

PENGARUH PEMBERIAN KURKUMINOID DAN MINYAK ATSIRI RIMPANG KUNYIT (*CURCUMA LONGA*) SEBAGAI POTENSIAL FITOFARMAKA TERHADAP STRUKTUR USUS HALUS MENCIT GALUR BALB/C

ABSTRAK

Latar Belakang: Usus halus adalah organ pencernaan yang terbagi menjadi 3 bagian, yaitu duodenum, jejunum, dan ileum. Adanya kerusakan struktur usus halus, dapat menyebabkan gangguan penyerapan nutrisi dan gangguan fungsional lainnya. Gangguan pada usus halus banyak disebabkan dari penggunaan obat-obatan, seperti NSAID yang sering digunakan untuk analgetik, tetapi memberikan efek samping berupa kerusakan usus halus. Alternatif analgetik lain yang bisa digunakan adalah kunyit karena mengandung kurkuminoid dan minyak atsiri yang telah terbukti mengurangi rasa nyeri dan inflamasi. Oleh karena itu, pemberian kurkuminoid dan minyak atsiri kunyit perlu diteliti lebih lanjut untuk melihat potensi serta keamanannya pada usus halus.

Tujuan: Mengetahui efek dari pemberian kurkuminoid kunyit, minyak atsiri kunyit, dan kombinasi keduanya terhadap kerusakan epitelium dan infiltrasi sel radang usus halus mencit.

Metode: Penelitian ini dilakukan secara *eksperimental post-test only* yang terdiri dari 6 kelompok, yaitu kelompok normal (KN), kelompok pelarut CMC-Na (K1), kontrol positif piroxicam (K2), perlakuan kurkuminoid 48 mg/KgBB (P1), perlakuan minyak atsiri 24 mg/KgBB (P2), dan perlakuan kombinasi kurkuminoid + minyak atsiri + CMC-Na (P3). Semua perlakuan diberikan satu kali setiap hari selama 21 hari secara oral. Induksi formalin 1% sebanyak 20 μ L diinjeksikan secara *intraplantar* pada hari ke-21. Data derajat kerusakan usus halus dinilai dengan melihat kerusakan epitelium dan tingkat infiltrasi sel radang. Analisis data menggunakan *Kruskall-Wallis Test* dan *Pairwise Comparison Test*.

Hasil: Uji *Pairwise Comparison Test* menunjukkan tidak terdapat perbedaan inflamasi untuk parameter erosi epitel dan lokasi sel radang dengan nilai $p > 0,05$. Untuk parameter densitas sel radang kelompok P1 dengan K2, P2 dengan K2, dan KN dengan K2 menunjukkan terdapat perbedaan inflamasi dengan nilai $p < 0,05$.

Kesimpulan: Pemberian kurkuminoid dan minyak atsiri secara terpisah mampu memberikan inflamasi sel radang yang lebih ringan dibandingkan dengan pemberian piroxicam tetapi belum optimal dalam mencegah kerusakan epitelium.

Kata kunci: Kunyit, kurkuminoid, minyak atsiri, usus halus, antinyeri, antiinflamasi.

THE EFFECT OF CURCUMINOIDS AND TURMERIC RHIZOME ESSENTIAL OIL (*CURCUMA LONGA*) AS POTENTIAL PHYTOPHARMACEUTICALS ON THE STRUCTURE OF THE SMALL INTESTINE OF BALB/C MICE

ABSTRACT

Background: The small intestine is a digestive organ that is divided into 3 parts, namely the duodenum, jejunum, and ileum. Damage to the structure of the small intestine can lead to impaired absorption of nutrients and other functional disorders. Many small intestine disorders are caused by the use of drugs, such as NSAIDs which are often used for analgesics, but have the side effect of damaging the small intestine. An alternative analgesic is turmeric, which contains curcuminoids and essential oils that have been shown to reduce pain and inflammation. Therefore, the administration of curcuminoids and turmeric essential oil needs to be studied further to see its potential and safety in the small intestine.

Objective To determine the effects of administering turmeric curcuminoids, turmeric essential oil, and the combination of both on epithelium damage and inflammatory cell infiltration of the small intestine of mice.

Methods: This study was conducted in a post-test only experimental manner consisting of 6 groups, namely the normal group (KN), CMC-Na solvent group (K1), piroxicam positive control (K2), curcuminoid treatment 48 mg/KgBB (P1), essential oil treatment 24 mg/KgBB (P2), and combined treatment of curcuminoid + essential oil + CMC-Na (P3). All treatments were given once daily for 21 days orally. Induction of 1% formalin as much as 20 μ L was injected intraplantar on the 21st day. Data on the degree of small intestinal damage was assessed by looking at epithelial damage and the level of inflammatory cell infiltration. Data were analyzed using Kruskal-Wallis Test and Pairwise Comparison Test.

Results: Pairwise Comparison Test shows no difference in inflammation for epithelial erosion parameters and inflammatory cell location with $p > 0.05$. For the inflammatory cell density parameter, groups P1 with K2, P2 with K2, and KN with K2 showed that there were differences in inflammation with a p value < 0.05 .

Conclusion: The administration of curcuminoids and essential oils separately was able to provide milder inflammation of inflammatory cells compared to the administration of piroxicam but was not optimal in preventing epithelial damage.

Keywords: Turmeric, curcuminoids, essential oil, small intestine, pain relief, anti-inflammatory.