

DAFTAR PUSTAKA

- Altinoz, M.A. and Korkmaz, R. 2004. NF-kB, macrophage migration inhibitory factor and cyclooxygenase-inhibitions as likely mechanisms behind the acetaminophen-and NSAID-prevention of the ovarian cancer Minireview. *Neoplasma*, 51, pp.239-247.
- Anderson, B.J.. 2008. Paracetamol (Acetaminophen): mechanisms of action. *Paediatr Anaesth*, 18(10), pp.915-921.
- Baigent, C. and Patrono, C. 2003. Selective cyclooxygenase 2 inhibitors, aspirin, and cardiovascular disease: a reappraisal. *Arthritis Rheum*, 48(1), pp.12-20.
- Baskın, V., Bilge, S.S., Bozkurt, A., Akyüz, B., Ağrı, A.E., Güzel, H. and İlkaya, F. 2016. Effect of nonsteroidal anti-inflammatory drugs on colorectal distension-induced visceral pain. *Indian J Pharmacol*, 48(2), p.150.
- Bjarnason, I. and Hayllar, J. 1993. Side effects of nonsteroidal anti-inflammatory drugs on the small and large intestine in humans. *Gastroenterology*, 104(6), pp.1832-1847.
- Bhatt, D.L., Scheiman, J., Abraham, N.S., Antman, E.M., Chan, F.K., Furberg, C.D., Johnson, D.A., Mahaffey, K.W., Quigley, E.M., Harrington, R.A. and Bates, E.R. 2008. ACCF/ACG/AHA 2008 expert consensus document on reducing the gastrointestinal risks of antiplatelet therapy and NSAID use: a report of the American College of Cardiology Foundation Task Force on Clinical Expert Consensus Documents. *J Am Coll Cardiol*, 52(18), pp.1502-1517.
- Bonnefont, J., Daulhac, L., Etienne, M., Chapuy, E., Mallet, C., Ouchchane, L., Deval, C., Courade, J.P., Ferrara, M., Eschaliere, A. and Clottes, E., 2007. Acetaminophen recruits spinal p42/p44 MAPKs and GH/IGF-1 receptors to produce analgesia via the serotonergic system. *Mol Pharmacol*, 71(2), pp.407-415.
- Bosmans, J.W., Jongen, A.C., Bouvy, N.D. and Derikx, J.P. 2015. Colorectal anastomotic healing: why the biological processes that lead to anastomotic leakage should be revealed prior to conducting intervention studies. *BMC Gastroenterol*, 15(1), p.180.
- Buckley, M.M.T. and Brogden, R.N. 1990. Ketorolac. *Drugs*, 39(1), pp.86-109.
- Buckmire, M.A., Parquet, G., Greenway, S. and Rolandelli, R.H. 1998. Temporal expression of TGF- β 1, EGF, and PDGF-BB in a model of colonic wound healing. *J Surg Res*, 80(1), pp.52-57.

