tazhutdinovna Alkhazova[2], Diana Borisovna Girkina[3], Anzhela Yunusovna Chagarova[3], Angelina Andreevna Polyanskaya[3]

[1]Department of Therapy, Medical Faculty of the Medical Institute of the Chechen State University, Grozny, Republic of Chechnya, Russia.
[2]Department of Pharmacology, Faculty of Medicine of Dagestan State University, Makhachkala, Republic of Dagestan, Russia.
[3]Department of Therapy, Faculty of Medicine, Stavropol State Medical University, Stavropol, Russia.

***Email:** ruslankalmykov777@yandex.ru*

ABSTRACT

According to statistics from the World Health Organization (WHO), from 9 to 45% of people are susceptible to diseases of the musculoskeletal system. In addition, about 3% of people can be classified as disabled due to their condition of bones and joints, and almost every one of this 3% will experience severe pain. To eliminate pain, doctors prescribe nonsteroidal anti-inflammatory drugs (NSAIDs) to these people. Within the framework of this article, the possibility of using NSAIDs in chronic inflammatory rheumatic pathologies was considered, and their effect on the human body was also considered. In a study of patients with severe psoriatic arthritis, it was found that prevention with methotrexate led to the least number of cases of cardiovascular diseases in comparison with other methods of prevention, including traditional treatment, phototherapy, and climatotherapy. It has also been suggested that the effect of inhibitors is a defense against tumor necrosis. The method of prevention of patients with severe forms of psoriatic arthritis can greatly affect the reduction in the number of cardiovascular diseases, as a result, local studies are needed to more accurately assess the cardiovascular safety and effectiveness of systemic therapy.

Key words: *Selective inhibitors, NSAIDs, Arthritis, Psoriatic arthritis, Cardiovascular diseases*

INTRODUCTION

Inflammatory arthritis is a common chronic inflammatory disease that often leads to cardiovascular disease [1-3]. Inflammatory arthritis is a key problem in the pathogenesis of atherosclerosis, however, special anti-inflammatory therapy can become a key link in the treatment of atherothrombotic diseases [4]. However, the impact of systematized anti-inflammatory prevention of cardiovascular diseases in people with chronic inflammatory diseases, including rheumatoid arthritis and psoriatic arthritis, is of great interest [5].

Nonsteroidal anti-inflammatory drugs (NSAIDs) are indispensable in the treatment of pain due to the integrated role of the cyclooxygenase pathway (COX) in inflammation and pain recognition [6]. However, the disadvantage of NSAIDs is their toxicity [7]. In the 1990s, paracetamol was used as a pain reliever for osteoarthritis, but further studies have shown that paracetamol adversely affects the organs of the gastrointestinal tract (GIT). In addition, paracetamol has fewer analgesic properties than NSAIDs and cannot be a worthy alternative to NSAIDs in any inflammatory arthritis [8].

Determination of cyclooxygenase 2 (COX-2) and further use of COX-2 selective NSAID preparations was a discovery that was expected to significantly reduce side effects when administered intravenously. However, this does not apply to celecoxib, and, as it later turned out, to all COX-2-selective inhibitors when used together with ASA [9]. Selective COX-2 inhibitors inhibit renal COX-2 resulting in urinary tract fluid retention, edema, hypertension, and cardiac congestion which can be fatal [10].

The main disadvantage of selective COX-2 inhibitors has been an increase in the incidence of myocardial infarction and other cardiovascular diseases [11, 12]. Thus, the initially expected undeniable advantages of selective COX-2 inhibitors were outweighed by their possible toxicity. An analysis of the literature showed that it is possible to use a proton pump inhibitor drug with traditional NSAIDs [13]. It has also been mentioned in the literature that NSAIDs and selective COX-2 inhibitors significantly reduce gastrointestinal and peptic ulcer toxicity [14-16]. Thus, traditional NSAIDs can be considered the most preferable in the prevention of arthritis and diseases of the musculoskeletal system.

However, during the analysis of the literature data, we came across conflicting results and selective data from random studies or clinical cohorts of patients with psoriatic arthritis [17-20]. Thus, our work aimed to study the incidence of cardiovascular diseases in patients with severe psoriatic arthritis. These patients were treated with systemic therapy, i.e., biological agents (including tumor necrosis factor inhibitors and an interleukin-12/23 inhibitor), methotrexate, cyclosporine, retinoids, and other prevention methods, including traditional medicine, phototherapy, and real-life climatotherapy [21].

MATERIALS AND METHODS

Among the patients of the Dagestan diagnostic centers, a cohort study was conducted, which involved 464 patients aged 18 to 65 years. Of these, there were 252 women and 212 men. All patients were in the hospital or on home treatment with the main diagnosis of psoriatic arthritis. The study was conducted from 2014 to 2017. Patients with severe and moderate psoriatic arthritis were divided into five groups with different methods of treatment: group 1 - cyclosporine; group 2 - methotrexate; group 3 - biological products; group 4 - retinoids; and group 5 - various therapies based on traditional medicine (topical NSAIDs and/or topical vitamin D analogs), phototherapy (UVB and psoralen plus UVA), and climatotherapy. Patients were under medical supervision all the time from the moment of illness until December 31, 2017. or their recovery. Patients were regularly monitored with questionnaires and timely collection of data on their health status.

