Safety and Results of Bioelectrical Impedance Analysis in Patients with Cardiac Implantable Electronic Devices

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Abstract

Objective: To analyze the dual interference between cardiac implantable electronic devices (CIEDs) and bioelectrical impedance analysis (BIA).

Methods: Forty-three individuals admitted for CIEDs implantation were submitted to a tetrapolar BIA with an alternating current at 800 microA and 50 kHz frequency before and after the devices’ implantation. During BIA assessment, continuous telemetry was maintained between the device programmer and the CIEDs in order to look for evidence of possible electric interference in the intracavitary signal of the device.

Results: BIA in patients with CIEDs was safe and not associated with any device malfunction or electrical interference in the intracardiac electrogram of any electrode. After the implantation of the devices, there were significant reductions in BIA measurements of resistance, reactance, and measurements adjusted for height resistance and reactance, reflecting an increase (+1 kg; *P*<0.05) in results of total body water and extracellular water in liter and, consequently, increases in fat-free mass (FFM) and extracellular mass in kg. Because of changes in the hydration status and FFM values, without changes in weight, fat mass was significantly lower (-1.2 kg; *P*<0.05).

Conclusion: BIA assessment in patients with CIEDs was safe and not associated with any device malfunction. The differences in BIA parameters might have occurred because of modifications on the patients’ body composition, associated to their hydration status, and not to the CIEDs.