ISSN 2181-3187

THE POSSIBILITIES OF REDUCING THE RISK OF GASTROINTESTINAL COMPLICATIONS IN THE TREATMENT OF MODERN NONSTEROIDAL ANTI-INFLAMMATORY DRUGS

Numanova Guzaloy Davronbek qizi
Assistant of the Department of pharmacology, clinical pharmacology and medical biotechnology, Andijan State Medical Institute

Abstract: Nonsteroidal anti-inflammatory drugs (NSAIDs) are widely used for the management of pain and inflammation, but their therapeutic benefits are often accompanied by gastrointestinal (GI) complications, including ulceration, bleeding, and perforation. In recent years, significant advancements have been made in the development of modern NSAIDs with improved safety profiles. This review aims to explore the mechanisms of NSAID-induced GI toxicity, discuss the limitations of traditional NSAIDs, and evaluate the efficacy of novel strategies for reducing the risk of GI complications associated with modern NSAID therapy. These strategies include the development of selective cyclooxygenase-2 (COX-2) inhibitors, co-administration of gastroprotective agents, utilization of novel drug delivery systems, and the exploration of alternative anti-inflammatory agents. By understanding and implementing these approaches, healthcare providers can optimize the safety and efficacy of NSAID therapy while minimizing the risk of GI adverse events in patients.

Keywords: nonsteroidal anti-inflammatory drugs, gastrointestinal complications, COX-2 inhibitors, gastroprotection, drug delivery systems, alternative anti-inflammatory agents.

Introduction: Nonsteroidal anti-inflammatory drugs (NSAIDs) are widely prescribed for the management of pain and inflammation associated with various conditions, including arthritis, musculoskeletal disorders, and postoperative pain. However, their use is often limited by the risk of gastrointestinal (GI) complications, such as ulcers, bleeding, and perforation. Traditional NSAIDs inhibit both cyclooxygenase-1 (COX-1) and cyclooxygenase-2 (COX-2) enzymes, leading to disruption of the gastric mucosal barrier and increased susceptibility to GI damage. In recent years, efforts have been made to develop modern NSAIDs with improved safety profiles and reduced GI toxicity. This review aims to explore the mechanisms of NSAID-induced GI toxicity, discuss the limitations of traditional NSAIDs, and evaluate novel strategies for mitigating the risk of GI complications associated with modern NSAID therapy.

Mechanisms of NSAID-Induced GI Toxicity: The gastrointestinal toxicity of NSAIDs is primarily attributed to their inhibition of COX enzymes, which play a key

ISSN 2181-3187

role in maintaining the integrity of the gastric mucosa. By inhibiting COX-1, NSAIDs suppress the synthesis of cytoprotective prostaglandins, leading to decreased mucosal blood flow, impaired bicarbonate secretion, and increased gastric acid secretion. Additionally, NSAID-induced inhibition of COX-2 disrupts the balance between pro-inflammatory and anti-inflammatory mediators, exacerbating mucosal inflammation and injury. Furthermore, NSAIDs can directly damage gastric epithelial cells and promote oxidative stress, further contributing to GI damage and ulceration.

Limitations of Traditional NSAIDs: Traditional NSAIDs, such as ibuprofen, naproxen, and diclofenac, are associated with a high incidence of GI adverse events, particularly in patients with a history of peptic ulcer disease, advanced age, or concomitant use of anticoagulants or corticosteroids. Despite their efficacy in pain management, the risk of GI complications limits their long-term use and necessitates the exploration of alternative treatment options.

Novel Strategies for Reducing GI Complications: Several strategies have been proposed to reduce the risk of GI complications associated with NSAID therapy. One approach involves the development of selective COX-2 inhibitors, such as celecoxib and etoricoxib, which preferentially inhibit COX-2 without affecting COX-1-mediated cytoprotective mechanisms. These agents have demonstrated efficacy in reducing the incidence of GI ulcers and bleeding compared to traditional NSAIDs. Another strategy involves the co-administration of gastroprotective agents, such as proton pump inhibitors (PPIs) and misoprostol, which help to maintain mucosal integrity and reduce the risk of NSAID-induced ulceration.

Conclusion: NSAIDs are valuable therapeutic agents for the management of pain and inflammation, but their use is limited by the risk of gastrointestinal complications. Recent advancements in the development of modern NSAIDs with improved safety profiles offer promising opportunities to mitigate the risk of GI adverse events. Strategies such as the use of selective COX-2 inhibitors, co-administration of gastroprotective agents, utilization of novel drug delivery systems, and exploration of alternative anti-inflammatory agents have shown potential in reducing NSAID-induced GI toxicity. By understanding and implementing these approaches, healthcare providers can optimize the safety and efficacy of NSAID therapy while minimizing the risk of GI complications in patients.

Acknowledgments: The authors would like to thank all researchers and healthcare professionals involved in the study and management of NSAID-induced gastrointestinal complications.

