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Sarcopenia in Cancer Patients

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Editorial

Skeletal muscle consists of 40%-50% of total body mass in healthy humans [1]. Commonly skeletal muscle function is performing muscular contractions that make physical activities of daily living and exercise could be done. Skeletal muscle also had a role as an essential regulator of metabolic and inflammatory homeostasis [2].

Emerging evidence shows that decreased muscle mass known as sarcopenia is a prevalent condition in cancer patients regardless of disease stage and nutritional status and is associated with higher mortality in cancer patients [3-6]. The reports of skeletal muscle as a prognostic factor emphasize the need of better understanding of the best tools to diagnosis sarcopenia in cancer patients. The challenge in clinical practice will be in the assessment of sarcopenia to identify those who might benefit most from if cancer patients given interventions. Here, we review the current evidence evaluating diagnostic tools to diagnosis sarcopenia in cancer patients.

Sarcopenia is defined as a decrease of skeletal muscle mass (SMI) and function [7]. It is usually associated with frailty syndrome, physical inactivity, decreased mobility, slow gait, and poor physical endurance [8]. The exertion of muscle contraction is measured as muscle strength. Muscles are composed of individual muscle fibers, which are characterized by their size, twitch velocity and metabolic phenotype. All anatomic features play a central role for regulation of muscle contraction and muscle metabolism. In cancer patient there is muscle dysfunction as any measureable impairment in muscle strength or muscle composition independent of the underlying cause [2,8].

Prevalence of sarcopenia in advanced cancer patients was found to vary among various types of cancer, stage of disease, and also depends on the tools measuring it. In Early stage cancer who underwent curative surgery in the study of Breast cancer survivor, the HEAL study, sarcopenia measured using DXA scan. The prevalence was 16% from 471 patients [6]. In hepatocellular carcinoma patients underwent curative hepatectomy, 40.3% of 186 patients were classified as sarcopenia by using CT scan [9].

Sarcopenia is a strong independent predictor of all-cause, CVD- and cancer mortality, morbidity and QoL in non-cancer groups [10]. The Importance of sarcopenia as predictor of prognosis was reported in patients with early stage breast cancer. Survivors diagnosed with sarcopenia, assessed on average 12 months after diagnosis, had almost three-fold higher all-cause mortality rate (HR = 2,86) compared with non-sarcopenic survivors [6]. Sarcopenia is associated with poorer prognosis in patients with advanced cancer of breast cancer. Study conducted by Prado found that patients with metastatic breast cancer had shorter time-to-tumor progression (101 days) relative to non-sarcopenic patients (173 days) [11].

There were significant associations between muscle function and treatment complications are recently emerged from recent studies. In advanced breast cancer patients treated with capecitabine, 50% of patients presenting with sarcopenia experienced dose limiting toxicity, compared with 19,5% of non-sarcopenic patients [11]. Following hepatic resection of colorectal metastasis, sarcopenia was associated with increased risk of major postsurgical complications [12]. Sarcopenia patients also increased risk of low handgrip strength predicted longer hospital stay in patients undergoing esophagectomy for esophageal cancer [13].

Reports have found associations between muscle function and patient reported outcomes in particular fatigue in early- and advanced stage cancer patients. In breast cancer survivors evaluated after adjuvant treatment, handgrip strength was associated with several patient-reported outcomes including fatigue, pain and QoL [14]. Kilgour et al found several measures of muscle function; handgrip strength, quadriceps strength and skeletal muscle index correlated with fatigue in advanced stage cancer patients [15].

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Contractile muscle function can be measured by isometric or isokinetic force/torque or more pragmatic methods including repetition maximum (RM) tests or handgrip strength. Whole-body muscle mass can be measured by body composition assessments including dual-energy X-Ray absorptiometry (DXA) scans or volume is measured via cross-sectional area (CSA) assessments by imaging modalities, for example computerized topography (CT), magnetic resonance imaging (MRI) or ultrasonography. For assessment of cellular muscle structure, muscle tissue biopsy is a valuable method allowing for detailed assessment of muscle fiber morphology, biochemical indices and gene expression profiles [8].

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