УДК 613.24+616.74:616.36-004:621.3.088.6
DOI http://doi.org/10.30978/MG-2026-1-35

ISSN 1727-5725 (Print)
ISSN 2521-649X (Online)

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A comparative study of the Global Leadership Initiative on Malnutrition criteria vs the Patient-Generated Subjective Global Assessment in predicting liver cirrhosis survival

Objective — to study the impact of malnutrition, determined by the Global Leadership Initiative on Malnutrition (GLIM) criteria and the Patient-Generated Subjective Global Assessment (PG-SGA), on the long-term survival of liver cirrhosis (LC) patients and to compare the prognostic value of these tools.

Materials and methods. A cohort of 170 patients with LC of viral, alcoholic, or mixed aetiology (58 women and 112 men, mean age 55.9 ± 11.2 years) was enrolled in the prospective study. The median follow-up period was 490 (IQR 293—642) days. During this time, 53 patients died due to liver-related complications. Nutritional state was assessed using the GLIM criteria and PG-SGA. The skeletal muscle index was utilised to assess muscle mass reduction, as a phenotypic GLIM criterion. The presence of inflammation, as an aetiologic criterion, was defined as a C-reactive protein level above 5 mg/L.

Results. Despite the similar prevalence of malnutrition detected using the GLIM criteria and PG-SGA (70.6 % and 61.8 % of patients, respectively), the diagnostic concordance between instruments was low (k Cohen's = 0.518). The severity of liver cirrhosis is directly correlated with the prevalence of malnutrition. Over 85 % of patients with Child–Turcotte–Pugh Class C cirrhosis were diagnosed with impaired nutritional state by either the GLIM criteria or PG-SGA. The GLIM criteria demonstrated poor predictive value for mortality (AUC 0.625, p = 0.006), whereas the PG-SGA showed acceptable predictive value (AUC 0.703, p = 0.000). Kaplan–Meier survival analysis revealed that the mortality rate among patients with impaired nutritional state, as assessed by both GLIM criteria and PG-SGA, was significantly higher than in those with normal nutritional state. The greatest negative impact of malnutrition on survival is concentrated within the first 6 months of follow-up. In the multivariate analysis only hypoalbuminemia, hepatic encephalopathy, and malnutrition determined by the PG-SGA had an independent impact on the time to death. The hazard ratio (HR) for mortality associated with malnutrition according to PG-SGA was 2.665 (p = 0.027). Malnutrition diagnosed by GLIM criteria was not an independent predictor of mortality (HR 1.617, p = 0.304).

Conclusions. PG-SGA demonstrates superior prognostic value over GLIM criteria in LC patients. There is a need for the clarification and further investigation of the GLIM criteria in LC.

Keywords: Global Leadership Initiative on Malnutrition, GLIM, The Patient-Generated Subjective Global Assessment, PG-SGA, malnutrition, liver cirrhosis, survival.

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Отримано • *Received* 17/09/2025. Прийнято до друку • *Accepted* 05/11/2025. Опубліковано • *Published* 30/03/2026

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The European Association for the Study of the Liver defines malnutrition as a nutrition-related disorder resulting from a lack of intake or uptake of nutrition that leads to altered body composition (decreased fat-free mass) and body cell mass, leading to diminished physical and mental function and impaired clinical outcome from disease [10]. Impaired nutritional state is a frequent complication of liver cirrhosis (LC) and is registered in 5—92 % depending on the assessment methods and severity of the underlying disease [29]. Recent data indicate that malnutrition is not merely a comorbid condition but a factor that significantly affects disease progression and worsens the prognosis. Impaired nutritional state is associated with a higher incidence of infectious complications, increased length of hospital stay and treatment costs, and reduced patient survival [4, 6, 7, 17, 31].

