Pengaruh Nanokurkumin terhadap kadar antioksidan endogen jaringan hati pada model kanker ovarium yang mendapat cisplatin pada tikus = Effects of Nanocurcumin on hepatic endogenous antioxidants in cisplatin-treated rat ovarian cancer model

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Abstrak

Latar Belakang: Cisplatin, agen kemoterapi utama dalam terapi kanker ovarium, memiliki sifat hepatotoksik karena menginduksi stres oksidatif. Kurkumin dapat meningkatkan kadar atau aktivitas antioksidan endogen seperti enzim superoksida dismutase dan glutation. Formulasi nanopartikel kurkumin dapat meningkatkan bioavailabilitas kurkumin dan distribusinya pada organ target. Penelitian ini bertujuan untuk mengetahui pengaruh nanokurkumin terhadap hepatotoksisitas akibat cisplatin melalui regulasi antioksidan endogen SOD dan GSH. Metode: 25 ekor tikus galur Wistar betina dibagi ke dalam 1 kelompok sham dan 4 kelompok model kanker ovarium yang diinduksi DMBA pada penelitian in-vivo ini. Empat kelompok tersebut adalah kelompok tanpa terapi, cisplatin 4 mg/KgBB intraperitoneal, cisplatin dengan kurkumin konvensional 100 mg/KgBB per oral, atau cisplatin dengan nanopartikel kurkumin dalam kitosan 100 mg/KgBB per oral. Setelah perlakuan selama 1 bulan, hepar tikus diambil dan disimpan beku. Pengukuran aktivitas SOD, kadar GSH, dan kadar GSSG dilakukan dengan metode spektrofotometri. Hasil: Uji statistik pada kadar GSH, GSSG, dan aktivitas SOD menunjukkan peningkatan yang signifikan pada kelompok ko-kemoterapi kurkumin konvensional dibanding monoterapi cisplatin ($p<0.05$). Tidak ada perbedaan yang bermakna antarkelompok pada rasio GSH/GSSG ($p>0.05$) dan tidak ditemukan perbedaan bermakna antara kedua kelompok ko-kemoterapi pada semua variabel ($p>0.05$). Kesimpulan: Kurkumin konvensional dan nanokurkumin setara dalam meregulasi antioksidan endogen SOD dan GSH pada tikus model kanker ovarium yang mendapat cisplatin.

.....Introduction: As the primary chemotherapeutic agent of choice for ovarian cancer, cisplatin has hepatotoxic properties via oxidative stress induction. Curcumin can increase the levels and activities of endogenous antioxidants like superoxide dismutase enzyme and glutathione. Formulation of curcumin nanoparticles increases its bioavailability and target organ distribution. This research aims to elucidate the effects of nanocurcumin on cisplatin-induced hepatotoxicity via regulation of endogenous antioxidants, SOD and GSH. Method: 25 Wistar female rats were grouped into 1 sham group and 4 DMBA-induced ovarian cancer model groups in this in-vivo study. Four cancer model groups were further divided into no-treatment, 100 mg/KgBW intraperitoneal cisplatin therapy, cisplatin with oral 100 mg/KgBW conventional curcumin, and cisplatin with oral 100 mg/KgBW

curcumin nanoparticle in chitosan group. The liver of the rats were taken and frozen after one month of treatment. Spectrophotometry was used to measure the activities of SOD, levels of GSH, and levels of GSSG. Results: Statistic tests on levels of GSH, GSSG, and activity of SOD showed significant increase in the curcumin cochemotherapy against cisplatin monotherapy ($p<0.05$). There was no significant difference within the groups of GSH/GSSG ratio ($p>0.05$) and no significant difference was found between the curcumin co-chemotherapy and nanocurcumin co-chemotherapy groups in all the variables ($p>0.05$). Conclusion: Conventional curcumin and nanocurcumin administration are similar in regulating endogenous antioxidants SOD and GSH on rats with ovarian cancer model treated with cisplatin.