- Busti, A.J., Hooper, J.S., Amaya, C.J. and Kazi, S. 2005. Effects of perioperative antiinflammatory and immunomodulating therapy on surgical wound healing. *Pharmacotherapy*, 25(11), pp.1566-1591.
- Cahill, R.A., Sheehan, K.M., Scanlon, R.W., Murray, F.E., Kay, E.W. and Redmond, H.P. 2004. Effects of a selective cyclo-oxygenase 2 inhibitor on colonic anastomotic and skin wound integrity. *Br J Surg*, 91(12), pp.1613-1618.
- Chandrasekharan, N.V., Dai, H., Roos, K.L.T., Evanson, N.K., Tomsik, J., Elton, T.S. and Simmons, D.L., 2002. COX-3, a cyclooxygenase-1 variant inhibited by acetaminophen and other analgesic/antipyretic drugs: cloning, structure, and expression. *Proc Natl Acad Sci U S A*, 99(21), pp.13926-13931.
- Chang, J.K., Wang, G.J., Chuang, L.Y. and Ho, M.L., 2003. Effects of Nonsteroidal Anti-Inflammatory Drugs on Transforming Growth Factor- β Expression and Bioactivity in Rat Osteoblast-Enriched Cultures. *Kaohsiung J Med Sci*, 19(6), pp.278-287.
- Crofford, L.J., Lipsky, P.E., Brooks, P., Abramson, S.B., Simon, L.S. and Van De Putte, L. 2000. Basic biology and clinical application of specific cyclooxygenase-2 inhibitors. *Arthritis Rheum*, 43(1), pp.4-13.
- Daams, F., Luyer, M. and Lange, J.F. 2013. Colorectal anastomotic leakage: aspects of prevention, detection and treatment. *World J Gastroenterol*, 19(15), p.2293.
- De Hingh, I.H.J.T., Van Goor, H., De Man, B.M., Lomme, R.M.L.M., Bleichrodt, R.P. and Hendriks, T. 2006. Selective cyclo-oxygenase 2 inhibition affects ileal but not colonic anastomotic healing in the early postoperative period. *Br J Surg*, 93(4), pp.489-497.
- De Luna-Bertos, E., Ramos-Torrecillas, J., García-Martínez, O., Guildford, A., Santin, M. and Ruiz, C. 2013. Therapeutic doses of nonsteroidal anti-inflammatory drugs inhibit osteosarcoma MG-63 osteoblast-like cells maturation, viability, and biomineralization potential. *ScientificWorldJournal*, 2013.
- Drakopoulou, S., Kontis, E., Pantiora, E., Vezakis, A., Karandrea, D., Aravidou, E., Konti-Paphiti, A., Argyra, E., Voros, D., Polydorou, A.A. and Fragulidis, G.P. 2016. Effects of Lornoxicam on Anastomotic Healing: A Randomized, Blinded, Placebo-Control Experimental Study. *Surg Res Pract*, 2016.
- Drescher, D.G., Vogt, J., Gabriel, M., Baumgart, J., Schimanski, C.C., Lang, H. and Gockel, I. 2012. Model of wound healing for esophagogastric anastomoses in rats. *Eur Surg Res*, 48(4), pp.194-199.
- Duncan, M.R., Frazier, K.S., Abramson, S., Williams, S., Klapper, H., Huang, X. and Grotendorst, G.R., 1999. Connective tissue growth factor mediates

transforming growth factor β -induced collagen synthesis: down-regulation by cAMP. *FASEB J*, 13(13), pp.1774-1786.

Dupin, J.P., Gravier, D., Casadebaig, F., Boisseau, M.R. and Bernard, H., 1988. In vitro antiaggregant activity of paracetamol and derivatives. *Thromb Res*, 50(3), pp.437-447.

Erpek, S., Kilic, N., Kozaci, D., Dikicioglu, E. and Kavak, T. 2006. Effects of flunixin meglumine, diclofenac sodium and metamizole sodium on experimental wound healing in rats. *Rev Med Vet*, 157(4), p.185.

Esen, E., Sucullu, I., Sinan, H., Küçükodaci, Z., Filiz, A.I., Yucel, E. and Akin, M.L. 2008. The effects of non-steroid anti-inflammatory drugs on healing of colonic anastomosis in rats. *East J Med*, 13(1/2), p.13.

FitzGerald, G.A. and Patrono, C. 2001. The coxibs, selective inhibitors of cyclooxygenase-2. *N Engl J Med*, 345(6), pp.433-442.

Goldstein, J.L. and Cryer, B. 2015. Gastrointestinal injury associated with NSAID use: a case study and review of risk factors and preventative strategies. *Drug Health Patient Saf*, 7, p.31.

Gonzalez, A.C.D.O., Costa, T.F., Andrade, Z.D.A. and Medrado, A.R.A.P. 2016. Wound healing-A literature review. *Anais brasileiros de dermatologia*, 91(5), pp.614-620.

Graham, G.G., Davies, M.J., Day, R.O., Mohamudally, A. and Scott, K.F. 2013. The modern pharmacology of paracetamol: therapeutic actions, mechanism of action, metabolism, toxicity and recent pharmacological findings. *Inflammopharmacology*, 21(3), pp.201-232.

Gulcicek, O.B., Solmaz, A., Yigitbas, H., Ercetin, C., Yavuz, E., Ozdogan, K., Biricik, A., Akkalp, A.K., Uzun, H., Kutnu, M. and Celebi, F. 2017. Role of diclofenac sodium and paracetamol on colonic anastomosis: An experimental rodent model. *Asian J Surg*.

Haws, M.J., Kucan, J.O., Roth, A.C., Suchy, H. and Brown, R.E. 1996. The effects of chronic ketorolac tromethamine (toradol) on wound healing. *Ann Plast Surg*, 37(2), pp.147-151.

Hazut, O., Shaashua, L., Benish, M., Levi, B., Sorski, L., Benjamin, B., Hoffman, A., Zmora, O. and Ben-Eliyahu, S. 2011. The effect of β -adrenergic blockade and COX-2 inhibition on healing of colon, muscle, and skin in rats undergoing colonic anastomosis. *Int J Clin Pharmacol Ther*, 49(9), p.545.