Despite the high prevalence and known negative impact on disease course, malnutrition and further need for nutritional interventions remain underestimated in clinical practice. A significant gap exists in nutritional screening, as almost half of LC patients do not undergo a nutritional assessment, and many clinicians lack awareness of the available diagnostic tools [3, 8]. Furthermore, accurate diagnosis of malnutrition in LC is complicated due to the presence of confounding factors such as oedema, ascites, obesity, and hepatic encephalopathy. Currently, there is no defined «gold standard» for nutritional assessment in LC. The optimal assessment tool should not only detect malnutrition per se but also predict the course of LC, select high-risk patients, and determine the need for nutritional intervention.

In 2019, a global consensus on diagnostic criteria was developed and published by the Global Leadership Initiative on Malnutrition (GLIM) to standardise the diagnosis of malnutrition and ensure its harmonisation across various clinical settings [5]. It was proposed that nutritional assessment should be based on phenotypic criteria (low body mass index, unintentional weight loss, and reduced muscle mass) combined with aetiologic criteria (reduced food intake or assimilation, disease burden, or inflammatory condition). The GLIM criteria have attracted considerable attention and have been widely implemented in clinical practice. Recent meta-analyses have shown that the GLIM criteria have promising diagnostic value in detecting malnutrition in the general population and in cancer patients [14, 30]. The GLIM criteria have been shown to be a valid assessment tool for malnutrition in patients with cirrhosis in recent studies [12, 32]. As GLIM was developed as a universal tool for malnutrition diagnosis, it is crucial to validate its criteria in patients with LC and determine its ability to predict unfavourable disease outcomes.

The Patient-Generated Subjective Global Assessment (PG-SGA) is used internationally as a comprehensive and holistic nutritional assessment tool developed to identify malnutrition and risk factors for malnutrition, determine the urgency of nutritional intervention, and monitor nutritional state over time. The PG-SGA is divided into two parts: the patient-generated section (self-report about weight loss, food intake, symptoms that impact nutrition, activity, and function level) and the professional assessment section (clinician's evaluation of disease, its relation to nutritional requirements, metabolic demand, assessment of fat and muscle stores, and fluid status) [21]. PG-SGA is used as the reference method for nutritional evaluation in cancer patients and is strongly associated with overall survival and risk of postoperative complications [15, 33]. We recently showed that PG-SGA is a valid and reliable nutritional assessment tool and can predict mortality in LC patients [22, 23].

Objective — to study the impact of malnutrition, determined by the Global Leadership Initiative on Malnutrition criteria and the Patient-Generated Subjective Global Assessment, on the long-term survival of patients with liver cirrhosis and to compare the prognostic value of these tools.

Materials and methods

Study population. A cohort of 170 patients with LC of viral, alcoholic, or mixed aetiology (58 women and 112 men, mean age 55.9 ± 11.2 years) was enrolled in the prospective study. All patients were informed of the aim and procedures of the study and provided their written consent. Exclusion criteria were acute-on-chronic liver failure, malignancy, and other conditions potentially associated with malnutrition. The patients were distributed according to the Child–Turcotte–Pugh (CTP) score: 23 patients in class A, 57 patients in class B, and 90 patients in class C. The demographic and clinical features of the cohort are shown in Table 1. The median (Mdn) and interquartile range (IQR) follow-up period was 490 (IQR 293—642) days. During this time, 53 patients died due to liver-related complications.

Nutritional state assessment. The GLIM assessment process involved two steps: malnutrition diagnosis based on phenotypic and aetiologic criteria, and grading of malnutrition severity based on phenotypic criteria. The phenotypic criteria for the diagnosis of malnutrition are: (1) weight loss > 5 % within the past 6 months, or > 10 % beyond 6 months; (2) low body mass index < 20 kg/m^2 if < 70 years, or < 22 kg/m^2 if > 70 years; (3) reduced

Table 1. **Baseline demographic and clinical characteristics of patients with liver cirrhosis**

