Diagnosis of malnutrition in patients with intestinal insufficiency or failure using GLIM-criteria

PD-005

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Background

Patients with intestinal insufficiency or intestinal failure are prone to develop malnutrition due to malabsorption of micro- and macronutrients and it is crucial to diagnose the condition in order to provide targeted nutritional therapy. However, there is a lack of global consensus in diagnosing mal-nutrition, which lead The Global Leadership Initiative on Malnutrition (GLIM) to suggest the GLIM-criteria, based on etiological and phenotypical criteria[1] (Figure 1).

Figure 1: GLIM diagnostic scheme for screening, assessment, diagnosis and grading of malnutrition[1]

Risk screening	At risk for malnutrition ▪ Use validated screening tools.
Diagnostic assessment	Assessment criteria Phenotypic ▪ Non-volitional weight loss. ▪ Low BMI ▪ Reduced muscle mass. Etiologic ▪ Reduced food intake or assimilation. ▪ Disease burden/ Inflammatory condition.
Diagnosis	Meets criteria for malnutrition diagnosis ▪ Requires at least 1 phenotypic criterion and 1 etiologic criterion
Severity grading	Determine severity of malnutrition ▪ Severity determined based on phenotypic criterion

Aim

The aim of this study was to investigate the frequency and severity of malnutrition in patients with intestinal insufficiency (INS) or failure (IF) and to validate GLIM-criteria.

Methods

A cross-sectional study comprising metabolically stable INS patients on enteral nutrition and IF patients on home parenteral nutrition.

The following data were included:

Patients characteristics	
▪ Age, gender, body mass index	
Diagnostic assessments	
Phenotypic	**Etiologic**
▪ Body mass Index (BMI) ▪ Handgrip strength (HGS), *Hand dynamometer,* *(NC-70124 by NorthCoast)* ▪ Fat free mass index (FFMI), *Bioelectrical impedance analysis,* *(BioScan 920-II from Maltron,UK)*	▪ Albumin (p-alb) ▪ C-reactive protein (p-CRP). ▪ Glasgow Prognostic Score (GPS) 0 point: Normal p-alb and p-CRP 1 point: Low p-alb or p-CRP 2 points: Low p-alb and p-CRP

Statistics: T-test, Chi-square test and simple logistic regression analysis. Significance level: $p<0.05$.

Results

In total 277 INS and IF patients were included (age 59.5±15.2 Y, male 43.7%, BMI 22.1±4.3 kg/m²). Groups were comparable according to number, age and gender but more IF patients had decreased BMI, p-Alb, HGS and FFMI and raised CRP and GPS (Table 1).

Frequency of malnutrition using GPS (1-2 points) combined with BMI/FFMI/HGS showed 22.6/23.4/26.3% for INS (p=0.756) and 40.7/40.0/59.3% for IF (p=0.001) (Figure 2). Agreement between the criteria combinations were: 8.0% for INS and 25.7% for IF (Figure 3).

Significantly more with IF was diagnosed with severe malnutrition 43 vs. 26, p=0.012, OR 2.1 [1.18-3.75], but only a tendency in the group with moderate malnutrition 27 vs. 22, p=0.180, OR 1.6 [0.82-2.97] (Figure 4).

Table 1: Patient characteristics and diagnostic assessments

Variable	ALL patients*	INS patients*	IF patients*	p-value[¤]
Number	277	137	140	
Gender, male	43.7%	43.8%	43.6%	0.970
Age (years)	59.5±15.2	59.4±15.9	59.6±14.7	0.940
Body mass index, (kg/m²)	22.1±4.3	22.9±4.5	21.4±4.0	0.003
BMI below reference[a]	42.6%	40.7%	59.3%	0.012
HGS below reference[b]	53.1%	36.5%	69.3%	<0.001
FFMI below reference[c]	40.8%	32.9%	48.6%	0.008
Alb below reference[d]	63.2%	49.6%	76.4%	<0.001
CRP above reference[e]	44.0%	32.9%	55,0%	<0.001
GPS above reference[f]	71.8%	59.1%	84.3%	<0.001

*Mean (±SD) or %. [¤]Chi² test or t-test. Reference values: [a]BMI: ≥20 kg/m² if <70 y, ≥22 kg/m² if ≥70 y. [b]HGS: Age and sex dependent (Bohannon RW). [c]FFMI: Male ≥16,7 kg/m², Female ≥14,6 kg/m². [d]Alb: ≥36 g/l. [e]CRP: <8 mg/dl. [f]GPS ref.: 0 points.

