

RESEARCH ARTICLE

Antagonistic Effect of Soursop Leaf Aqueous Extract and Doxorubicin Combination in MCF7 and T47D Breast Cancer Cell

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Abstract

The success of breast cancer therapy is still not optimal and the side effects caused by breast cancer therapy. The use of standard drug combinations with herbs is often used as co-chemotherapy and is believed to increase the drug's effectiveness. However, research on the antagonistic effect of the drug combination is still minimal. This study examines the anticancer effect of soursop leaf aqueous extract and the combined impact of doxorubicin on MCF7 and T47D breast cancer cells. This research is pure *in vitro* experimental study of MCF7 and T47D breast cancer culture cells at the Parasitology Laboratory of the Faculty of Medicine, Universitas Gadjah Mada in August 2018. Toxicity tests were carried out using the method of tetrazolium 3-(4,5-dimethylthiazol-2-yl) 2,5-diphenyltetrazolium bromide (MTT) to calculate cell viability. The IC₅₀ value was obtained by analyzing probit regression calculation using SPSS software. The synergism of this compound with doxorubicin was determined based on the value of the Combination Index (CI) using a combination test with series 1/2 IC₅₀, 3/8 IC₅₀, 1/4 IC₅₀, and 1/8 IC₅₀ and the data was analyzed using Compusyn 1.0 software. In this study, the effect of soursop leaf preparations will be tested on T47D and MCF7 breast cancer cell cultures and assess the impacts of co-chemotherapy of soursop leaf aqueous extract with doxorubicin. This study showed that IC₅₀ soursop leaf aqueous extract in T47D breast cancer culture was 84 µg/mL and in MCF7 166.5 µg/mL. In contrast, the combined test showed that soursop leaf aqueous extract was antagonistic with doxorubicin in both T47D and MCF7 cancer cell cultures.

Keywords: Antagonistic effect, breast cancer, doxorubicin, MCF7, soursop leaf, T47D

Efek Antagonis Kombinasi Ekstrak Air Daun Sirsak dan Doksorubisin pada Kultur Sel Kanker MCF7 and T47D

Abstrak

Keberhasilan terapi kanker payudara saat ini masih belum optimal dan terdapat efek samping yang ditimbulkan dari terapi kanker payudara tersebut. Penggunaan kombinasi obat standar dengan herbal sering digunakan sebagai ko-kemoterapi dan diyakini dapat meningkatkan efektivitas obat, tetapi penelitian mengenai efek antagonis kombinasi obat masih sangat terbatas. Penelitian ini mengkaji efek antikanker ekstrak air daun sirsak dan kombinasinya dengan doksorubisin pada sel kanker payudara MCF7 dan T47D. Penelitian ini merupakan eksperimental murni secara *in vitro* pada sel kanker payudara MCF7 dan T47D di Laboratorium Parasitologi Fakultas Kedokteran Universitas Gadjah Mada periode Agustus 2018. Uji toksisitas dilakukan menggunakan metode *tetrazolium 3-(4,5-dimethylthiazol-2-yl) 2,5-diphenyltetrazolium bromide* (MTT) untuk menghitung viabilitas sel. Nilai IC₅₀ didapatkan melalui analisis menggunakan perhitungan regresi probit menggunakan perangkat lunak SPSS. Efek sinergis senyawa ini dengan doksorubisin ditentukan berdasar atas nilai Indeks Kombinasi (IK) menggunakan uji kombinasi dengan seri 1/2 IC₅₀, 3/8 IC₅₀, 1/4 IC₅₀, dan 1/8 IC₅₀ serta data dianalisis menggunakan perangkat lunak Compusyn 1.0. Efek sediaan daun sirsak pada penelitian ini akan diujikan terhadap kultur sel kanker payudara T47D dan MCF7 serta menilai efek ko-kemoterapi ekstrak air daun sirsak dengan doksorubisin. Hasil penelitian ini menunjukkan bahwa IC₅₀ ekstrak air daun sirsak pada kultur sel kanker T47D adalah 84 µg/mL dan pada kultur sel kanker MCF7 166.5 µg/mL, sedangkan uji kombinasi memperlihatkan bahwa ekstrak air daun sirsak berefek antagonis dengan doksorubisin pada kultur sel kanker T47D dan MCF7.

Kata kunci: Daun sirsak, doksorubisin, efek antagonis, kanker payudara, MCF7, T47D

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