Hendriks, T., Martens, M.F.M.W., Huyben, C.M.L.C. and Wobbes, T. 1993. Inhibition of basal and TGF β -induced fibroblast collagen synthesis by antineoplastic agents. Implications for wound healing. *Br J Cancer*, 67(3), pp.545-550.

- Hendriks, T. and Mastboom, W.J. 1990. Healing of experimental intestinal anastomoses. *Dis Colon Rectum*, 33(10), pp.891-901.
- Hesp, F.L., Hendriks, T., Lubbers, E.J.C. and Herman, H.M. 1984. Wound healing in the intestinal wall. *Dis Colon Rectum*, 27(2), pp.99-104.
- Holmer, C., Praechter, C., Mecklenburg, L., Heimesaat, M., Rieger, H. and Pohlen, U. 2014. Anastomotic stability and wound healing of colorectal anastomoses sealed and sutured with a collagen fleece in a rat peritonitis model. *Asian J Surg*, 37(1), pp.35-45.
- Krischak, G.D., Augat, P., Claes, L., Kinzl, L. and Beck, A. 2007. The effects of non-steroidal anti-inflammatory drug application on incisional wound healing in rats. *J Wound Care*, 16(2), pp.76-78.
- Ji, C., Xiong, Y., Pan, X., Guo, X., Li, Z., Qian, S., Xu, C., Yu, D.H. and Liao, W.Q. 2015. Effect of non-steroidal anti-inflammatory drugs on the increasing the incidence of colonic anastomosis in rats. *Int J Clin Exp Pathol*, 8(6), p.6126.
- Klein, M., Gögenur, I. and Rosenberg, J. 2012. Postoperative use of non-steroidal anti-inflammatory drugs in patients with anastomotic leakage requiring reoperation after colorectal resection: cohort study based on prospective data. *Bmj*, 345, p.6166.
- Kotagal, M., Hakkarainen, T.W., Simianu, V.V., Beck, S.J., Alfonso-Cristancho, R. and Flum, D.R. 2016. Ketorolac Use and Postoperative Complications in Gastrointestinal Surgery. *Ann Surg*, 263(1), pp.71-75.
- Konijnenbelt-Peters, J., Heijden, C., Ekhart, C., Bos, J., Bruhn, J. and Kramers, C. 2017. Metamizole (Dipyrone) as an Alternative Agent in Postoperative Analgesia in Patients with Contraindications for Nonsteroidal Anti-Inflammatory Drugs. *Pain Practice*, 17(3), pp.402-408.
- Le Grevès, S.S., Bremseth, P.L., Biagini, M., Holst, R. and Qvist, N. 2015. Effect of Postoperative Diclofenac on Anastomotic Strength and Histologic Healing in Rabbit Small Intestine. *Int Surg*, 100(11), pp.1435-1442.
- Lodish, H., Berk, A.Z.S.L., Zipursky, S.L., Matsudaira, P., Baltimore, D. and Darnell, J. 2000. Protein structure and function. *Molecular Cell Biology*, 4th Edition WH Freeman, New York.
- Mantzoros, I., Kanellos, I., Angelopoulos, S., Koliakos, G., Pramateftakis, M.G., Kanellos, D., Zacharakis, E., Zaraboukas, T. and Betsis, D. 2006. The effect of insulin-like growth factor I on healing of colonic anastomoses in cortisone-treated rats. *Dis Colon Rectum*, 49(9), pp.1431-1438.
- Marcum, Z.A. and Hanlon, J.T. 2010. Recognizing the risks of chronic nonsteroidal anti-inflammatory drug use in older adults. *Ann Longterm Care*, 18(9), p.24.

