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Relationship between sarcopenia and anthracycline related cardiotoxicity in patients with cancer

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Background

sarcopenia is associated with poor prognosis and increased treatment toxicity in patients with cancer. However, there is limited data about sarcopenia and cardiotoxicity of chemotherapy. The aim of this study is to evaluate relationship between sarcopenia and anthracycline (AC) related cardiotoxicity.

Methods

Patients who received AC-based chemotherapy between 2014-2018, and had baseline abdominal CT containing both L3-L4 levels for measuring skeletal muscle index (L3-L4 SMI) and psoas muscle index (PMI), and baseline and follow-up echocardiography after AC treatment were included. Sex-specific cutoffs for L3 SMI, L4 SMI and PMI were used for diagnosis of sarcopenia. Cardiotoxicity was defined as development of either systolic dysfunction according to European society of Cardiology (ESC) ejection fraction (EF) criteria, or diastolic dysfunction according to American Society of Echocardiography (ASE) diastolic dysfunction criteria. Multivariate analysis was performed to determine potential predictors of cardiotoxicity.

Results

A total of 166 patients (75 male, 91 female) were included; 50 (30.1 %) with breast cancer, 82 (49.4 %) with lymphoma, 11 (6.6 %) with sarcoma and 23 (13.9%) with other cancers. Median age was 48 years and median doxorubicin dose was 238 mg/m². Sarcopenia was determined in 33 (19.9 %) according to L3 SMI, in 17 (10.2 %) according to L4 SMI and in 45 (27.1 %) according to PMI. After AC treatment, 27 patients (16.3 %) developed cardiotoxicity; 17 (10.2 %) had systolic dysfunction, 9 (5.4%) had diastolic dysfunction and 1 (0.6 %) had both. After adjustment for age, gender, doxorubicin dose, body mass index, and presence of cardiovascular disease; sarcopenia at any of the three levels was significantly associated with increased risk of cardiotoxicity. (L3 SMI Hazard ratio [HR]= 4.14, 95% confidence interval [CI] 1.66-10.31, p=0.002; L4 SMI HR= 3.65, 95% CI 1.21-11.0, p=0.022; PMI HR= 4.39, 95% CI 1.81-10.65, p=0.001).

Conclusions

This is the first study demonstrating a significant association between CT-based diagnosis of sarcopenia and anthracycline-related cardiotoxicity. Routine CT scans may help clinicians identify high risk patients in whom closer follow-up or cardioprotective measures should be considered.

Legal entity responsible for the study

The authors.

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Disclosure

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