

32.b

Nonsteroidal Anti-İnflamatuar İlaçlar ve Asetaminofen

İsmihan SUNAR¹
Esra Kapsız ÖZCAN²

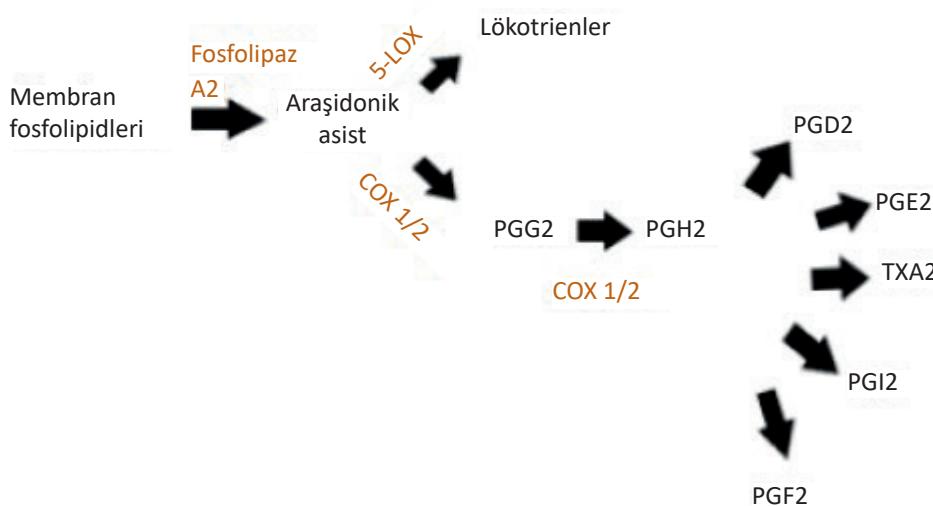
Giriş

Nonsteroidal anti-inflamatuar ilaçlar (NSAİİ) romatizmal hastalıklar dahil pek çok ağrılı ve inflamatuar durumun tedavisinde semptomatik yarar sağlayan, kimyasal yapı bakımından heterojen bir gruptur. Analjezik, antipyretik ve anti-inflamatuar etkinlik yanında istenmeyen bazı yan etkilere de sahip olan NSAİİ'ler tüm Dünya'da en yaygın reçetelenen ilaçlardandır (1). Milattan önce 500. yılında Hipokrat daha sonra aspirinin izole edildiği söğüt kabuğunun ateş düşürme ve ağrı kesmeye potansiyelini yazmıştır (2). Ağrı tedavisindeki uzun yıllardır bilinen rolü yanı sıra son yıllarda kansere karşı koruyucu etkinliği ve nörodejene-

ratif hastalıklar açısından yararlı etkileri bildirilmiştir (3).

Etki mekanizması

En iyi bilinen etki mekanizması; siklooksijenaz (cyclooxygenase; COX) enzim inhibisyonu ile prostaglandin E₂ (PGE₂), prostaglandin I₂ (PGI₂), Tromboksan A₂ (TXA₂) gibi prostanoidlerin sentezini bloke ederek bu mediatörler aracılığı ile oluşan hücresel pro-inflamatuar etkileri engellemesidir (Şekil 1). Bu pro-inflamatuar etkilerden bazıları; eritem, artmış kan akımı, hiperaljezi ve bradikinin ve benzeri bir takım mediatörlerin salınımıdır (1).



Şekil 1. COX enzimleri ve prostaglandinlerin sentezi

COX: siklooksijenaz, 5-LOX: 5-lipo oksijenaz, PG: Prostaglandin, TXA₂: Tromboksan A2, PGI2: Prostasiklin

¹ Uzm. Dr., Ankara Üniversitesi Tıp Fakültesi Fiziksel Tıp ve Rehabilitasyon Bilim Dalı, Romatoloji Bölümü
dr.ismihan@gmail.com