Variables	Patients (n = 170)
Age, years	55.3 ± 11.6
Men	110 (64.7 %)
Viral (HBV, HCV)	27 (15.8 %)
Alcohol-related	96 (56.5 %)
Mixed aetiology	47 (27.6 %)
CTP	9.37 ± 2.32
MELD	26.11 ± 9.86
Gastroesophageal varices	101 (59.4 %)
Ascites grade 2—3	77 (45.3 %)
Hepatic encephalopathy II—III stage	47 (27.6 %)
Hydrothorax	36 (21.2 %)
Total bilirubin, μmol/L	43.0 (29—106)
Prothrombin time, INR	2.50 (1.31—3.17)
Platelets, per 1 mm^3	150.2 ± 72.7
Albumin, g/L	33.20 ± 5.98
Serum creatinine, μmol/L	75.0 (69.0—114)
hs-CRP, mg/L	12.1 ± 1.64
BMI, kg/m^2	25.8 ± 5.68
SMI, cm^2/m^2	
Men	50.12 ± 7.09
Women	37.21 ± 5.63
Sarcopenia	99 (58.2 %)
Patients died during follow-up	53 (31.2 %)

Note. Categorical variables are presented as the number of cases and percentage, while quantitative indicators are presented as M ± SD or Mdn (IQR).

muscle mass by validated body composition measuring techniques. The aetiologic criteria for the diagnosis of malnutrition are: (1) reduced food intake or assimilation < 50 % of energy requirements for > 1 week, or any reduction for > 2 weeks, or any chronic gastrointestinal condition that adversely impacts food assimilation or absorption; (2) inflammation due to acute disease/injury or chronic disease-related. Subjects fulfilling at least one of the three phenotypic criteria in combination with at least one of the two aetiologic criteria were regarded as malnutrition [5].

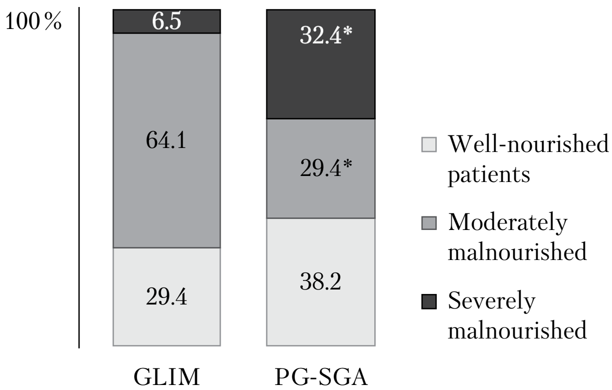
In this study, the skeletal muscle index (SMI) was utilised to assess muscle mass reduction. SMI measurement was performed using computed tomography, defining the cross-sectional skeletal muscle area at the L3 level and normalising it to the patient's height [25]. Reference SMI values for the Ukrainian population were determined earlier [20]. SMI ≤ 52.2 cm^2/m^2 and ≤ 39.3 cm^2/m^2 (two standard deviations below the mean value in the healthy Ukrainian individuals) were considered as sarcopenia in men and women, respectively. Decompensated cirrhosis is the hallmark of end-stage liver disease, characterised by a high disease burden and pronounced inflammation [11]. In this study, the presence of inflammation was defined as a high-sensitivity C-reactive protein (hs-CRP) level above 5 mg/L. Severe malnutrition was diagnosed if the patient met any of the following criteria: weight loss of > 10 % in the last 6 months or > 20 % in more than 6 months; low BMI (< 18.5 kg/m^2 in patients aged < 70 years or < 20 kg/m^2 in patients aged > 70 years) [5]; or SMI of ≤ 46.6 cm^2/m^2 and ≤ 34.2 cm^2/m^2 (three standard deviations below the mean value in healthy Ukrainian individuals).

