Hand grip strength alone is not an accurate indicator of malnutrition in older patients before, during or after admission to surgical wards

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Rationale
Hand grip strength (HGS) has been proposed as a surrogate measure of nutritional status that may be more sensitive to changes in muscle function secondary to declining nutritional status than muscle mass or other body composition measures. In combination with other characteristics, HGS is recommended by the American Society for Parenteral and Enteral Nutrition and the Academy of Nutrition and Dietetics in identifying adult malnutrition.

Aim
This study aimed to determine the accuracy of HGS as an indicator of malnutrition at different time points in an older (≥65 years) population.

Methods
Patients ≥65 years were recruited from the surgical pre-admission clinics and two general surgical wards at a large tertiary teaching hospital. Measures were undertaken at the pre-admission appointment, during acute admission (day 4-6), and/or at post-discharge follow-up appointment. HGS was measured using a single Jamshidi hydraulic hand dynamometer following the standardised positioning and instruction prescribed by the American Society of Hand Therapists, and recorded as the mean of 3 trials. Impaired HGS was defined as a value below the lower limit of the 95% CI of the mean from age, gender- and side-specific normative data.¹,²

Nutritional status was assessed by a trained diettian using the Patient-Generated Subjective Global Assessment (PG-SGA), with malnutrition defined as a global rating of SGA-B or -C. Dichotomised HGS and PG-SGA measures were used to determine diagnostic accuracy. Mean HGS of malnourished and not malnourished patients was compared at each time point by independent samples t-test, with standardised HGS calculated by converting observed HGS to a percentile of the lower limit of the 95% CI of the mean.

Results
A total of 99 patients (mean age 73.5 (SD 6.4) years, 60% male) were recruited, corresponding to 30 pre-admission, 74 acute and 36 post-discharge measures. Impaired HGS was not able to accurately identify malnutrition in pre-admission, acute or post-discharge patients (Table 1). When mean standardised HGS was compared between malnourished and not malnourished groups, a difference was observed at post-discharge follow-up only (96.0% (SD 8.6%) vs 108.2% (SD 20.7%), p = 0.017).

Table 1: Ability of hand grip strength to predict malnutrition as measured by the Patient-Generated Subjective Global Assessment

<table>
<thead>
<tr>
<th>Time-point</th>
<th>Pre-discharge</th>
<th>Acute</th>
<th>Post-discharge</th>
<th>AUC</th>
<th>Test interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-discharge</td>
<td>68% (64-72%)</td>
<td>68% (63-73%)</td>
<td>68% (63-73%)</td>
<td>(63-73%)</td>
<td>0.760</td>
</tr>
<tr>
<td>Acute</td>
<td>50% (38-62%)</td>
<td>68% (63-73%)</td>
<td>50% (38-62%)</td>
<td>68% (63-73%)</td>
<td>0.604</td>
</tr>
<tr>
<td>Post-discharge</td>
<td>50% (38-62%)</td>
<td>50% (38-62%)</td>
<td>50% (38-62%)</td>
<td>50% (38-62%)</td>
<td>0.392</td>
</tr>
</tbody>
</table>

Conclusion
As a standalone measure, HGS was not found to be a suitable surrogate measure of nutritional status before, during or after admission to surgical wards in an older population. As such, assessment of nutritional status via validated tools by an appropriately trained clinician remains the preferred method.

Acknowledgements
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References