² Uzm. Dr., Sakarya Araştırma Hastanesi Fiziksel Tıp ve Rehabilitasyon Kliniği, esraozcan1979@gmail.com

ların sonuçları çok yaygın klinik endikasyonlarla reçetelenen parasetamolün endikasyon ilişkili karıştırıcı faktörlere olan duyarlılığından etkilenmiş olabilir (46). Toplum temelli retrospektif bir çalışmada yaşlı popülasyonda NSAİİ-parasetamol kombinasyonunun gastrointestinal güvenliği araştırılmış ve 644.183 hasta taranmıştır. Eşlik eden proton pompa inhibitör kullanımı yokluğunda gastrointestinal sebepli hastane yatış riski >3 gr/gün parasetamol kullananlarda 1.20 (1.03-1.40) kat, geleneksel NSAİİ'leri kullananlarda 1.63 (1.44-1.85), parasetamol ve NSAİİ kombinasyonu alanlarda ise 2.55 (1.98-3.28) kat artmış olarak bildirilmiştir. Yaşlı hastalarda NSAİİ parasetamol kombinasonunda dikkatli olunmalıdır (47). Parasetamolün COX1 ve COX2'nin zayıf bir inhibitörü olduğu ve nadir de olsa hipotansiyon, transaminaz yüksekliği, trombositopeni, lökopeni, nötropeni, deri döküntüsü, hipersensitivite reaksiyonlarına neden olabildiği akılda tutulmalıdır (6).

Sonuç

NSAİİ'ler tüm Dünya'da en yaygın reçete edilen ilaçlardan olup osteoartrit, inflamatuar artrit, bölgesel ağrılar gibi klinik durumlarda hem inflamasyon hem de ağrı kontrolünde önemlidir. NSAİİ'ler analjezik, antipiretik ve antiinflamatuar etkilerini büyük oranda COX enzim blokajı ile sağlarlar. NSAİİ'lere bağlı yan etkiler göz önüne alındığında asetaminofen halen yerini muhafaza etmektedir. NSAİİ'ler yalnızca endike olduğunda, mümkün olan en düşük doz ve sürede kullanılmalıdır.

KAYNAKLAR

- Patrono C. Nonsteroidal antiinflammatory Drugs. 2019. In: Rheumatology [Internet]. Elsevier. 7th.
- Bindu S, Mazumder S, Bandyopadhyay U. Non-steroidal anti-inflammatory drugs (NSAIDs) and organ damage: A current perspective. *Biochemical pharmacology*. 2020;180:114147.
- Bacchi S, Palumbo P, Sponta A, et al. Clinical pharmacology of non-steroidal anti-inflammatory drugs: a review. *Anti-inflammatory & anti-allergy agents in medicinal chemistry*. 2012;11(1):52-64.
- Zarghi A, Arfaei S. Selective COX-2 Inhibitors: A Review of Their Structure-Activity Relationships. *Iranian journal of pharmaceutical research*. 2011;10(4):655-83.
- Marnett LJ. The COXIB experience: a look in the rearview mirror. *Annual review of pharmacology and toxicology*. 2009;49:265-90.
- Gülnur Taşçı Bozbaş GG. Nonsteroidal Antiinflamatuar İlaçlar, Analjezikler ve Kas Gevşeticiler. In: Romatoloji e-Kitap [Internet]. Türkiye Romatizma Araştırma ve Savaş Derneği.
- Verbeeck RK. Pathophysiologic factors affecting the pharmacokinetics of nonsteroidal antiinflammatory drugs. *The Journal of rheumatology Supplement*. 1988;17:44-57.
- Solomon DH. Nonselective NSAIDs: Overview of adverse effects. In: UPTODATE [Internet].
- Association UCP. The Handbook of Perioperative Medicines UKCPA; NSAIDS AND COX-2 INHIBITORS [Available from: <https://www.ukcpa-periophandbook.co.uk/medicine-onographs/nsaids-and-cox-2-inhibitors>].
- Solomon DH. NSAIDs: Pharmacology and mechanism of action. 2022 [cited 22.06.2022]. In: Uptodate [Internet]. [cited 22.06.2022].
- Crofford LJ. Prostanoid Biology and Its Therapeutic Targeting [Available from: <https://musculoskeletalkey.com/prostanoid-biology-and-its-therapeutic-targeting/>].
- Grosser T SE, Fitzgerald GA. Anti-inflammatory, antipyretic, and analgesic agents; pharmacotherapy of gout. In: Brunton L CB, Knollman B, editor. Goodman and Gilman's The Pharmacological Basis of Therapeutics. 12th ed. New York: McGraw-Hill; 2011. p. 959-1004.
- Bozimowski G. A Review of Nonsteroidal Anti-inflammatory Drugs. *AANA journal*. 2015;83(6):425-33.
- Lanas A, Benito P, Alonso J, et al. Safe Prescription Recommendations for Non Steroidal Anti-inflammatory Drugs: Consensus Document Elaborated by Nominated Experts of Three Scientific Associations (SER-SEC-AEG). *Reumatología Clínica* (English Edition). 2014;10(2):68-84.
- Shin S. Safety of celecoxib versus traditional nonsteroidal anti-inflammatory drugs in older patients with arthritis. *Journal of pain research*. 2018;11:3211-9.
- Silverstein FE, Faich G, Goldstein JL, et al. Gastrointestinal toxicity with celecoxib vs nonsteroidal anti-inflammatory drugs for osteoarthritis and rheumatoid arthritis: the CLASS study: A randomi-

