

Perbandingan Apoptosis Sel Kanker Buli pada Pemberian Metformin, Cisplatin, dan Kombinasi Metformin-Cisplatin

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ABSTRAK

Tujuan: Untuk mengetahui efek metformin, cisplatin, dan kombinasi keduanya dalam menginduksi apoptosis sel kanker buli.

Bahan & Metode: Sel kanker buli (*urothelial cell line 5637*) dikultur hingga kepadatan 80%. Sel dipaparkan dengan metformin dan cisplatin dengan dosis tertentu selama 24 dan 48 jam. Uji sitotoksitas sel dilakukan dengan menghitung viabilitas sel kanker buli menggunakan metode MTT assay. Data IC_{50} metformin dan cisplatin yang didapatkan dari uji sitotoksitas sel selanjutnya digunakan untuk uji apoptosis dengan metode TUNEL assay. Tambahan dosis kombinasi yang digunakan dalam uji apoptosis yaitu : $\frac{1}{4} IC_{50}$ (metformin + cisplatin), $\frac{1}{2} IC_{50}$ (metformin + cisplatin), and IC_{50} (metformin + cisplatin).

Hasil: IC_{50} metformin adalah sebesar 15 μM sedangkan IC_{50} cisplatin sebesar 18 μM dengan waktu paparan selama 48 jam. Pada uji apoptosis ditemukan adanya perbedaan nilai rerata index apoptosis pada semua grup perlakuan dibandingkan dengan kontrol kecuali pada grup yang terpapar dengan IC_{50} metformin dan $\frac{1}{4} IC_{50}$ (metformin + cisplatin).

Kesimpulan: Metformin dosis IC_{50} tidak dapat meningkatkan apoptosis sel kanker buli. Sementara itu, cisplatin dosis IC_{50} dapat meningkatkan apoptosis sel kanker buli secara

COMPARISON OF BLADDER CANCER CELLS APOPTOSIS INDUCED BY METFORMIN, CISPLATIN, AND COMBINATION OF METFORMIN-CISPLATIN: IN VITRO STUDY

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ABSTRACT

Objective: To evaluate the effect of metformin, cisplatin, and their combination on apoptosis of bladder cancer cells.

Material & Methods: Urothelial cell lines 5637 were cultured until 80% confluence. Cells were exposed to metformin and cisplatin at certain doses for 24 and 48 hours. Cytotoxicity test was carried out by calculating the viability of bladder cancer cells using the MTT assay until IC_{50} of each drug was obtained. IC_{50} Metformin and Cisplatin obtained from the cytotoxicity test were used to induce apoptosis in bladder cancer cells using TUNEL assay. Additional combination doses of Metformin and cisplatin used to induce apoptosis were $\frac{1}{4} IC_{50}$ (metformin + cisplatin), $\frac{1}{2} IC_{50}$ (metformin + cisplatin), and IC_{50} (metformin + cisplatin).

Results: IC_{50} of metformin was 15 μ M while cisplatin was 18 μ M with a 48-hour exposure. There was a difference in the mean value of the apoptosis index in all treatment groups compared to control except for the group exposed to IC_{50} metformin and $\frac{1}{4} IC_{50}$ (metformin + cisplatin).

Conclusion: Metformin administration solely is not able to increase bladder cancer cell apoptosis. Conversely, the administration of Cisplatin can significantly increase bladder cancer cell apoptosis. The combination of Metformin and Cisplatin can significantly increase bladder cancer cell apoptosis. The rate of apoptosis in line with an increase dose of the combination of these two drugs.

Keywords: Metformin, Cisplatin, Cytotoxicity, Apoptosis