

# Kadar Kurkumin pada Ginjal Tikus Setelah Pemberian Kurkumin Oral atau Kurkumin Nanopartikel = Comparison between Curcumin Concentrations in Rat Kidney Following Oral Administration of Conventional or Nanoparticle Form

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## Abstrak

**Pendahuluan.** Kurkumin merupakan senyawa alami yang ditemukan pada akar tumbuhan *Curcuma longa*. Kurkumin memiliki sifat penyembuhan yang sangat baik, diantaranya termasuk anti-inflamasi, anti-bakteri, dan antioksidan. Telah dijelaskan pula pada beberapa studi bahwa kurkumin memiliki sifat *renoprotective* yang dapat membantu memperbaiki penyakit gagal ginjal kronik (CKD). Meskipun kurkumin memiliki banyak manfaat kesehatan untuk ginjal, jumlah kurkumin yang dapat mencapai jaringan ginjal sangatlah sedikit. Hal ini dikarenakan bioavailabilitas oral kurkumin hanya mencapai 1% yang disebabkan oleh buruknya absorpsi kurkumin pada saluran pencernaan. Penelitian ini bertujuan untuk meningkatkan konsentrasi kurkumin pada organ/jaringan ginjal dengan cara memperkecil ukuran partikel kurkumin menjadi

**Metode.** Penelitian ini menggunakan sediaan nanokurkumin yang dibuat dengan teknik ball milling. Dosis tunggal kurkumin atau nanokurkumin sebanyak 500 mg/kg diberikan secara oral kepada tikus Sprague-Dawley betina. Tikus didekapitasi pada menit ke-180 dan -240 setelah pemberian kurkumin atau nanokurkumin untuk pengambilan organ ginjal yang nantinya setiap 100 mg jaringan ginjal akan dihomogenisasi dengan larutan Normal Saline 0.9% sebanyak 1 ml. Homogenat jaringan ginjal akan dianalisa menggunakan UPLC-MS/MS dengan sumber ionisasi electrospray (ESI) positif.

**Hasil.** Konsentrasi kurkumin cenderung lebih tinggi dibandingkan konsentrasi nanokurkumin pada jaringan ginjal tikus setelah pemberian dosis tunggal kurkumin/nanokurkumin sebanyak 500 mg/kg pada jam ke-3 dan ke-

**Kesimpulan.** Kurkumin cenderung untuk memiliki konsentrasi yang lebih tinggi dibandingkan konsentrasi sediaan nanokurkumin pada jaringan ginjal tikus.

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**Introduction.** Curcumin is a naturally occurring compound found in *Curcuma longa* roots. It possesses great healing properties which mainly include anti-inflammatory, anti-bacterial, and anti-oxidative. It has also been described that curcumin has renoprotective effects and is proven to be able to ameliorate chronic kidney diseases (CKD). Despite having numerous health benefits for the kidney, the number of curcumin that can reach the kidney is very little, in respect to its low oral bioavailability which is only 1% due to poor absorption from the gastrointestinal tract. This study aims to enhance curcumin concentration in the kidney by decreasing curcumin particle size into nanocurcumin.

**Methods.** This study uses nanoparticle curcumin that is produced by using ball milling technique. A single dosage of 500 mg/kg curcumin or nanocurcumin was given orally to female Sprague-Dawley rats. Rats were decapitated at minute-180 and 240 after curcumin or nanocurcumin administration for kidney collection, which then homogenized with a ratio of 100 mg kidney tissue per 1 mL normal saline 0.9%. Kidney tissue homogenates were analyzed using UPLC-MS/MS with

positive electrospray ionization (ESI).

**Results.** Curcumin concentration in rats kidney tissue tended to be slightly higher than nanoparticle curcumin after a single dose of 500 mg/kg curcumin or nanocurcumin at both 3 and 4 hours.

**Conclusion.** Curcumin has the propensity to have a higher concentration than nanocurcumin in rats kidney tissue.