- zed controlled trial. Celecoxib Long-term Arthritis Safety Study. *Jama*. 2000;284(10):1247-55.
17. MacDonald TM, Hawkey CJ, Ford I, et al. Randomized trial of switching from prescribed non-selective non-steroidal anti-inflammatory drugs to prescribed celecoxib: the Standard care vs. Celecoxib Outcome Trial (SCOT). *European heart journal*. 2017;38(23):1843-50.
 18. Grosser T, Ricciotti E, Fitzgerald GA. The Cardiovascular Pharmacology of Nonsteroidal Anti-Inflammatory Drugs. *Trends in pharmacological sciences*. 2017;38(8):733-48.
 19. Nissen SE, Yeomans ND, Solomon DH, et al. Cardiovascular Safety of Celecoxib, Naproxen, or Ibuprofen for Arthritis. *The New England journal of medicine*. 2016;375(26):2519-29.
 20. Becker MC, Wang TH, Wisniewski L, et al. Rationale, design, and governance of Prospective Randomized Evaluation of Celecoxib Integrated Safety versus Ibuprofen Or Naproxen (PRECISION), a cardiovascular end point trial of nonsteroidal antiinflammatory agents in patients with arthritis. *American heart journal*. 2009;157(4):606-12.
 21. Farkouh ME, Kirshner H, Harrington RA, et al. Comparison of lumiracoxib with naproxen and ibuprofen in the Therapeutic Arthritis Research and Gastrointestinal Event Trial (TARGET), cardiovascular outcomes: randomised controlled trial. *Lancet* (London, England). 2004;364(9435):675-84.
 22. Combe B, Swergold G, McLay J, et al. Cardiovascular safety and gastrointestinal tolerability of etoricoxib vs diclofenac in a randomized controlled clinical trial (The MEDAL study). *Rheumatology* (Oxford, England). 2009;48(4):425-32.
 23. Bresalier RS, Sandler RS, Quan H, et al. Cardiovascular Events Associated with Rofecoxib in a Colorectal Adenoma Chemoprevention Trial. *New England Journal of Medicine*. 2005;352(11):1092-102.
 24. Fitzgerald GA. Coxibs and Cardiovascular Disease. *New England Journal of Medicine*. 2004;351(17):1709-11.
 25. Fitzgerald GA. COX-2 and beyond: approaches to prostaglandin inhibition in human disease. *Nature Reviews Drug Discovery*. 2003;2(11):879-90.
 26. Gunter BR, Butler KA, Wallace RL, et al. Non-steroidal anti-inflammatory drug-induced cardiovascular adverse events: a meta-analysis. *Journal of Clinical Pharmacy and Therapeutics*. 2017;42(1):27-38.
 27. Davies NM, Jamali F. COX-2 selective inhibitors cardiac toxicity: getting to the heart of the matter. *Journal of pharmacy & pharmaceutical sciences : a publication of the Canadian Society for Pharmaceutical Sciences, Societe canadienne des sciences pharmaceutiques*. 2004;7(3):332-6.
 28. Huerta C, Castellsague J, Varas-Lorenzo C, et al. Nonsteroidal anti-inflammatory drugs and risk of ARF in the general population. *American journal of kidney diseases : the official journal of the National Kidney Foundation*. 2005;45(3):531-9.
 29. Crofford LJ. COX-2: Where are we in 2003? - Specific cyclooxygenase-2 inhibitors and aspirin-exacerbated respiratory disease. *Arthritis Res Ther*. 2003;5(1):25-7.
 30. Goodwin SD, Glenny RW. Nonsteroidal anti-inflammatory drug-associated pulmonary infiltrates with eosinophilia. Review of the literature and Food and Drug Administration Adverse Drug Reaction reports. *Archives of internal medicine*. 1992;152(7):1521-4.
 31. Scully LJ, Clarke D, Barr RJ. Diclofenac induced hepatitis. 3 cases with features of autoimmune chronic active hepatitis. *Digestive diseases and sciences*. 1993;38(4):744-51.
 32. De Lédinghen V, Heresbach D, Fourdan O, et al. Anti-inflammatory drugs and variceal bleeding: a case-control study. *Gut*. 1999;44(2):270-3.
 33. Mockenhaupt M, Kelly JP, Kaufman D, et al. The risk of Stevens-Johnson syndrome and toxic epidermal necrolysis associated with nonsteroidal antiinflammatory drugs: a multinational perspective. *J Rheumatol*. 2003;30(10):2234-40.
 34. Rostom A, Dubé C, Lewin G, et al. Nonsteroidal anti-inflammatory drugs and cyclooxygenase-2 inhibitors for primary prevention of colorectal cancer: a systematic review prepared for the U.S. Preventive Services Task Force. *Annals of internal medicine*. 2007;146(5):376-89.
 35. Jafari S, Etminan M, Afshar K. Nonsteroidal anti-inflammatory drugs and prostate cancer: a systematic review of the literature and meta-analysis. *Canadian Urological Association journal = Journal de l'Association des urologues du Canada*. 2009;3(4):323-30.
 36. Takkouche B, Regueira-Méndez C, Etminan M. Breast cancer and use of nonsteroidal anti-inflammatory drugs: a meta-analysis. *Journal of the National Cancer Institute*. 2008;100(20):1439-47.
 37. Malas AG, M.Ali. Nonsteroidal anti-inflamatuvlar ilaçların gebelikteki toksisiteleri ile ilgili literatürle rin gözden geçirilmesi. *Süleyman Demirel Üniversitesi Tip Fakültesi Dergisi* 2003;10-(3)/50-52
 38. Ying X-h, Bao D-n, Jiang H-y, et al. Maternal non-steroidal anti-inflammatory drug exposure during pregnancy and risk of miscarriage: a systematic review and meta-analysis. *European Journal of Clinical Pharmacology*. 2022;78(2):171-80.

