INTISARI

Kanker payudara merupakan kanker yang memiliki insidensi tinggi di dunia dan Indonesia. Agen kemoterapi yang banyak digunakan pada terapi kanker payudara adalah doxorubicin. Akan tetapi, doxorubicin mempunyai efek samping dan dapat menyebabkan resistensi sehingga perlu dilakukan kombinasi untuk menurunkan efek samping. Ekstrak Eanolik Temulawak (EET) dan Ekstrak Etanolik Awar-Awar (EEA) telah terbukti memiliki aktivitas antikanker terhadap berbagai sel kanker. Oleh karena itu, perlu pengkajian mengenai kombinasi EET dan EEA sebagai agen kemopreventif pada sel kanker payudara. Penelitian ini bertujuan untuk menguji aktivitas kombinasi antara EETdan EEA maupun kombinasinya dengan doxorubicin, serta kemampuannyadalam memacu apoptosis dan memodulasi siklus sel pada sel kanker payudara T47D. Metode yang digunakan untuk uji kualitatif terhadap EET dan EEA dengan KLT, sedangkan untuk uji kuantitatif EET menggunakan densitometri. Uji sitotoksisitas tunggal maupun kombinasi dilakukan dengan MTT *assay*. Uji apoptosis dan pengamatan profil siklus sel dilakukan dengan *flowcytometry.*

Hasil penelitian menunjukkan bahwa kandungan senyawa dalam EEA terdapat alkaloid dan EET terdapat kurkumin. Pada EET terdapat senyawa kurkumin sebesar 13,77±0,61 µg/µl dalam 10 mg ekstrak. Selanjutya, dilakukan uji sitotoksik doxorubicin, EEA, dan EET terhadap sel T47D, dengan nilai IC_{50} sebesar 60 nM, 6 µg/ml, dan 30 µg/ml. Kombinasi ketiga senyawa uji menggunakan konsentrasi 1/6 IC_{50}, yakni EEA 1µg/ml, EET 5 µg/ml dan doxorubicin 10nM. Kombinasi tersebut mampu menurunkan viabilitas sel hingga 55,70% dan berefek sinergis dengan nilai *Combination Index* (CI) sebesar 0,63. Kombinasi tersebut menyebabkan modulasi siklus sel pada fase S (31,24%), dan sedikit menginduksi apoptosis pada inkubasi 24 jam.

Kata kunci: Ekstrak Etanolik Temulawak, Ekstrak Etanolik Awar-Awar doxorubicin, resisten, kanker payudara.

ABSTRACT

Breast Cancer is the cancer with the highest level of incidence both in Indonesia and in the world. Doxorubicin is the most proliferated chemotherapy agent for breast cancer therapy. Aside from the usage of single chemotherapy agent, co-chemotherapy which combine chemotherapy agent with another agent, is now being researched for clinical application. Co-chemotherapy effort is applied in order to reduce the side effect of chemotherapy and to increase the efficacy level of the doxorubicin. Furthermore, co-chemotherapy also conducted in order to hold the level of doxorubicin resistance of cancer cell which can make the therapy more efficient. Ethanolic Extract of Curcuma Rhizome (EEC) and Ethanolic Extract of Awar-Awar's Leaf (EEA) have been proved to have anticancer nature against many kinds of cancer cell. Therefore, further research needs to be done regarding the combination between EEA and EEC as a chemopreventive agent against breast cancer cell. This research is intended to test the combined activity between EEA and EEC and also its combination with doxorubicin as a chemotherapy agent. This research also test the ability of the combined activity in triggering the apoptosis process and modulating the cell cycle on breast cancer cell T47D. Single and combined cytotoxicity test are conducted using MTT assay. The apoptosis test and cell cycle profiling are done using flowcytometry. The combined usages of EEA and EEC in combination with doxorubicin are expected to enhance the level cytotoxicity by inducting apoptosis and modulating the cell cycle on cell T47D.

EEA and EEC showed cytotoxic effect on cell T47D with level of IC_{50} on 6 µg/ml and 30 µg/ml. Meanwhile the value of IC_{50} in doxorubicin is 60 nM. Those three compounds are then combined with IC_{50} concentric at 1/6. The combination between EEA (1µg/ml), EEC (5 µg/ml) and doxorubicin (10 nM) are able to lower the cell viability up to 55,70% and have a synergic effect with Combination Index (CI) value at 0,63. The combination of those three compounds resulted in accumulation of cell at the S phase (31,24%) and able to a few enhance the apoptosis. Those results proved tat EEA and EEC can be developed as a co-chemotherapy agent alongside with doxorubicin in order to improve the effectiveness of breast cancer therapy.

Keywords: Ethanolic Extract of Awar-Awar's, Ethanolic Extract of Curcuma Rhizome, doxorubicin, resistance , breast cancer.

.