- Marjanovic, G. and Hopt, U.T., 2011. Physiologie der Anastomosenheilung. *Chirurg*, 82(1), pp.41-47.
- Marret, E., Kurdi, O., Zufferey, P. and Bonnet, F. 2005. Effects of Nonsteroidal Antiinflammatory Drugs on Patient-controlled Analgesia Morphine Side Effects Meta-analysis of Randomized Controlled Trials. *Anesthesiology*, 102(6), pp.1249-1260.
- Martens, M.F., Huyben, C.M. and Hendriks, T.H. 1992. Collagen synthesis in fibroblasts from human colon: regulatory aspects and differences with skin fibroblasts. *Gut*, 33(12), pp.1664-1670.
- Martin, L.D., Jimenez, N. and Lynn, A.M. 2017. A review of perioperative anesthesia and analgesia for infants: updates and trends to watch. *F1000Res*, 6.
- Mastboom, W.J.B., Hendriks, T., van Elteren, P. and De Boer, H.H.M. 1991. The influence of NSAIDs on experimental intestinal anastomoses. *Dis Colon Rectum*, 34(3), pp.236-243.
- McDaid, C., Maund, E., Rice, S., Wright, K., Jenkins, B. and Woolacott, N. 2010. Paracetamol and selective and non-selective non-steroidal anti-inflammatory drugs (NSAIDs) for the reduction of morphine-related side effects after major surgery: a systematic review. *Health Technol Assess*.
- McDermott, F.D., Heeney, A., Kelly, M.E., Steele, R.J., Carlson, G.L. and Winter, D.C. 2015. Systematic review of preoperative, intraoperative and postoperative risk factors for colorectal anastomotic leaks. *Br J Surg*, 102(5), pp.462-479
- Meade, E.A., Smith, W.L. and Dewitt, D.L. 1993. Differential inhibition of prostaglandin endoperoxide synthase (cyclooxygenase) isozymes by aspirin and other non-steroidal anti-inflammatory drugs. *J Biol Chem*, 268(9), pp.6610-6614.
- Midwood, K.S., Williams, L.V. and Schwarzbauer, J.E. 2004. Tissue repair and the dynamics of the extracellular matrix. *Int J Biochem Cell Biol*, 36(6), pp.1031-1037.
- Montesano, R. and Orci, L. 1988. Transforming growth factor beta stimulates collagen-matrix contraction by fibroblasts: implications for wound healing. *Proc Natl Acad Sci U S A*, 85(13), pp.4894-4897.
- Murrell, Z.A. and Stamos, M.J. 2006. Reoperation for anastomotic failure. *Clinics in colon and rectal surgery*, 19(04), pp.213-216.
- Muscará, M.N., McKnight, W., Asfaha, S. and Wallace, J.L. 2000. Wound collagen deposition in rats: effects of an NO-NSAID and a selective COX-2 inhibitor. *Br J Pharmacol*, 129(4), pp.681-686.

- Miltyk, W., Karna, E. and Pałka, J. 1996. Inhibition of prolidase activity by non-steroid antiinflammatory drugs in cultured human skin fibroblasts. *Pol J Pharmacol*, 48(6), pp.609-613.
- Mizuno, H., Sakamoto, C., Matsuda, K., Wada, K., Uchida, T., Noguchi, H., Akamatsu, T. and Kasuga, M. 1997. Induction of cyclooxygenase 2 in gastric mucosal lesions and its inhibition by the specific antagonist delays healing in mice. *Gastroenterology*, 112(2), pp.387-397.
- Mroszczak, E.J., Jung, D., Yee, J., Bynum, L., Sevelius, H. and Massey, I., 1990. Ketorolac tromethamine pharmacokinetics and metabolism after intravenous, intramuscular, and oral administration in humans and animals. *Pharmacotherapy*, 10(6P2).
- Naito, M., Sato, T., Nakamura, T., Yamanashi, T., Miura, H., Tsutsui, A. and Watanabe, M. 2017. Pain management using acetaminophen throughout postoperative course of laparoscopic colorectal surgery: A case-matched control study. *Ann Med Surg (Lond)*, 17, pp.38-42.
- Neuss, H., Raue, W., Müller, V., Weichert, W., Schwenk, W. and Mall, J.W. 2009. Effects of cyclooxygenase inhibition on anastomotic healing following large bowel resection in a rabbit model—a randomized, blinded, placebo-controlled trial. *Int J Colorectal Dis*, 24(5), pp.551-557.
- Pommergaard, H.C., Klein, M., Burcharth, J., Rosenberg, J. and Dahl, J.B. 2014. Variation in postoperative non-steroidal anti-inflammatory analgesic use after colorectal surgery: a database analysis. *BMC Anesthesiol*, 14(1), p.18.
- Powell, D. W., R. C. Mifflin, J. D. Valentich, S. E. Crowe, J. I. Saada, and A. B. West. "Myofibroblasts. II. Intestinal subepithelial myofibroblasts." *Am J Physiol Cell Physiol*, 277, no. 2 (1999): C183-C201.
- Rehn, M., Krarup, P.M., Christensen, L.H., Seidelin, J.B., Ågren, M.S. and Syk, I. 2015. GM6001 increases anastomotic leakage following colonic obstruction possibly by impeding epithelialization. *Surg Infect (Larchmt)*, 16(6), pp.702-708.
- Rijcken, E., Sachs, L., Fuchs, T., Spiegel, H.U. and Neumann, P.A. 2014. Growth factors and gastrointestinal anastomotic healing. *J Surg Res*, 187(1), pp.202-210.
- Rushfeldt, C.F., Sveinbjörnsson, B., Søreide, K. and Vonen, B. 2011. Risk of anastomotic leakage with use of NSAIDs after gastrointestinal surgery. *Int J Colorectal Dis*, 26(12), pp.1501-1509.
- Rutegård, J. and Rutegård, M. 2012. Non-steroidal anti-inflammatory drugs in colorectal surgery: A risk factor for anastomotic complications?. *World J Gastrointest Surg*, 4(12), p.278.

