ABSTRAK

Latar Belakang : Penurunan aktivitas hematopoietik akibat *reactive oxygen species* (ROS) pada penderita kanker kepala dan leher (KKL) dapat menyebabkan myelosupresi akibat efek samping *cisplatin*. Antioksidan eksternal, termasuk *astaxanthin*, diperlukan untuk menetralkan, melawan ROS serta mencegah penurunan aktivitas hematopoietik. Penelitian ini bertujuan untuk membuktikan *astaxanthin* dapat mencegah penurunan aktivitas hematopoietik melalui peningkatan *superoksida dismutase* (SOD) dan penurunan *malondialdehyde* (MDA) pada penderita KKL akibat *cisplatin*.
Metode : Desain penelitian adalah *double blind randomized controlled trial pre-and post-test design* dengan 42 subjek penelitian dibagi secara acak menjadi dua kelompok. Kelompok perlakuan diberikan *astaxanthin* 2x4 mg dan kelompok kontrol diberikan vitamin C 1x500 mg dan vitamin E 1x250 IU selama 21 hari. Analisis data dilakukan dengan uji Deskriptif, *Levene, Shapiro-Wilks, Paired Sample, Independent Sample, Wilcoxon* serta *Mann-Whitney.*
Hasil : Subjek penelitian 42 orang, rerata usia 48,2 tahun, laki-laki dan perempuan 2:1, kanker nasofaring 23 (54,8%) subjek, stadium IV 32 (76,2%) subjek, siklus IV 14 (33,3%) subjek, *Paxus-Cisplatin* sebanyak 24 (57,1%), Eastern Cooperative Oncological Group (ECOG) I 31 (73,8%) subjek dan Normal Indeks Massa Tubuh 31 (73,8%) subjek. Terdapat perbedaan bermakna delta penurunan hemoglobin (p=0,000), eritrosit (p=0,000), leukosit (p=0,008) dan MDA (p=0,000), sedangkan trombosit (p=0,571) dan SOD (p=0,443)) tidak berbeda bermakna.
Kesimpulan : Pemberian *astaxanthin* 2x4 mg selama 21 hari pada penderita KKL dapat mencegah penurunan kadar hemoglobin, jumlah eritrosit (*effect size* paling besar), leukosit serta meningkatkan SOD dan menurunkan MDA pada penderita KKL yang mendapat *cisplatin.*

Kata kunci : *astaxanthin*, aktivitas hematopoietik, KKL, *cisplatin*, ROS

ABSTRACT

Background : Patients with head and neck cancer (HNC) can experience decreased hematopoietic activity due to reactive oxygen species (ROS) caused by the side effects of cisplatin, which can lead to myelosuppression. External antioxidants, such as astaxanthin are required to neutralize ROS, and prevent a decrease in hematopoietic activity. This study aims to demonstrate the effectiveness of astaxanthin in preventing a decrease in hematopoietic activity by increasing superoxide dismutase (SOD), and decreasing malondialdehyde (MDA) levels in HNC patients undergoing cisplatin treatment.
Methods : The study employed a double-blind randomized controlled trial pre-and post-test design with 42 research subjects, randomly allocated into two groups. The treatment group received astaxanthin 2x4 mg, while the control group was given vitamin C 1x500 mg, and vitamin E 1x250 IU for 21 days. Data analysis utilized Descriptive, Levene, Shapiro-Wilks, Paired Sample, Wilcoxon, Independent Sample, and Mann-Whitney tests.
Results : The study subjects had a mean age of 48.2 years, with a male to female ratio of 2:1. The majority had nasopharyngeal cancer (54.8%), stage IV cancer (76.2%), and were in cycle IV (33.3%) receiving Paxus-Cisplatin (57.1%). Additionally, 73.8% had an Eastern Cooperative Oncological Group (ECOG) score of I, and a Normal Body Mass Index (BMI). The study found significant differences in the decrease in hemoglobin (p=0.000), erythrocyte count (p=0.000), leukocyte count (p=0.008), and MDA levels (p=0.000). However, there were no significant differences in thrombocyte count (p=0.571) or SOD levels (p=0.443).
Conclusion : Supplementation with astaxanthin 2x4 mg for 21 days in HNC patients receiving cisplatin can prevent a decrease in hemoglobin, erythrocyte count (with the largest effect size), and leukocyte count, while also increasing SOD levels, and reducing MDA levels.

Keywords : astaxanthin, hematopoietic activity, HNC, cisplatin, ROS