The PG-SGA assessment process comprises two main components: the patient-generated questionnaire (known as the PG-SGA Short Form, covering weight loss, food intake, symptoms, activity, and function) and the professional worksheets (including calculation of percent weight loss, assessment of disease relation to nutritional requirements, metabolic demand, and a nutritionally oriented physical examination). The global PG-SGA category rating considers weight loss, nutrient intake, nutrition impact symptoms, functioning, and physical exam. The PG-SGA classifies patients into three categories: (A) well-nourished; (B) moderately malnourished/suspected malnutrition; or (C) severely malnourished. Severe malnutrition was diagnosed in case of weight loss > 10 % over the last 6 months or > 5 % over the last month; severely reduced or minimal oral intake; presence of multiple, uncontrolled nutrition impact symptoms (e.g., severe nausea, vomiting, diarrhea, mucositis) that severely impede adequate nutrition; significant limitation in daily activities (e.g., the patient is mostly bedridden or has minimal activity); severe loss of muscle mass (muscle wasting) and/or subcutaneous fat, often accompanied by oedema, ascites, or other signs of depletion. For this study, the Ukrainian version of the PG-SGA was employed. This version was translated and cross-culturally adapted based on the original PG-SGA (v4.3.20), which is publicly available at http://pt-global.org [22].

Statistical analysis. The data were processed using the SPSS22 software package (SPSS Inc.). The mean (M) and standard deviation (SD), and the median (Mdn) and interquartile range (IQR) were calculated. The parametric Student's t-test and non-parametric Mann–Whitney U test were used to assess the intergroup difference. The Fisher test was used to compare the frequency of changes. Spearman's Rank Order Correlation was used to determine the relationships between parameters. Diagnostic agreement between PG-SGA and GLIM criteria was assessed using Cohen's kappa statistic. The prognostic value of GLIM and PG-SGA was investigated using ROC analysis. The survival of the patients was analysed using Kaplan–Meier analysis, and the survival curves were compared using a Log Rank test. The Cox regression method was used to determine mortality predictors. The difference was considered statistically significant at $p < 0.05$.

Results and discussion

Malnutrition, as determined by the GLIM and PG-SGA tools, was detected in 70.6 % and 61.8 % of LC patients, respectively (Fig. 1). The prevalence of moderate malnutrition by the GLIM criteria was nearly twice the rate observed with PG-SGA. Conversely, severe malnutrition by the GLIM criteria was detected significantly less often than by PG-SGA.



* $p < 0.05$ regarding the corresponding nutritional state category according to GLIM

Figure 1. **Nutritional state of patients with liver cirrhosis according to GLIM criteria and PG-SGA**

For subsequent analysis, patients were classified into two categories: well-nourished patients and malnourished patients (moderate or severe).

The severity of the underlying liver disease was directly associated with an increased prevalence of malnutrition (Table 2). Malnutrition was diagnosed in 86.7 % and 87.8 % of patients with LC CTP Class C using the GLIM criteria and PG-SGA, respectively. Patients diagnosed with impaired nutritional state demonstrated significantly higher rates of LC decompensation markers, including moderate-to-severe ascites, overt hepatic encephalopathy, and hypoalbuminemia. The mean MELD score was notably higher in malnourished patients (GLIM: 27.5 ± 7.21; PG-SGA: 30.8 ± 7.25) compared to those who were well-nourished (GLIM: 20.3 ± 8.60; PG-SGA: 17.3 ± 5.94) ($p < 0.05$).

Inter-rater agreement for the categorical nutritional assessment (well-nourished vs. malnutrition) using the GLIM criteria and PG-SGA was evaluated with the Cohen's kappa statistic. The diagnostic agreement between the two tools was found to be weak (k Cohen's = 0.518). This low level of concordance demonstrates that a significant proportion of patients are classified into different nutritional categories by the two methods (Table 3).

The prognostic value of both nutritional assessment tools was evaluated in a prospective study. Analysis revealed that the vast majority of patients who died during the follow-up period had impaired nutritional state at the baseline assessment (Table 4).

Utilizing LC-related mortality as the primary endpoint, the prognostic value of the nutritional assessment tools was evaluated in ROC analysis (Fig. 2). The GLIM criteria demonstrated poor predictive value for long-term mortality (AUC 0.625; $p = 0.006$), whereas the PG-SGA showed acceptable predictive value (AUC 0.703; $p = 0.000$).

