



The Effect of Esomeprazole on Postoperative Pain and Lung and Heart Complications in Rats

Didem ONK ¹, Resit COSKUN ², Oruc A. ONK ³, Ferda K. CIMEN ⁴,
Nezahat KURT ⁵, Bahadır SULEYMAN ⁶, Renad MAMMADOV ⁶, Durdu ALTUNER ⁶,
Vahdet GUL ⁷, Ismail MALKOC ⁸, Asli O. BILGIN ⁶ & Halis SULEYMAN ⁶ *

¹ Department of Anesthesiology and Reanimation, ² Department of Cardiology,

³ Department of Cardiovascular Surgery, ⁴ Department of Pathology,

⁶ Department of Pharmacology, ⁷ Department of Biochemistry,

Faculty of Medicine, Erzurum University, Erzurum, 24030, Turkey.

⁵ Department of Biochemistry, ⁸ Department of Anatomy, Faculty of Medicine,
Ataturk University, Erzurum, 25240, Turkey.

SUMMARY. Postoperative pain begins with tissue incision, continues with the production of free oxygen radicals, and is intensified by the inflammatory response. We investigated the effect of esomeprazole on postoperative pain and lung and heart complications of laparotomy. Albino Wistar-type rats were grouped into the paw scalpel incision (PSI), applied control (SIC), PSI + 20 mg/kg esomeprazole (SIE), PSI + 20 mg/kg meperidine (SIM), and healthy group (HG). For the laparotomy test, the rats were grouped as follows: laparotomy applied control (LTC), laparotomy + 20 mg/kg esomeprazole (LTE), laparotomy + 20 mg/kg meperidine (LTM), and healthy group (HG). Meperidine suppressed the PSI-induced pain. Esomeprazole decreased the level of oxidant and proinflammatory cytokines in the serum and lung and heart tissues of the LTE group and in the paw tissues of the SIE group, but meperidine did not. There were no histopathological findings in the lung and heart tissues of the LTE group, but tissue damage was found in the LTC and LTM groups. Esomeprazole may help reduce major surgery complications.

RESUMEN. El dolor postoperatorio comienza con la incisión de tejido, continúa con la producción de radicales libres de oxígeno y se intensifica por la respuesta inflamatoria. Investigamos el efecto del esomeprazol sobre el dolor postoperatorio y las complicaciones pulmonares y cardíacas de la laparotomía. Ratas Albino Wistar fueron agrupadas en incisión de bisturí de pata (PSI), control aplicado (SIC), PSI + 20 mg/kg de esomeprazol (SIE), PSI + 20 mg/kg de meperidina (SIM) y grupo saludable (HG). Para la prueba de laparotomía, las ratas se agruparon de la siguiente manera: control aplicado por laparotomía (LTC), laparotomía + 20 mg/kg de esomeprazol (LTE), laparotomía + 20 mg/kg de meperidina (LTM) y grupo sano (HG). La meperidina suprimió el dolor inducido por PSI. El esomeprazol disminuyó el nivel de citocinas oxidantes y proinflamatorias en los tejidos de suero, pulmón y corazón del grupo LTE y en los tejidos de la pata del grupo SIE, pero la meperidina no lo hizo. No hubo hallazgos histopatológicos en los tejidos pulmonares y cardíacos del grupo LTE, pero se encontró daño tisular en los grupos LTC y LTM. Esomeprazol puede ayudar a reducir complicaciones mayores de cirugía.

KEY WORDS: esomeprazole, laparotomy, meperidine, postoperative pain, scalpel incision.

* Author to whom correspondence should be addressed. E-mail: halis.suleyman@gmail.com