

Efek nanokurkumin terhadap fungsi ginjal dan inflamasi pada tikus model kanker ovarium yang mendapat cisplatin = The effects of nanocurcumin on kidney function and inflammatory markers in rat model of ovarian cancer treated with cisplatin

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Abstrak

Kemoterapi dengan cisplatin merupakan modalitas utama pada terapi pada kanker ovarium, walaupun telah diketahui toksisitasnya pada berbagai organ termasuk ginjal. Kurkumin, senyawa fenolik yang diperoleh dari *Curcuma longa*, diketahui memiliki efek proteksi pada ginjal akibat cisplatin pada berbagai model toksisitas *in vivo*. Namun, efek kurkumin pada ginjal dibatasi oleh bioavailabilitasnya yang rendah. Kelompok penelitian kami telah berhasil mengembangkan formulasi kurkumin nanopartikel baru yang telah terbukti memperbaiki efikasi cisplatin pada model kanker ovarium. Namun, belum diketahui apakah formulasi kurkumin nanopartikel ini juga dapat memperbaiki fungsi dan kondisi inflamasi pada ginjal yang disebabkan oleh cisplatin.

Metode Sebanyak 24 ekor tikus Wistar betina dibagi menjadi: 6 ekor tikus normal (sham treatment) dan 18 ekor tikus yang diinduksi menjadi kanker ovarium dengan DMBA. Tikus kanker ovarium dibagi menjadi 3 kelompok masing-masing 6 ekor yang menerima cisplatin 4 mg/kgBB/minggu atau cisplatin 4 mg/kgBB/minggu + kurkumin 100 mg/kgBB/hari atau cisplatin 4 mg/kgBB/minggu + nanokurkumin 100 mg/kgBB/hari. Terapi diberikan selama 4 minggu, kemudian dilakukan terminasi dan diambil darah dan organ ginjal untuk analisis penanda fungsi ginjal dan inflamasi.

Hasil Nanokurkumin dapat menurunkan kadar ureum serum signifikan dibandingkan kelompok cisplatin, namun tidak mempengaruhi kadar kreatinin dan sedikit menurunkan kadar neutrophil gelatinase-associated lipocalin (NGAL). Nanokurkumin tidak berhasil menurunkan kadar penanda inflamasi: TNF-, IL-1 dan IL-6.

Kesimpulan

Nanokurkumin memiliki kecenderungan untuk memperbaiki beberapa penanda fungsi ginjal dalam darah pada model kanker ovarium yang diberikan cisplatin, namun tidak mempengaruhi kadar penanda inflamasi di ginjal.

.....The effects of nanocurcumin on kidney function and inflammatory markers in rat model of ovarian cancer treated with cisplatin

Cisplatin remains the main modality of treatment for ovarian cancer, despite its known toxic effects to various organs, including the kidney. Curcumin, a phenolic compound derived from *Curcuma longa*, was known to have a renoprotective effect on cisplatin-induced *in vivo* models. However, the beneficial effect of curcumin on the kidney is limited by its low bioavailability. Our research group has successfully developed a novel curcumin nanoparticle formulation that has been shown to improve the efficacy of cisplatin in ovarian cancer models. However, it is not yet known whether this curcumin nanoparticle formulation can also improve kidney function and inflammatory conditions caused by cisplatin in ovarian cancer models.

Method

A total of 24 female Wistar rats were divided into: 6 normal rats (sham treatment) and 18 rats induced to develop ovarian cancer with DMBA. Ovarian cancer rats were divided into 3 groups of 6 each receiving cisplatin 4 mg/kgBW/week or cisplatin 4 mg/kgBW/week + curcumin 100 mg/kgBW/day or cisplatin 4 mg/kgBW/week + nanocurcumin 100 mg/day. kgBB/day. Therapy was given for 4 weeks, then terminated and blood and kidney were taken for analysis of markers of kidney function and inflammation.

Results

Nanocurcumin lowered serum urea levels significantly compared to the cisplatin group. However, nanocurcumin did not alter creatinine levels and slightly reduced serum neutrophil gelatinase-associated lipocalin (NGAL) concentrations. Nanocurcumin did not affect the inflammatory markers studied: TNF-, IL-1 and IL-6.

Conclusion

Nanocurcumin has a tendency to improve several markers of kidney function in cisplatin- treated ovarian cancer models. However, the effect was not associated by the alteration of inflammatory cytokines in the kidney.