Figure 2: Identification of malnutrition when combining GPS above reference with BMI, FFMI or HGS below reference.

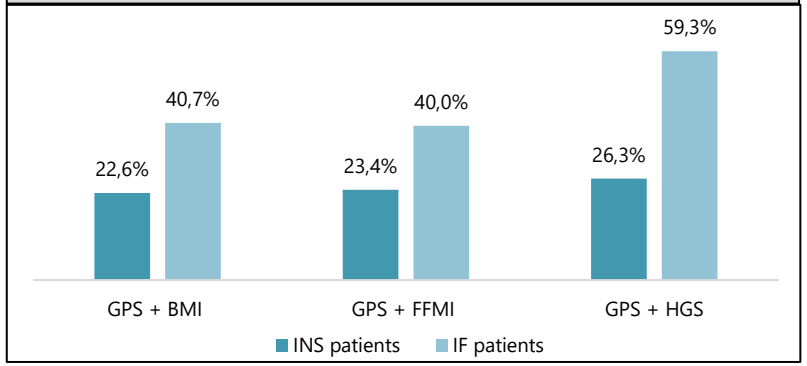


Figure 3: Agreement between criteria combinations when combining GPS above reference with BMI, FFMI or HGS below reference.

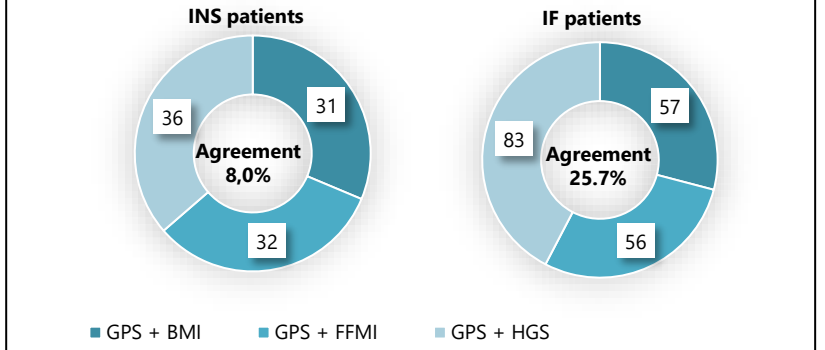
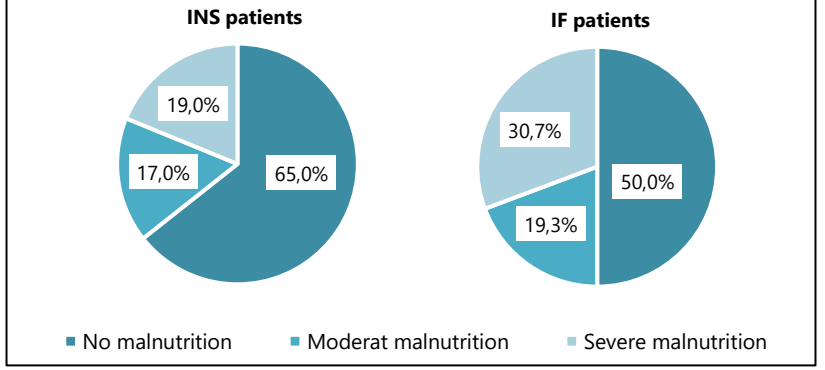


Figure 4: Malnutrition severity grading based on BMI



Conclusions

We found both frequency and severity of malnutrition to be higher in IF than INS patients.

GLIM-criteria was able to identify approximately same frequency of malnutrition in INS but not in IF, when combining Glasgow Prognostic Score with BMI, FFMI and HGS. However, the agreement was poor in both groups.

Consequently, further validation of GLIM is needed - including association to clinical outcome in lack of a gold standard.

References: [1]Cederholm T et al.

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