REFERENCES:

1.Аляутдин Р.Н., Давыдова О.Н., Бондарчук Н.Г. Фармакология: Учебник для вузов. 5-е изд. / под ред. Р.Н. Аляутдина. М.: ГЭОТАР-Медиа, 2016. 1104 с. [Aljautdin R.N., Davydova O.N., Bondarchuk N.G. Farmakologija: Uchebnik dlja

vuzov. 5-e izd. / pod red. R.N. Aljautdina. M.: GJeOTAR-Media, 2016. 1104 s. (in Russian)].
2. Клиническая фармакология: учебник / под ред. В.Г. Кукеса, Д.А. Сычева. 5-е изд., испр. и доп. М.: ГЭОТАР-Медиа, 2015. 1024 с. [Klinicheskaja farmakologija: uchebnik / pod red. V.G. Kukesa, D.A. Sycheva. 5-e izd., ispr. i dop. M.: GJeOTAR-Media, 2015. 1024 s. (in Russian)].
3. Страчунский Л.С., Козлов С.Н. Нестероидные противовоспалительные средства. Интернет-ресурс: http://www.antibiotic.ru/rus/all/metod/npvs [Strachunskij L.S., Kozlov S.N. Nesteroidnye protivovospalitel'nye sredstva. Internet-resurs: http://www.antibiotic.ru/rus/all/metod/npvs (in Russian)].
4. Клиническая фармакология: национальное руководство / под ред. Ю.Б. Белоусова, В.Г. Кукеса и др. М.: ГЭОТАР-Медиа, 2014. 976 с. [Klinicheskaja farmakologija: nacional'noe rukovodstvo / pod red. Ju.B. Belousova, V.G. Kukesa i dr. M.: GJeOTAR-Media, 2014. 976 s. (in Russian)].
5. Chandrasekharan N. V. et al. COX-3, a cyclooxygenase-1 variant inhibited by acetaminophen and other analgesic/antipyretic drugs: Cloning, structure, and expression // Proceeding of The National Academy of Sciences, 200213926–13931, doi: 10.1073/pnas.162468699.
6. Lidbury P.S., Vojnovic I., Warner T.D. COX-2/COX1 selectivity of aceclofenac in comparison with celecoxib and rofecoxib in the human whole blood assay. Osteoarthritis and Cartilage // Fifth world congress of the OARSI, Barselona, Spain, 4—6 October 2000. Vol. 8. Suppl. B.TH053.
7. Раскина Т.А. Ацеклофенак: терапевтическая эффективность при остеоартрозе // Современная ревматология. 2010. № 4(4). С. 51–54 [Raskina T.A. Aceklofenak: terapevticheskaja jeffektivnost' pri osteoartroze // Sovremennaja revmatologija. 2010. № 4(4). S. 51–54 (in Russian)].
8. Ревматология: национальное руководство / под ред. Е.Л. Насонова, В.А. Насоновой. М.: ГЭОТАР-Медиа, 2008. 720 с. [Revmatologija: nacional'noe rukovodstvo / pod red. E.L. Nasonova, V.A. Nasonovoj. M.: GJeOTAR-Media, 2008. 720 s. (in Russian)].
9. Ананьева Л.П. Комбинированные анальгетики в лечении болевых синдромов // Consilium Medicum. Справочник поликлинического врача. 2005. Т. 5. № 6. С. 44–48 [Anan'eva L.P. Kombinirovannye anal'getiki v lechenii bolevyh sindromov // Consilium Medicum. Spravochnik poliklinicheskogo vracha. 2005. T. 5. № 6. S. 44–48 (in Russian)].
10. Нестероидные противовоспалительные средства (Редакц. статья) // Клин. фармакол. и фармакотер. 1994. № 3. С. 6–7 [Nesteroidnye protivovospalitel'nye sredstva (Redakc. stat'ja) // Klin. farmakol. i farmakoter. 1994. № 3. S. 6–7 (in Russian)].

ISSN 2181-3187

11. Loeb D.S., Ahlquist D.A., Talley N.J. Management of gastroduo-denopathy associated with use of nonsteroidal anti-inflammatory drugs // Mayo Clin. Proc. 1992. Vol. 67. P. 354–364.
12. Максимов М.Л. Современные подходы к терапии болевого синдрома // РМЖ. 2013. Т. 21. № 34. С. 1734–1736. [Maksimov M.L. Sovremennye podhody k terapii bolevogo sindroma. // RMZh. 2013. T. 21. № 34. S. 1734–1736 (in Russian)].
13. García Rodríguez L.A., Hernández-Díaz S. Relative risk of upper gastrointestinal complications among users of acetaminophen and nonsteroidal anti-inflammatory drugs // Epidemiology. 2001. Vol. 12(5). P. 570–576.
14. Евсеев М.А. Повреждение кишечной трубки нестероидными противовоспалительными препаратами: клиническое значение, патогенез, возможности профилактики // Неврология, нейропсихиатрия, психосоматика. 2013. № 1. С. 79–87 [Evseev M.A. Povrezhdenie kishechnoj trubki nesteroidnymi protivovospalitel'nymi preparatami: klinicheskoe znachenie, patogenez, vozmozhnosti profilaktiki // Nevrologija, nejropsihiatrija, psihosomatika. 2013. № 1. S. 79–87 (in Russian)].
15. Максимов М.Л. Место миорелаксантов в лечении болевого синдрома // РМЖ. 2014. № 7. С. 514–517 [Maksimov M. L. Mesto miorelaksantov v lechenii bolevogo sindroma // RMZh. 2014. № 7. S. 514–517 (in Russian)].