RESULTS AND DISCUSSION

This study involved 464 people, and no deaths were detected during the study. Most patients received NSAIDs that reduce the concentration of glucose, cholesterol, and antihypertensive drugs. The use of antidepressants was carried out only with severe pain syndrome. It should be noted that the development of cardiovascular diseases during treatment remained unlikely.

The number of patients in the 1st group was 82 people, in the 2nd group - 170, in the 3rd group - 16, in the 4th group - 53, and the number of people who turned to traditional medicine (5th group), amounted to 143 people. The number of cardiovascular complications was: for group 1 - 1 person; for group 2 - 3 people; for group 3 - 1 person; for a group of 4 - 4 people; for a group of 5 - 12 people **(Figure 1)**.

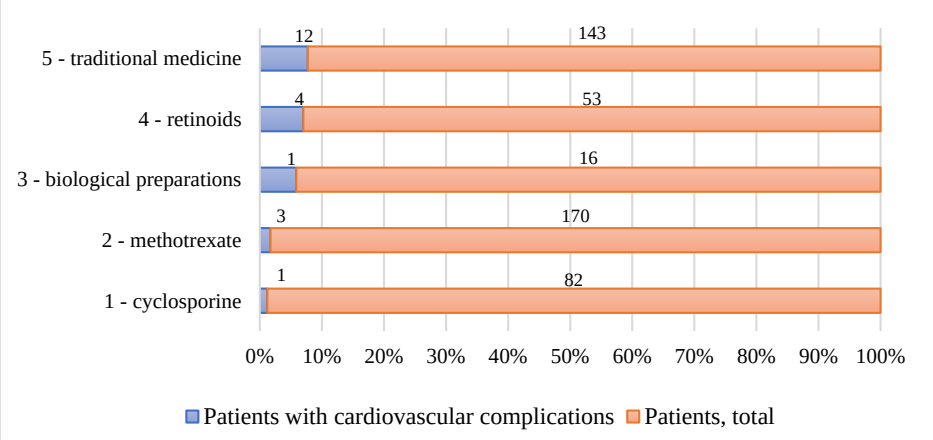

Figure 1. The number of complications in the cardiovascular system for each group of patients

It is worth noting that there were 37 patients with gastrointestinal problems out of 7027 observed people. These results allowed us to conclude that the combination of treatment with NSAIDs and selective inhibitors has become the safest method for the prevention and treatment of chronic inflammatory rheumatic pathologies.

CONCLUSION

The detection of cyclooxygenase 2 (COX-2) and the further administration of selective COX-2 inhibitors, non-steroidal anti-inflammatory drugs (NSAIDs), has become a key factor in the prevention of diseases of the musculoskeletal system, but side effects on the gastrointestinal tract (GIT) should be taken into account. We did not find any evidence that celecoxib causes fewer gastrointestinal side effects than classic NSAIDs, and improvement in symptoms for COX-2 selective inhibitors is not a panacea. We also found no evidence that selective COX-2 inhibitors are more effective in preventing inflammatory arthritis than classical NSAIDs. Based on these data, we concluded that COX-2 selective inhibitors are no better than classical NSAIDs. It is also important to note that most older people require aspirin, which reacts with COX-2 to form COX-1, making it a classic NSAID. Data obtained from a literature review suggest that the combined use of NSAIDs and COX-2 significantly reduces the possibility of recurrence and ulceration, as well as reduces pain from symptoms. Thus, classic NSAIDs continue to be a good choice for the prevention of inflammatory arthritis and musculoskeletal disorders, especially when given together with a proton pump inhibitor.

ACKNOWLEDGMENTS : None

CONFLICT OF INTEREST : None

FINANCIAL SUPPORT : None

ETHICS STATEMENT : All patients sighned agreement before the start of the experiment. All additional information is available upon request from the corresponding author.

