

Is cardiac wasting accompanied by skeletal muscle loss in breast cancer patients receiving anticancer treatment?

We have read with great interest the article by Klassen *et al.*, which demonstrated that muscle strength was significantly decreased in breast cancer patients receiving anticancer treatment, compared with healthy subjects.¹

In addition to impaired muscle strength, chemotherapy-induced cardiomyopathy has drawn much attention in this field.¹ Intriguingly, some patients have shown dose-independent reversible cardiomyopathy, but others have displayed a dose-dependent irreversible one, which are typically caused by trastuzumab and anthracyclines, respectively.² As yet, it remains unclear whether muscle strength is associated with cardiac function in patients with breast cancer and whether chemotherapy-induced muscle wasting is reversible and/or dose-dependent. In predicting and diagnosing of cardiac dysfunction, biomarkers such as B-type natriuretic peptide and cardiac troponin have shown promising results as well as echocardiography. Namely, elevated B-type natriuretic peptide and increased cardiac troponin were associated with subsequent left ventricular dysfunction and cardiovascular events, respectively,^{3,4} and abnormal strain imaging in echocardiography is currently the strongest predictor of cardiotoxicity.⁵ On the other hand, no biomarker has been developed for the prediction and diagnosis of muscle wasting, despite extensive research.^{6–8} Furthermore, conventional medical therapy for heart failure such as beta-blockers and angiotensin-converting-enzyme inhibitors (ACEi) had favourable effects on anthracycline-induced cardiomyopathy,^{9,10} while there might be no established treatment for muscle wasting, with the exception of exercise training.^{11–13} It is still under debate whether ACEi have protective effects on muscle wasting, although ACEi

failed to prevent sarcopenia in older subjects.¹⁴ It seems important to focus on the similarities and differences between cardiac dysfunction and impaired muscle strength in patients with breast cancer.

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