

PENGARUH PEMBERIAN KOMBINASI MINYAK ATSIRI KUNYIT (*CURCUMA LONGA*) DAN KURKUMINOIDNYA TERHADAP EFEK ANALGETIK PADA MENCIT

INTISARI

Latar Belakang: Nyeri adalah pengalaman sensorik dan emosional akibat kerusakan jaringan yang dapat mempengaruhi kualitas hidup. NSAID (*Non-Steroidal Anti-Inflammatory Drugs*) banyak digunakan untuk mengatasi nyeri dan peradangan. Namun, penggunaan jangka panjang atau dosis tinggi NSAID berisiko meningkatkan efek samping seperti gangguan gastrointestinal dan peningkatan risiko penyakit kardiovaskular. Minyak atsiri dan kurkuminoid kunyit dikenal memiliki potensi sebagai analgetik untuk alternatif terapi. Namun, belum ada penelitian yang mengeksplorasi potensi analgetik dari kombinasi kedua senyawa tersebut. Oleh karena itu, penting untuk mengetahui potensi efek analgetik dari kombinasi minyak atsiri kunyit dan kurkuminoid sebagai alternatif yang lebih aman.

Tujuan: Mengetahui efek analgetik minyak atsiri kunyit (*Curcuma longa.*), kurkuminoid, dan kombinasi keduanya sebagai alternatif terapi meredakan nyeri.

Metode: Penelitian ini menggunakan metode eksperimental murni sederhana. Kurkuminoid diperoleh dari *Markherb*, penyedia senyawa herbal untuk keperluan riset dan penelitian, sementara minyak atsiri diperoleh dari destilasi air-uap B2P2TOOT, UPF Tawangmangu. Uji analgetik menggunakan metode formalin tes (20 μ L formalin 1%, intraplantar) pada mencit jantan galur Balb/C (30 $\pm$ 5g), berumur 2 bulan. Kelompok uji terdiri dari kontrol negatif, *piroxicam* 52 mg/kgBB p.o. (kontrol positif), kurkuminoid 48 mg/kgBB p.o., minyak atsiri 24 mg/kgBB p.o., serta kombinasi keduanya p.o.. Injeksi formalin dilakukan setelah 1 jam pemberian sampel. Data analgetik diukur berdasarkan waktu menjilat (*licking time*) pada fase I (menit 0-10) dan fase II (menit 10-30) pasca injeksi formalin. Nyeri pada fase I mengindikasikan nyeri di daerah perifer, sedangkan nyeri pada fase II terjadi di sistem saraf pusat (SSP).

Hasil: Penelitian ini melibatkan model hewan uji yang dibagi ke dalam kelompok perlakuan minyak atsiri kunyit, kurkuminoid, dan kombinasinya. Minyak atsiri kunyit menunjukkan daya analgetik 37,47 $\pm$ 13,80% (fase I) dan 50,57 $\pm$ 8,78% (fase II), sementara kurkuminoid 44,71 $\pm$ 29,31% (fase I) dan 67,33 $\pm$ 5,35% (fase II). Kombinasi keduanya tidak meningkatkan efek analgetik dibandingkan pemberian terpisah. Pada fase II, daya analgetik kombinasi lebih rendah (24,67 $\pm$ 12,99%) secara signifikan ($p < 0,05$). Pada fase I, kesimpulan tidak dapat ditarik karena standar deviasi tinggi (44,71 $\pm$ 29,31%).

Kesimpulan: Minyak atsiri dan kurkuminoid terbukti memiliki efek analgetik pada fase nyeri perifer (I) dan sistem saraf pusat (II). Namun, pada fase II, daya analgetik lebih rendah (24,67 $\pm$ 12,99%) dibandingkan pemberian masing-masing secara terpisah ($p < 0,05$). Sementara itu, pada fase I, standar deviasi daya analgetik kelompok kurkuminoid sangat tinggi (44,71 $\pm$ 29,31%), sehingga penelitian lebih lanjut masih diperlukan.

Kata Kunci: Kunyit, Nyeri, Analgetik, NSAID, Kurkuminoid, Minyak atsiri

THE EFFECT OF ADMINISTERING A COMBINATION OF TURMERIC ESSENTIAL OIL (CURCUMA LONGA) AND ITS CURCUMINOIDS ON ANALGESIC EFFECTS IN MICE

ABSTRACT

Background: Pain is the sensory and emotional experience of tissue damage that can affect quality of life. NSAIDs (Non-Steroidal Anti-Inflammatory Drugs) are widely used to treat pain and inflammation. However, long-term use or high doses of NSAIDs risk increased side effects such as gastrointestinal distress and increased risk of cardiovascular disease. Turmeric essential oil and curcuminoids are known to have potential as analgesics for therapeutic alternatives. However, no studies have explored the analgesic potential of the combination of the two compounds. Therefore, it is important to determine the potential analgesic effect of the combination of turmeric essential oil and curcuminoids as a safer alternative.

Objectives: Knowing the analgesic effect of turmeric essential oil (*Curcuma longa*), curcuminoids, and the combination of both as an alternative therapy to relieve pain.

Methods: This study used a simple pure experimental method. Curcuminoids were obtained from Markherb, a provider of herbal compounds for research and study purposes, while essential oil was obtained from steam-water distillation. The analgesic test used the formalin test method (20 μ L of 1% formalin, intraplantar) on male Balb/C mice (30 $\pm$ 5g), 2 months old. The test groups consisted of negative control, piroxicam 52 mg/kgBB p.o. (positive control), curcuminoids 48 mg/kgBB p.o., essential oil 24 mg/kgBB p.o., and their combination p.o. Formalin injection was done after 1 hour of sample administration. Analgesic data were measured based on licking time in phase I (minutes 0-10) and phase II (minutes 10-30). Pain in phase I indicates pain in the peripheral region, while pain in phase II occurs in the central nervous system (CNS).

Results: This study involved a test animal model divided into treatment groups of turmeric essential oil, curcuminoids, and their combination. Turmeric essential oil showed analgesic power of $37.47 \pm 13.80\%$ (phase I) and $50.57 \pm 8.78\%$ (phase II), while curcuminoids $44.71 \pm 29.31\%$ (phase I) and $67.33 \pm 5.35\%$ (phase II). The combination of the two did not increase the analgesic effect compared to separate administration. In phase II, the analgesic power of the combination was significantly lower ($24.67 \pm 12.99\%$) ($p < 0.05$). In phase I, no conclusion could be drawn due to high standard deviation ($44.71 \pm 29.31\%$).

Conclusion: Essential oils and curcuminoids were shown to have analgesic effects in the peripheral (I) and central nervous system (II) phases of pain. However, in phase II, analgesic power of combination ($24.67 \pm 12.99\%$) was significantly lower ($p < 0.05$) than curcuminoid alone ($44.71 \pm 29.31\%$) or essential oil alone ($37.47 \pm 13.80\%$). Meanwhile, in phase I, the standard deviation of the analgesic power of the curcuminoid group was very high ($44.71 \pm 29.31\%$), so further research is still needed.

Keywords: Turmeric, Pain, Analgesic, NSAID, Curcuminoids, Essential oil