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ABSTRACT

Correlation between Omega-3 Fatty Acids Plasma Levels with Muscle Mass and Handgrip-Muscle Strength in Head Neck Cancer Patients undergoing Radiotherapy in Ciptomangunkusumo Hospital, Jakarta

Elfina Rachmi,[1] Inge Permadhi,[1] Angela Giselvania[2]

1. *Department of Nutrition, Faculty of Medicine, Universitas Indonesia, Cipto Mangunkusumo Hospital, Jakarta, Indonesia*
2. *Department of Radiotherapy, Faculty of Medicine, Universitas Indonesia, Cipto Mangunkusumo Hospital, Jakarta, Indonesia*

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Background: Cancer cachexia is common in head neck cancer caused by increasing pro-inflammatory cytokines, has effect on hypermetabolism, increased nutritional needs, anorexia, decreased muscle mass and body weight. Omega-3 fatty acids play a role in reducing inflammation, improving muscle mass and handgrip.
Objective: This cross sectional study, conducted in Department of Radiotherapy Dr. CiptoMangunkusumo Hospital, aimed to investigate correlation between omega-3 fatty acids plasma with muscle mass and hand grip-muscle strength in head neck cancer subjects undergoing radiotherapy.
Methods: This study was conducted from June to August 2016. The subjects were head neck cancer patients in stage I–IV (18–65 years old) and had received >25 times radiation, and obtained by consecutive sampling method. Total omega-3 fatty acids intake was obtained by semi quantitative Food Frequency Questionnaire. Anthropometric measurements used ShorrBoard and Smic® ZT-120, muscle mass used Omron HBF375®, and handgrip used Jamar® dynamometer. Omega-3 fatty acids plasma were examined by gas chromatography flame ionized detector. Correlation omega-3 fatty acids plasma with muscle mass were analyzed by Pearson, and correlation with handgrip by Spearman.
Results: There were 52 subjects completed all examinations, received radiotherapy ≥25 times combined with chemotherapy, 57% male, 50 years old. Most sites at nasopharynx, mostly stage IV, 25% subjects had normal body mass index, 75% were low. Most subjects had nutritional problems caused by inadequate intake of energy, protein, fat, and omega-3 fatty acids. Majority (75%) had small muscle mass (28.4±4.7%), mostly (75%) normal handgrip, median 37.1(25.7–68.5) kg, and all subjects had very low omega-3 fatty acids plasma (2.5±0.8%). There was strong correlation between omega-3 fatty acids plasma with muscle mass ($r = 0.6$, $p < 0.05$) and handgrip ($r = 0.8$, $p < 0.001$) who received radiotherapy (>60–70 Gy), no correlation less than those doses.
Conclusion: There was correlation between omega-3 fatty acids plasma with muscle mass and handgrip, at radiotherapy doses >60–70 Gy.

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Keywords: head neck cancer, radiotherapy, omega-3 fatty acids, muscle mass, handgrip

Corresponding author:
Elfina Rachmi
Department of Nutrition Faculty of Medicine
Universitas Indonesia
Jalan Salemba Raya No. 6, Jakarta Pusat, Indonesia
Telephone: +62-21 31930205, +62-21 3913932
Email: ingepermadhi@yahoo.com