- Schlachta, C.M., Burpee, S.E., Fernandez, C., Chan, B., Mamazza, J. and Poulin, E.C. 2007. Optimizing recovery after laparoscopic colon surgery (ORAL-CS). *Surg Endosc*, 21(12), pp.2212-2219.
- Shimada, S.G., Otterness, I.G. and Stitt, J.T. 1994. A study of the mechanism of action of the mild analgesic dipyron. *Inflamm Res*, 41(3), pp.188-192.
- Simmons, J.G., Pucilowska, J.B., Keku, T.O. and Lund, P.K., 2002. IGF-I and TGF- β 1 have distinct effects on phenotype and proliferation of intestinal fibroblasts. *Am J Physiol Gastrointest Liver Physiol*, 283(3), pp.G809-G818.
- Stumpf, M., Cao, W., Klinge, U., Klosterhalfen, B., Kasperk, R. and Schumpelick, V. 2002. Collagen distribution and expression of matrix metalloproteinases 1 and 13 in patients with anastomotic leakage after large-bowel surgery. *Langenbecks Arch Surg*, 386(7), pp.502-506.
- Surazyński, A., Pałka, J. and Wolczyński, S. 2004. Acetylsalicylic acid-dependent inhibition of collagen biosynthesis and β 1-integrin signaling in cultured fibroblasts. *Med Sci Monit*, 10(6), pp.BR175-BR179.
- Syk, I., Mirastschijski, U., Jeppsson, B.W. and Ågren, M.S. 2003. Experimental colonic obstruction increases collagen degradation by matrix metalloproteinases in the bowel wall. *Dis Colon Rectum*, 46(9), pp.1251-1259.
- Tsai, W.C., Hsu, C.C., Chou, S.W., Chung, C.Y., Chen, J. and Pang, J.H.S. 2007. Effects of celecoxib on migration, proliferation and collagen expression of tendon cells. *Connect Tissue Res*, 48(1), pp.46-51.
- Tsujii, M., Kawano, S. and DuBois, R.N. 1997. Cyclooxygenase-2 expression in human colon cancer cells increases metastatic potential. *Proc Natl Acad Sci U S A*, 94(7), pp.3336-3340.
- van der Vijver, R.J., van Laarhoven, C.J., Lomme, R.M. and Hendriks, T. 2012. Paracetamol does not compromise early wound repair in the intestine or abdominal wall in the rat. *Anesth Analg*, 115(6), pp.1451-1456.
- Vane, J.R., Bakhle, Y.S. and Botting, R.M. 1998. CYCLOOXYGENASES 1 AND 2. *Annu Rev Pharmacol Toxicol*, 38(1), pp.97-120.
- Vuik, F.E.R., Koehestanie, P., Herbers, A.H.E. and Droste, J.T.S. 2017. Chronic use of metamizole: not so safe after all?. *Neth J Med*, 75(2), p.81.
- Witte, M.B. and Barbul, A. 1997. General principles of wound healing. *Surg Clin North Am*, 77(3), pp.509-528.
- Yaghoubi, S., Pourfallah, R., Barikani, A. and Kayalha, H. 2014. The postoperative analgesic effect of morphine and paracetamol in the patients undergoing laparotomy, using PCA method. *Glob J Health Sci*, 6(1), p.207.



UNIVERSITAS
GADJAH MADA

**STUDI IN VITRO PENGARUH ANTIINFLAMASI NON STEROID TERHADAP PRODUKSI KOLAGEN
FIBROBLAS KOLON TIKUS**

RASYA MAYONA, dr. Drvi Aris Agung Nugrahaningsih. M.Sc..Ph.D; dr. Eko Purnomo, Ph.D

Universitas Gadjah Mada, 2018 | Diunduh dari <http://etd.repository.ugm.ac.id/>

Zimmermann, K.C., Sarbia, M., Schrör, K. and Weber, A.A. 1998. Constitutive cyclooxygenase-2 expression in healthy human and rabbit gastric mucosa. *Mol Pharmacol*, 54(3), pp.536-540.