ABSTRACT

Curcumin and pentagamavunon-0 (PGV-0) are potential candidates of chemopreventive agents, however curcumin and PGV-0 are poorly soluble in water so their bioavailibilities inside the body are low. The *Self Nano Emulsifying Drug Delivery Systems* (SNEDDS) formulation has been developed to increase solubility and bioavailibilty of curcumin and PGV-0. The purpose of this study was to investigate cytotoxic activity of SNEDDS curcumin and SNEDDS PGV-0 against 4T1 breast cancer cell and normal cell Vero.

Cytotoxic activity of SNEDDS curcumin and SNEDDS PGV-0 was tested using the MTT assay. $5x10^3$ 4T1 cells and $10x10^3$ Vero cells per well in a 96-*well plate* were treated with SNEDDS curcumin dan SNEDDS PGV-0 in a various concentrations. After 24 hours, MTT dan stopper reagent were added, and the absorbance was read using microplate reader at λ 595 nm. The test result was analyzed using Microsoft Excel 2010 to obtain the IC_{50} value.

The result of this study indicated that SNEDDS curcumin dan SNEDDS PGV-0 had cytotoxic activity against 4T1 cell with IC_{50} values respectively 5,48 ± 0,36 µg/mL and 5,36 ± 0,56 µg/mL, whereas in Vero cell the IC_{50} values obtained are respectively 4,40 ± 0,17 µg/mL and 7,50 ± 0,30 µg/mL. Test of significance was done with *paired T-test*, showing that the comparison of IC_{50} from SNEDDS curcumin and curcumin and IC_{50} from SNEDDS PGV-0 and PGV-0 are significantly different in 4T1 cell and in Vero cell. This result indicated that SNEDDS formulation gave influence in curcumin and PGV-0 cytotoxic activity.

Keywords: SNEEDS, Curcumin, PGV-0, 4T1.

INTISARI

Senyawa kurkumin dan pentagamavunon-0 (PGV-0) merupakan kandidat agen kemoprevensi yang potensial, namun keduanya sukar larut dalam air sehingga bioavailibilitasnya di dalam tubuh rendah. Formulasi *Self Nano Emulsifying Drug Delivery Systems* (SNEDDS) telah dikembangkan untuk meningkatkan kelarutan dan bioavalibilitas senyawa tersebut. Penelitian ini dilakukan untuk menguji aktivitas sitotoksik SNEDDS kurkumin dan SNEDDS PGV-0 terhadap sel kanker payudara 4T1 dan sel normal Vero.

Aktivitas sitotoksik SNEDDS kurkumin dan SNEDDS PGV-0 diuji dengan metode MTT *assay*. Sejumlah $5x10^3$ sel 4T1 per sumuran dan $10x10^3$ sel Vero per sumuran dalam 96-*well plate* diberi perlakuan SNEDDS kurkumin dan SNEDDS PGV-0 dengan berbagai seri konsentrasi. Setelah 24 jam, dilakukan penambahan reagen MTT dan *stopper*, dilanjutkan pembacaan absorbansi menggunakan *microplate reader* pada λ 595 nm. Hasil uji dianalisis dengan metode regresi linear menggunakan *software Microsoft Excel* 2010 untuk mendapatkan nilai IC_{50}.

Hasil penelitian menunjukkan bahwa SNEDDS kurkumin dan SNEDDS PGV-0 memiliki aktivitas sitotoksik pada sel 4T1 dengan nilai IC_{50} masing-masing 5,48 ± 0,36 µg/mL dan 5,36 ± 0,56 µg/mL, sedangkan pada sel Vero didapatkan nilai IC_{50} masing-masing 4,40 ± 0,17 µg/mL dan 7,50 ± 0,30 µg/mL. Hasil uji signifikansi menggunakan *paired T-test* menunjukkan nilai IC_{50} SNEDDS kurkumin dan kurkumin maupun SNEDDS PGV-0 dan PGV-0 yang berbeda signifikan pada sel 4T1 dan sel Vero, mengindikasikan bahwa formulasi SNEDDS memberikan pengaruh terhadap aktivitas kurkumin dan PGV-0 pada sel 4T1 dan sel Vero.

Kata kunci: SNEEDS, Kurkumin, PGV-0, 4T1.