Pengaruh Ekstrak *Artemisia vulgaris* terhadap Indeks Apoptosis dan *Caspase-8*

(Studi pada Adenokarsinoma Mammae Mencit C3H yang Diberi Regimen Kemoterapi Adriamycin-Cyclophosphamide)

Effect of Artemisia vulgaris Extract on Apoptosis Index and Caspase-8 Expression

(Study on Adenocarcinoma Mammae C3H Mice Given Adriamycin-Cyclophosphamide Chemotherapy Regimen)

KARYA ILMIAH PARIPURNA
untuk memenuhi persyaratan
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ABSTRAK

Pendahuluan : Insiden kanker payudara di dunia masih tinggi. Pembedahan tetap merupakan pilihan utama dengan modalitas lain berupa kemoterapi, radiasi, dan imunoterapi seperti *Artemisia vulgaris (AV)*.

Tujuan : Menganalisis peningkatan respon efek apoptosis *Adriamycin-Cyclophosphamide* pada adenokarsinoma mammae mencit C3H yang diberi ekstrak *Artemisia Vulgaris.*

Metode : Penelitian ini menggunakan desain "*Post test only control group design*" terhadap 24 ekor mencit C3H betina dipilih secara acak dan dibagi menjadi empat kelompok, yaitu : kelompok K (kontrol), P1 (kemoterapi), P2 (ekstrak), dan P3 (kombinasi). Adenokarsinoma mammae berasal dari inokulasi mencit donor. Kemoterapi Adriamycin 0,18 mg dan Cyclophosphamide 1,8 mg diberikan sebanyak 2 siklus. *AV* diberikan dengan dosis 13 mg (0,2 ml) sekali sehari peroral. Indeks apoptosis dan *Caspase-8* dinilai dengan pengecatan imunohistokimia

Hasil : Rerata indeks apoptosis dan *Caspase-8* didapatkan kelompok K, P1, P2, P3 berturut-turut $22,06 \pm 1,73$, $37,16 \pm 1,20$, $24,60 \pm 1,08$, $39,78 \pm 1,19$ dan $17.16 \pm 1,28$, $26,20 \pm 1,11$, $24.60 \pm 1,08$, $39,78 \pm 1,19$. Analisis statistik menunjukkan terdapat perbedaan bermakna pada kadar indeks apoptosis antara kelompok K vs P1, P3 ($p = 0,001$), P1 vs P2 ($p = 0,001$), P1 vs P3 ($p = 0,035$), P2 vs P3 ($p = 0,001$), namun tidak bermakna antara kelompok K dan P2 (p=0,792) dan pada *Caspase-8* antara kelompok K vs P1, P3 ($p = 0,001$), K vs P2 ($p = 0,048$), P1 vs P2 ($p = 0,001$), P1 vs P3 ($p = 0,039$), P2 vs P3 ($p = 0,001$). Analisis korelasi antara indeks apoptosis dengan *Caspase-8* didapatkan korelasi bermakna ($p = 0,047$ dan r = 0,883).

Kesimpulan : *Artemisia vulgaris* dapat meningkatkan efektifitas kemoterapi Adriamycin-Cyclophosphamide pada mencit C3H dengan adenokarsinoma mammae dalam meningkatkan indeks apoptosis dan *Caspase-8*.

Kata kunci : Artemisia vulgaris, adenokarsinoma mammae, indeks apoptosis, *Caspase-8*.

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Abstract

Background : The incidence of breast cancer worldwide is still high. Surgery remains the top choice with other modalities of chemotherapy, radiation, and immunotherapy such as *Artemisia vulgaris (AV)*.

Aims : The study was aimed to demonstrate that administration of *AV* extract increased the levels of *apoptotic index* and *Caspase-8* in adenocarcinoma mammae.

Methods : This study used "Post test only control group design" on 24 females C3H mice that were randomly selected and divided into four groups : group K (control), P1 (chemotherapy), P2 (extract), and P3 (combination). Adenocarcinoma mammae comes from the inoculation of donor mice. Chemotherapy of Adriamycin 0,18 mg and Cyclophosphamide 1,8 mg were given in 2 cycles. *AV* 13 mg (0.2 ml) was given once daily orally. *Apoptotic index* and *Caspase-8* levels were evaluated by imunohistochemical staining.

Results : Mean of *apoptotic index* and *Caspase-8* levels were found in groups K, P1, P2, P3 were $2,18 \pm 0,80$, $18,00 \pm 1,58$, $3,34 \pm 0,51$, $20,32 \pm 1,39$ and $17.17 \pm 1,29$, $26,21 \pm 1,12$, $24.61 \pm 1,09$, $39,79 \pm 1,20$. The statistical analysis showed that there were significant differences in the levels of *apoptotic index* between groups of K vs P1, P3 ($p = 0,001$), P1 vs P2 ($p = 0,001$), P1 vs P3 ($p = 0,035$), P2 vs P3 ($p = 0,001$), and in *Caspase-8* between groups of K vs P1, P3 ($p = 0,001$), K vs P2 ($p = 0,048$), P1 vs P2 ($p = 0,001$), P1 vs P3 ($p = 0,039$), P2 vs P3 ($p = 0,001$). Correlation analysis between *apoptotic index* and *Caspase-8* showed significant correlation ($p = 0,047$ dan $r = 0,883$).

Conclusion : *Artemisia vulgaris* can improve the effectivity of Adriamycin-Cyclophosphamide chemotherapy on C3H mice with adenocarcinoma mammae in terms of elevated levels of *apoptotic index* and *Caspase-8*.

Keywords : Artemisia vulgaris, adenocarcinoma mammae, *apoptotic index*, *Caspase-8*.