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Abstract

Association of Omega-3 Index and Blood Cell Count-Derived Systemic Inflammatory Indexes among Testicular Germ Cell Tumor Survivors †

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Abstract: Background and objectives: Although testicular cancer is considered the paradigm of highly curable malignancy, treatment-induced adverse effects and potential impairment of gonadal function may cause non-negligible long-term health repercussions, including metabolic disturbances and cardiovascular sequelae. This observational, cross-sectional study recruited a sample of testicular germ cell tumor survivors (TGCTSs) attending routine follow-up care, with the aim to investigate the relationship between the Omega-3 Index, a promising cardiometabolic risk-assessment biomarker, and complete blood cell (CBC) count-derived systemic inflammation indexes. Methods: Erythrocyte membrane fatty acid (FA) profiling was performed by gas chromatography with flame ionization detection. The Omega-3 index (OI3) was computed by summarizing eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) expressed as a percentage of total FAs. Inflammatory indexes, including NLR (neutrophil-to-lymphocyte ratio), SII (systemic immune-inflammation index (platelet count × NLR)), SIRI (systemic inflammatory response index (monocyte count × NLR)), and AISI (aggregate index of systemic inflammation (monocyte count × SII)) were determined using routinely obtained hematological parameters. Results: In the analyzed cohort (n = 92, age $\bar{x}$ = 35.89 ± 8.67 years), the mean value of O3I was 4.41 ± 0.92%, where 53.26% of men were allocated the high-risk group (O3I < 4%) and the rest were in the moderate cardiovascular hazard category (4% ≤ O3I < 8%). The O3I correlated inversely with the NLR, SII, and AISI (r = −0.234, −0.241, and −0.249, respectively, all $p < 0.01$). A negative association was determined between the total content of polyunsaturated fatty acids and SIRI (r = −0.221, $p < 0.05$). The NLR and AISI were statistically significantly lower in the subgroup of patients with O3I ≥ 4% ($p < 0.05$). Discussion: Blood cell count-based inflammatory indexes may contribute to a more efficient risk stratification of TGCTS in relation to cardiometabolic disorders. Further large-scale research and long-term intervention trials are warranted to investigate the clinical significance of an increased intake of anti-inflammatory long-chain omega-3 polyunsaturated FA via dietary sources and/or supplementation in modulating the inflammatory process and reducing the morbidity burden in this patient population.

Keywords: testicular germ cell tumor; Omega-3 Index; systemic inflammatory indexes

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Data Availability Statement: The data supporting reported results can be found upon request in the form of datasets available at the Center of Research Excellence in Nutrition and Metabolism, Institute for Medical Research, National, Institute of Republic of Serbia, University of Belgrade and Clinic of Urology, University Clinical Centre of Serbia.

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