Studi Pengaruh Minyak Biji Jojoba (Simmondsia chinensis (Link) Schneider) terhadap Viabilitas dan Ultrastruktur Sel Kanker Paru A549 = Study for Effects of Jojoba (Simmondsia chinensis (Link) Schneider) Seed Oil towards the Viability and Ultrastructure of Lung Cancer Cell A549

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Abstrak

Morbiditas dan mortalitas kanker paru yang tinggi serta tantangan kemoterapi (resistensi sel kanker dan efek samping serius) menimbulkan perlunya ekplorasi agen antikanker alami. Jojoba (Simmondsia chinensis (Link) Schneider) adalah salah satu tumbuhan yang menjadi sumber agen antikanker potensial. Ekstrak dan minyak biji jojoba telah dilaporkan memiliki efek sitotoksik terhadap viabilitas sel kanker kolorektal HCT-116, sel kanker payudara MCF-7, dan sel melanoma MV-3. Akan tetapi, pengaruh minyak biji jojoba terhadap viabilitas dan ultrastruktur sel kanker paru A549 belum diketahui sebelumnya. Maka dari itu, penelitian ini bertujuan untuk mengetahui pengaruh variasi konsentrasi minyak biji jojoba (50, 100, 200, 300, 400, dan 500¼g/mL) terhadap viabilitas sel A549 dengan metode Trypan Blue serta ultrastruktur sel A549 dengan metode Scanning Electron Microscopy. Hasil uji dan analisis statistik membuktikan bahwa minyak biji jojoba dengan konsentrasi 100, 200, 300, 400, dan 500 Î¼g/mL memiliki pengaruh yang signifikan terhadap penurunan viabilitas sel A549. Konsentrasi 300¼g/mL minyak biji jojoba mampu mengakibatkan perubahan ultrastruktur sel A549 berupa blebbing membran dan pemisahan sel dari jaringan di sekitarnya serta hilangnya sitoskeleton aktin. Analisis induksi apoptosis, potensi antikanker senyawa simmondsin murni, serta pengaruh secara in vivo perlu diuji untuk membuktikan potensi antikanker minyak biji jojoba terhadap kanker paru secara lebih lanjut.

.....The high morbidity and mortality rate of lung cancer and the challenges of chemotherapy (cancer cell resistance and serious side effects) have led to the urgency to explore natural anticancer agents. Jojoba (Simmondsia chinensis (Link) Schneider) is one of the plants that is known for its unique seed wax ester oil and has various potentials, one of which is anticancer. Jojoba seed oil and extracts has been reported to exert cytotoxic effects on the viability of HCT-116 colorectal cancer cells, MCF-7 breast cancer cells, and MV-3 melanoma cells. However, the effect of jojoba seed oil on the viability and ultrastructure of A549 lung cancer cells has not been previously determined. This study aims to determine the effect of various concentrations of jojoba seed oil (50, 100, 200, 300, 400, and 500 Î¼g/mL) on A549 cell viability by Trypan Blue method and ultrastructure by Scanning Electron Microscopy method. The test results and statistical analysis proved that jojoba seed oil with concentrations of 100, 200, 300, 400, and 500¼g/mL had a significant effect on reducing A549 cell viability. The jojoba seed oil concentration of 300¼g/mL can cause membrane blebbing, detachment from surrounding tissue, and loss of cytoskeleton on A549 cells. Analysis of apoptosis induction, anticancer potential of pure simmondsin compound, and in vivo effects need to be evaluated to further prove the anticancer potential of jojoba seed oil towards lung cancer.