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Diabetes & Obesity International Journal
ISSN: 2574-7770

A Look at the Phase Angle Obtained by Electrical Bioimpedance

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Editorial
Volume 9 Issue 2
Received Date: August 08, 2024
Published Date: August 28, 2024
DOI: 10.23880/doij-16000295

Editorial

Electrical bioimpedance analysis is an easy, non-invasive and non-ionizing method, used for various purposes, including: analysis of body composition, malnutrition, sarcopenia, general health status and can enable the identification of conditions associated with diseases. One of the parameters derived from electrical bioimpedance is the phase angle, a physiological index that represents the relationship between the resistance (capacitance of body fluids and electrolytes against the electrical current) and the reactance (capacity of the cell membrane to maintain electrical potential) of cells and body tissues [1,2].

The phase angle is considered an indicator of cellular health, low phase angle values are associated with dysregulation of cell permeability and cell death, on the other hand, high phase angle values reflect good cell membrane architecture and good homeostatic balance. The phase angle measurement can be performed once, where, through the bioelectrical impedance, the equipment emits a low-intensity electrical current (800μA – 50 kHz). The phase angle (PhA) can be obtained using the formula: PhA (°)= artan (reactance / resistance) x (180° / π) [3-5].

The phase angle is widely used in the health field, as its assessment can be associated with health conditions and tissue modification, as seen in muscle tissue, which has properties that make it an efficient bioelectrical conductor for the body. Which, when presenting levels of muscular hypertrophy, also presents changes in intracellular components, which leads to changes in phase angle values [6,7].

Phase angle is a variable sensitive to clinical conditions that influence cellular health. Changes and decreases in phase angle values are observed in people with malnutrition, diabetes mellitus, heart failure, cancer, sarcopenia, frailty and other clinical conditions [8-11]. Such clinical conditions, which cause a decrease in phase angle levels, arouse interest in investigating the multivariate association of phase angle and health/disease factors.

Therefore, the phase angle presents itself as an important variable to be used in the health field, whether for investigations of health status, performance, body composition, nutrition, as well as investigations in the clinical field, for disease relationships on the cellular state, the phase angle itself and other physiological markers.

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