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Letter to Editor

Phase Angle as a Marker of Sarcopenia and Frailty in Hospitalized Older Adults: Clinical Promise and Research Needs

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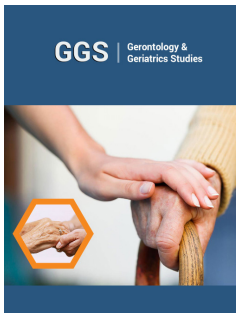

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Introduction

The article written by Pereira and colleagues [1], "Phase Angle as a Marker for Sarcopenia and Frailty in Hospitalized Older Adults," thus makes an important and timely contribution to geriatric medicine. According to the authors, Phase Angle (PhA) is derived from Bioelectrical Impedance Analysis (BIA) and could possibly constitute a useful, non-invasive biomarker for the identification of sarcopenia and frailty. With the acceleration of global demographic transition into older populations, the period of greatest urgency surrounds the search for simple and dependable screening tools for geriatric syndromes. Sarcopenia and frailty are clearly among the most common, definitively debilitating conditions associated with aging. Sarcopenia is defined as the progressive loss of muscle mass and strength and physical performance, according to the latest European Working Group on Sarcopenia in Older People or EWGSOP2 guidelines, while frailty is treated as some version of multidimensional syndrome, stressor susceptibility, accompanying fall incidents, reduced ability to perform activities of daily living, increased hospitalization and eventually death. Traditional metrics used for diagnosing conditions in the patient population have included muscle strength of handgrip, gait speed and imaging, which many bedridden or severely ill patients cannot be subjected to. Hence, the opportunity for the Application of PhA as a method that is quick and reproducible and comfortable for bedside evaluations of health and muscle integrity. And as they sit down for their cross-sectional study on patients aged 60 and older hospitalized, the following are survey results by Pereira et al [1]. 37.7% for sarcopenia, 67% for frailty and 56.3% for low PhA (≤4.1°). Reduced PhA was significantly associated as an independent prognostic factor of sarcopenia (adjusted OR 2.7; 95% CI 1.2-5.8) and frailty (adjusted OR 2.4; 95% CI 1.1-5.2). Patients with severely decreased levels of sarcopenia and with frailty had much lower values of PhA, indicating that high PhA could actually identify and reflect the severity of such syndromes.

Even your figures could be distorted in human terms. The survey done by Pereira et al [1]. included patients aged 60 years and above within the cross-sectional study of hospital inpatients. It found the prevalence of sarcopenia to be 37.7%, frailty 67% and low PhA (≤ 4.1°) 56.3%. Of course, reduced PhA was independently associated with sarcopenia (adjusted OR 2.7; 95% CI 1.2-5.8) and frailty (adjusted OR 2.4; 95% CI 1.1-5.2). Patients with severe sarcopenia and frailty had much lower PhA values, implying that PhA could help identify and reflect on the severity of these syndromes. When reporting within a cross-sectional study of 60-year-old or older hospitalized patients, Pereira et al [1]. found that 37.7% sarcopenic, 67% frail, with low PhA (≤4.1°) approximately 56.3%. More importantly, reduced PhA was found to be independently associated with sarcopenia (adjusted OR 2.7; 95% CI 1.2-5.8) and with frailty (adjusted OR 2.4; 95% CI 1.1-5.2). PhA values of patients with severe sarcopenia and frailty

were measurably further down than average values, suggesting that PhA could identify and reflect the severity of these syndromes. Moreover, PhA was low also with people losing weight without wanting to, little muscle mass and poor nutrition, except that the last one was not significant after adjustments. All these imply that PhA tests for not-measured nutritional deficits but increases in physiological and cellular decline." The pragmatic consequences of these outcomes are immense. Older hospitalized individuals usually possess incomplete mobility, numerous comorbidities and a high risk of all elder syndromes. Some individuals may not be able to undergo normal diagnostics, such as measuring the gait speed or measuring handgrip strength. The development of offering a simple alternative, therefore, is expected to lessen this population's underdiagnosis and allow for earlier intervention. The findings are, in fact, consistent with past studies. For example, Kilic et al. [2] demonstrated that patients with sarcopenia were four times more likely to reveal reduced PhA, while Wilhelm-Leen et al. [3] indicated that PhA independently predicted frailty and mortality. More recently, Akamatsu et al. [4] confirmed PhA played a role in muscle quality reflection and Kwon et al. [5] found PhA predicted mortality in very elderly populations. All this together builds a great case for the clinical relevance of PhA across various populations and contexts. Nutritional vulnerability emerged as another important finding. Pereira et al. [1] reported that almost two-thirds of their cohort were malnourished or at risk of malnutrition. Unadjusted analyses revealed adverse associations with low PhA values, which were fully explained after adjusting for confounders. Regardless, study shows that PhA remains sensitive to nutritional status, fluid status, cachexia and oxidative stress. It thus serves to index muscle quality and systemic health; its multidimensionality makes it all the more appealing as a biomarker in geriatric medicine.

However, several caveats are acknowledged. The research carried out in one hospital in Brazil could never be generalized beyond this setting. The study was observational and restricted because a cross-sectional design does not allow inference of causality, nor does it show whether low PhA is a precursor or consequence of sarcopenia and frailty. The main limiting aspect of the research is that there are no international standards to set a cutoff for clinical applicability at both pre-and post-operative times. Previous studies have reported thresholds that ranged from 4° to 5°, with differences due to study populations, devices, or methodologies. Hence, PhA interpretation in the clinical context is inconsistent without consensus. It is indeed an important methodological gap that would affect broader implementation. The PhA offers perspectives not only in diagnosis but also in prognosis and monitoring. Reduced PhAs have been associated with an increased risk of falls, disability, postoperative complications and mortality. Furthermore, it may constitute a marker responsive to detecting the intervention. Resistance training, protein supplementation and multicomponent rehabilitation are increasingly considered interventions for sarcopenia and frailty. If validated in longitudinal studies, then PhA would become a parameter by which cellular and muscle integrity improvements can be monitored, affording clinicians an objective parameter to evaluate measures of therapeutic efficacy. Future research should be geared toward multicenter and/or longitudinal studies so that the PhA methodology may be assessed in diverse populations and different health care systems across the globe. Future investigations are needed to specify how measurements can become standardized, so an adjustment of prevalence cut-off points may be applied. Composite scores combining PhA and other markers-e.g., inflammatory markers, albumin levels, or vitamin D-could be great in terms of prediction. The development of an entirely new system and network that allows for the integration of BIA with electronic health records can potentially increase access to geriatric screening, especially in resource-limited communities. Rather than using PhA as a stand-alone diagnostic tool, these innovative, convenient ideas could open up further areas for PhA to be an integral part of a comprehensive geriatric assessment framework. In conclusion, Pereira et al. [1] have convincingly proved that Phase Angle serves as a marker for sarcopenia and frailty among the hospitalized elderly. Although further validation will be required, PhA appears to provide a simple, inexpensive means by which to clinically identify higher-risk patients. Thus, PhA should be incorporated into assessment methodologies for geriatric patients to facilitate the early diagnosis, timely intervention and optimization of outcomes for one of the most vulnerable population groups in medical care. The acceleration of global aging will necessitate simple, reproducible and prognostically useful instruments like PhA for any challenge in geriatric fast-track care [6-10].

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