ACCURACY OF MULTI-FREQUENCY BIOELECTRICAL IMPEDANCE ANALYSIS AND BIOIMPEDANCE SPECTROSCOPY FOR MONITORING FLUID DISTRIBUTION CHANGES IN WOMEN AFTER GASTRIC BYPASS SURGERY

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RESEARCH OUTCOME:
As obesity and bariatric surgery become increasingly common, there is a growing need for a convenient body composition assessment tool that is accurate in extremely obese individuals. Obese individuals experiencing rapid weight loss after surgery can experience disproportionate losses of intracellular water (ICW), or body cell mass. The purpose of this research was to enhance patient care by evaluating the accuracy of two techniques to monitor changes in fluid distribution after gastric bypass surgery.

METHODS:
Fourteen extremely obese women (body mass index: 49.8 ± 6.3 kg/m²; age: 48 ± 10 years) were assessed for fluid distribution before gastric bypass surgery (T1), and approximately 1-week (T2) and 6-weeks (T3) postoperatively by multifrequency bioelectrical impedance analysis (MF-BIA; QuadScan 4000, Bodystat, Isle of Man, UK), bioimpedance spectroscopy (BIS; Hydra 4200, Xitron Technologies, San Diego, CA), and the combination of deuterium and bromide dilution.

RESULTS:
Dilution-measured ICW decreased from T1 to T2 (P=.019) and T1 to T3 (P=.002). Both MF-BIA and BIS accurately detected ICW change, compared to dilution, from T1 to T2 (MF-BIA: P=.231; BIS: P=.740) and from T1 to T3 (MF-BIA: P=.256; BIS: P=.810). The dilution-measured ECW: ICW ratio increased from T1 to T2 (P=.029) and from T1 to T3 (P=.003); only the BIS device accurately detected these changes.

CONCLUSIONS:
From these preliminary analyses, MF-BIA and BIS hold promise as convenient field techniques for assessing fluid changes in extremely obese women during rapid weight loss.