ABSTRACT

The effort to heal colon cancer hasn't been able to provide effective results either with drugs or surgery and radiotherapy. Therefore, the development of anticancer agent should be done, one of them is curcumin and its analogues, pentagamavunon-0 (PGV-0) and pentagamavunon-1 (PGV-1). The curcumin and its analogues have been evaluated for their cytotoxic activity against several cancer cell lines such as T47D, MCF-7 and WiDr. This study aims to evaluate cytotoxic activity of curcumin, PGV-0, and PGV-1 on CT26 cells and Vero cells.

The cytotoxic activity of curcumin and its analogues was evaluated by cell incubation with series of compound concentration for 24 hours. Cell viability measurement was performed by MTT assay. The absorbance was read using *microplate reader* at λ 550 nm. Absorbance values was converted to percent of cell viability. IC_{50} value was analyzed by linear regression equation (concentration versus percent of cell viability). Then, SI value was determined from IC_{50} value on normal cells was divided by IC_{50} value on cancer cells.

Curcumin, PGV-0 and PGV-1 exhibited cytotoxic activity on CT26 cells wi th IC_{50} values of 93,14 μM, 73,37 μM and 47,65 μM, respectively. The IC_{50} values of curcumin, PGV-0 and PGV-1 on Vero cells is 91,78 μM, 221,02 μM and 676,09 μM. SI value of curcumin, PGV-0 and PGV-1 is 0,99; 3,01 and 14,19. Based on these finding studies, curcumin had high cytotoxic activity on Vero cells than on CT26 cells and it wasn't selective against cancer cells, whereas PGV-0 and PGV-1 had high cytotoxic activity on CT26 cells and low cytotoxic activity on Vero cells, and they were selective against cancer cells. The results above suggest that PGV-0 and PGV-1 are more potential to be developed as anticancer agent than curcumin, especially on colon cancer.

Keywords : *CT26, curcumin, PGV-0, PGV-1, cytotoxic*

INTISARI

Usaha penyembuhan kanker kolon belum mampu memberikan hasil yang efektif baik dengan obat-obatan kanker mau pun pembedahan kemoterapi dan radioterapi, maka dilakukan pengembangan obat antikanker salah satunya menggunakan kurkumin dan analognya yaitu pentagamavunon-0 (PGV-0) dan pentagamavunon-1 (PGV-1). kurkumin dan analognya tersebut telah diteliti memiliki aktivitas sitotoksik terhadap beberapa sel kanker seperti sel T47D, MCF-7 dan WiDr. Penelitian ini bertujuan untuk mengetahui aktivitas sitotoksik dari senyawa kurkumin, PGV-0, dan PGV-1 pada sel kanker CT26 dan sel normal Vero.

Uji aktivitas sitotoksik dilakukan dengan perlakuan inkubasi sel bersama suatu seri kadar senyawa uji selama 24 jam. Pengukuran viabilitas sel dilakukan dengan metode MTT. Hasil uji dibaca dengan *microplate reader* pada panjang gelombang 550 nm. Nilai absorbansi yang diperoleh dikonversi menjadi persen viabilitas sel. Nilai IC_{50} dihitung dari persamaan regresi linear kadar versus persen viabilitas sel. Kemudian dilakukan perhitungan nilai SI dengan cara nilai IC_{50} pada sel normal dibagi IC_{50} pada sel kanker.

Senyawa kurkumin, PGV-0 dan PGV-1 menunjukkan aktivitas sitotoksik pada sel CT26 dengan nilai IC_{50} masing-masing sebesar 93,14 µM, 73,37 µM dan 47,65 µM, sedangkan nilai IC_{50} kurkumin, PGV-0 dan PGV-1 pada sel Vero 91,78 µM, 221,02 µM dan 676,09 µM. Nilai SI kurkumin, PGV-0 dan PGV-1 yaitu 0,99; 3,01 dan 14,19. Berdasarkan hasil yang diperoleh, kurkumin memiliki aktivitas sitotoksik yang tinggi pada sel Vero dibandingkan pada sel CT26 dan tidak selektif terhadap sel kanker, PGV-0 dan PGV-1 memiliki aktivitas sitotoksik yang tinggi pada sel CT26 dan aktivitas sitotoksik yang rendah pada sel Vero, serta selektif pada sel kanker. Sehingga, PGV-0 dan PGV-1 lebih potensial untuk dikembangkan sebagai agen antikanker pada kanker kolon dibandingkan kurkumin.

Kata kunci : *CT26, kurkumin, PGV-0, PGV-1, sitotoksik*