Evaluation of bioelectrical impedance testing in hospital in-patients

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Introduction

• Assessment of nutritional status in the clinical setting is difficult and often poorly achieved.
• Evidence for malnutrition in hospital is clear, with one study showing that 4 out of 5 patients were unable to meet their nutritional demands [1].
• Bioelectrical impedance analysis (BIA)-derived phase angle (PA) is a simple and non-invasive tool which refines the determination of nutritional status, reflects body cell health, and has prognostic value.
• However, BIA is not much used in clinical practice because of protocols which oblige the patient to be starved and on bed-rest.
• The research underpinning these protocols is dated and has probable user variability with the BIA machine.

Methodology

• BIA measurements using Bodystat Quadscan 4000 were taken on 50 hospital in-patients who were starved and rested. It was then repeated on two occasions: following controlled exercise and after eating breakfast.

Inclusion Criteria - Adult in-patients with capacity to consent.

Exclusion Criteria - Any unstable patients, Patients who were pregnant or breastfeeding, Age <18 years, Those who were unavailable for the study morning, nil by mouth, Patients in whom bioelectrical impedance testing would be impossible or uninterpretable (e.g. bilateral amputees).
• Data was analysed on STATA.

Aim

To determine whether eating and exercise affect BIA-derived Phase Angle.

Results

• PA results were typical of a hospital patient cohort.
• Results were collected over a 25 week period by the research team.
• Male (31, 62%) Female (19, 38%) age range 18-86 years, all acute medical admissions.
• Data was parametric and analysed using paired t tests.
• Neither exercise nor eating made a statistically nor clinically significant difference to the PA.

<table>
<thead>
<tr>
<th>Mean Phase Angle</th>
<th>P values</th>
</tr>
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<tbody>
<tr>
<td>Pre food and exercise</td>
<td>4.872</td>
</tr>
<tr>
<td>Post exercise</td>
<td>4.834 (p = 0.5593)</td>
</tr>
<tr>
<td>Post food</td>
<td>4.848 (p = 0.7739)</td>
</tr>
</tbody>
</table>

Conclusions

• In summary, the current protocols of starving and resting patients appear unnecessary and outdated.
• It is probable that PA measurement is a practical means to improve assessment of nutritional status in hospitalised patients.
• Limitations include a small sample size (feasibility study) and 3 clinical researchers resulting in probable user variability with the BIA machine.

Future Research:

• On initial submission of the abstract only 17 patients were recruited, this poster presents a more complete data set of 50 patients.
• Comparisons with other methods of nutritional assessment such as biochemical markers and anthropometric measurements will be analysed.

References:


Acknowledgments:

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