39. Antonucci R, Zaffanello M, Puxeddu E, et al. Use of Non-steroidal Anti-inflammatory Drugs in Pregnancy: Impact on the Fetus and Newborn. *Current drug metabolism*. 2012;13:474-90.
40. Perk J, De Backer G, Gohlke H, et al. European Guidelines on cardiovascular disease prevention in clinical practice (version 2012). The Fifth Joint Task Force of the European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice (constituted by representatives of nine societies and by invited experts). *European heart journal*. 2012;33(13):1635-701.
41. Holster IL, Valkhoff VE, Kuipers EJ, et al. New Oral Anticoagulants Increase Risk for Gastrointestinal Bleeding: A Systematic Review and Meta-analysis. *Gastroenterology*. 2013;145(1):105-12.e15.
42. Botting R. COX-1 and COX-3 inhibitors. *Thrombosis research*. 2003;110(5-6):269-72.
43. Bannuru RR, Osani MC, Vaysbrot EE, et al. OAR-SI guidelines for the non-surgical management of knee, hip, and polyarticular osteoarthritis. *Osteoarthritis and cartilage*. 2019;27(11):1578-89.
44. Blantz RC. Acetaminophen: acute and chronic effects on renal function. *American journal of kidney diseases : the official journal of the National Kidney Foundation*. 1996;28(1 Suppl 1):S3-6.
45. Roberts E, Delgado Nunes V, Buckner S, et al. Paracetamol: not as safe as we thought? A systematic literature review of observational studies. *Ann Rheum Dis*. 2016;75(3):552-9.
46. Lipworth L, Friis S, Mellemkjær L, et al. A population-based cohort study of mortality among adults prescribed paracetamol in Denmark. *Journal of Clinical Epidemiology*. 2003;56(8):796-801.
47. Rahme E, Barkun A, Nedjar H, et al. Hospitalizations for upper and lower GI events associated with traditional NSAIDs and acetaminophen among the elderly in Quebec, Canada. *The American journal of gastroenterology*. 2008;103(4):872-82.