REFERENCES

1. Taheri F, Masoudi S, Soltani Z. Diagnosis of Cardiovascular Disease Using Fuzzy Methods in Nuclear Medicine Imaging. Arch Pharm Pract. 2019;10(4):118-26.
2. Alzahrani S, Alosaimi ME, Oways FF, Hamdan AO, Suqati AT, Alhazmi FS, et al. Knowledge of Cardiovascular Diseases and Their Risk Factors among the Public in Saudi Arabia. Arch Pharm Pract. 2019;10(3):47-51.
3. Gholizadeh B, Nabavi SS, Baghaei S, Zadeh FJ, Moradi-joo E, Amraie R, et al. Evaluation of Risk Factors for Cardiovascular Diseases in Pregnant Women Referred to Golestan Hospital in Ahvaz. Entomol Appl Sci Lett. 2021;8(3):40-5.
4. Jourdi G, Marquis-Gravel G, Martin AC, Lordkipanidzé M, Godier A, Gaussem P. Antiplatelet Therapy in Atherothrombotic Diseases: Similarities and Differences Across Guidelines. Front Pharmacol. 2022;13:878416. doi:10.3389/fphar.2022.878416
5. England BR, Thiele GM, Anderson DR, Mikuls TR. Increased cardiovascular risk in rheumatoid arthritis: mechanisms and implications. BMJ. 2018;361:k1036. doi:10.1136/bmj.k1036
6. Schjerning AM, McGettigan P, Gislason G. Cardiovascular effects and safety of (non-aspirin) NSAIDs. Nat Rev Cardiol. 2020;17(9):574-84. doi:10.1038/s41569-020-0366-z
7. Hijos-Mallada G, Sostres C, Gomollón F. NSAIDs, gastrointestinal toxicity and inflammatory bowel disease. Gastroenterol Hepatol. 2022;45(3):215-22. English, Spanish. doi:10.1016/j.gastrohep.2021.06.003
8. Wienecke T, Gøtzsche PC. Paracetamol versus nonsteroidal anti-inflammatory drugs for rheumatoid arthritis. Cochrane Database Syst Rev. 2004;2004(1):CD003789. doi:10.1002/14651858.CD003789.pub2
9. Cui J, Jia J. Natural COX-2 Inhibitors as Promising Anti-inflammatory Agents: An Update. Curr Med Chem. 2021;28(18):3622-46. doi:10.2174/0929867327999200917150939
10. Brater DC, Harris C, Redfern JS, Gertz BJ. Renal effects of COX-2-selective inhibitors. Am J Nephrol. 2001;21(1):1-15. doi:10.1159/000046212
11. Chen W, Zhong Y, Feng N, Guo Z, Wang S, Xing D. New horizons in the roles and associations of COX-2 and novel natural inhibitors in cardiovascular diseases. Mol Med. 2021;27(1):123. doi:10.1186/s10020-021-00358-4

12. Mukherjee D, Nissen SE, Topol EJ. Risk of cardiovascular events associated with selective COX-2 inhibitors. JAMA. 2001;286(8):954-9. doi:10.1001/jama.286.8.954
13. Latimer N, Lord J, Grant RL, O'Mahony R, Dickson J, Conaghan PG; National Institute for Health and Clinical Excellence Osteoarthritis Guideline Development Group. Cost-effectiveness of COX 2 selective inhibitors and traditional NSAIDs alone or in combination with a proton pump inhibitor for people with osteoarthritis. BMJ. 2009;339:b2538. doi:10.1136/bmj.b2538
14. Ballinger A, Smith G. COX-2 inhibitors vs. NSAIDs in gastrointestinal damage and prevention. Expert Opin Pharmacother. 2001;2(1):31-40. doi:10.1517/14656566.2.1.31
15. Rzhepakovsky I, Anusha Siddiqui S, Avanesyan S, Benlidayi M, Dhingra K, Dolgalev A, et al. Anti-arthritic effect of chicken embryo tissue hydrolyzate against adjuvant arthritis in rats (X-ray microtomographic and histopathological analysis). Food Sci Nutr. 2021;9(10):5648-69. doi:10.1002/fsn3.2529
16. Wang H, Yang D, Li L, Yang S, Du G, Lu Y. Anti-inflammatory Effects and Mechanisms of Rhein, an Anthraquinone Compound, and Its Applications in Treating Arthritis: A Review. Nat Prod Bioprospect. 2020;10(6):445-52. doi:10.1007/s13659-020-00272-y
17. Crofford LJ. Use of NSAIDs in treating patients with arthritis. Arthritis Res Ther. 2013;15 Suppl 3(Suppl 3):S2. doi:10.1186/ar4174
18. Scher JU, Ogdie A, Merola JF, Ritchlin C. Preventing psoriatic arthritis: focusing on patients with psoriasis at increased risk of transition. Nat Rev Rheumatol. 2019;15(3):153-66. doi:10.1038/s41584-019-0175-0
19. Schendrigin IN, Timchenko LD, Rzhepakovsky IV, Avanesyan SS, Sizonenko MN, Grimm WD, et al. Clinical and pathogenetic significance of amylase level and microtomographic index of synovial fluid in various joint lesions. Sovrem Tehnol V Med. 2022;14(6):42. doi:10.17691/stm2022.14.6.05
20. Kerschbaumer A, Smolen JS, Aletaha D. Disease activity assessment in patients with psoriatic arthritis. Best Pract Res Clin Rheumatol. 2018;32(3):401-14. doi:10.1016/j.berh.2018.08.004
21. Menter A. Psoriasis and psoriatic arthritis overview. Am J Manag Care. 2016;22(8 Suppl):s216-24.