Kaplan–Meier survival analysis revealed that the mortality rate among patients with impaired nutritional state, as assessed by both GLIM criteria and PG-SGA, was significantly higher than

Table 2. **Prevalence of malnutrition stratified by liver cirrhosis severity**

Nutritional state		CTP class A (n = 23)	CTP class B (n = 57)	CTP class C (n = 90)
GLIM	Well-nourished	19 (82.6 %)	19 (33.3 %)*	12 (13.3 %)*#
	Malnutrition	4 (17.4 %)	38 (66.7 %)*	78 (86.7 %)*#
PG-SGA	Well-nourished	22 (95.7 %)	32 (56.1 %)*	11 (12.2 %)*#
	Malnutrition	1 (4.3 %)	25 (43.9 %)*	79 (87.8 %)*#

Note. * The difference from the CTP class A group is statistically significant ($p < 0.05$).
The difference from the CTP class B group is statistically significant ($p < 0.05$).

Table 3. **Diagnostic agreement between PG-SGA and GLIM criteria (n = 170)**

		PG-SGA		r Spearman's	k Cohen's
		Well-nourished, n	Malnutrition, n		
GLIM	Well-nourished, n	39	11	0.558 p < 0.001	0.518 p < 0.001
	Malnutrition, n	26	94		

Table 4. **Baseline nutritional state of liver cirrhosis patients stratified by survival outcome during follow-up**

Baseline nutritional state	Survived (n = 117)	Deceased (n = 53)
GLIM		
Well-nourished	45 (38.5 %)	5 (9.4 %)*
Malnutrition	72 (61.5 %)	48 (90.6 %)*
PG-SGA		
Well-nourished	57 (48.7 %)	8 (15.1 %)*
Malnutrition	60 (51.3 %)	45 (84.9 %)*

Note. * The difference regarding patients who survived is statistically significant (p < 0.05).

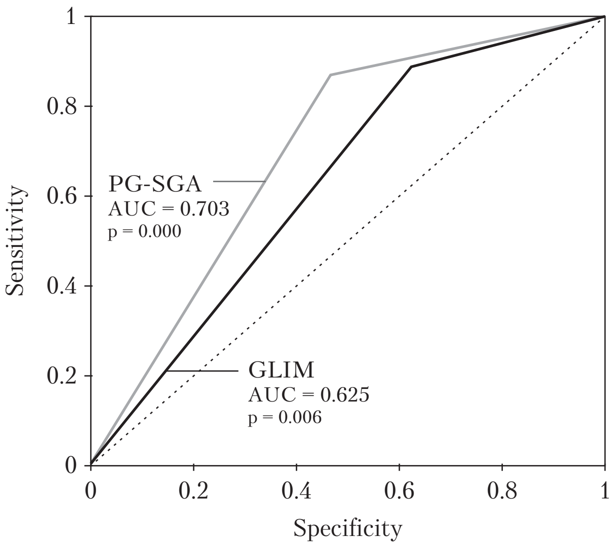


Figure 2. **ROC curves for predicting mortality in liver cirrhosis patients based on nutritional state determined by GLIM criteria and PG-SGA**

in those with normal nutritional state (Fig. 3). Notably, the greatest negative impact of malnutrition on survival was concentrated within the first 3—6 months of follow-up.

To determine whether malnutrition, as assessed by GLIM and PG-SGA, serves as an independent predictor of mortality in LC patients, we applied the Cox proportional hazards model. Univariate regression analysis identified several factors as potential mortality predictors (Table 5): ascites (grade 2—3), hydrothorax, hepatic encephalopathy (stage II—III), elevated total serum bilirubin (> 103 μmol/L), hypoalbuminemia (< 30 g/L), thrombocytopenia (< 100 per 1 mm^3), and nutritional deficiency according to both GLIM criteria and PG-SGA. In the multivariate analysis only hypoalbuminemia, hepatic encephalopathy, and malnutrition determined by the PG-SGA had an

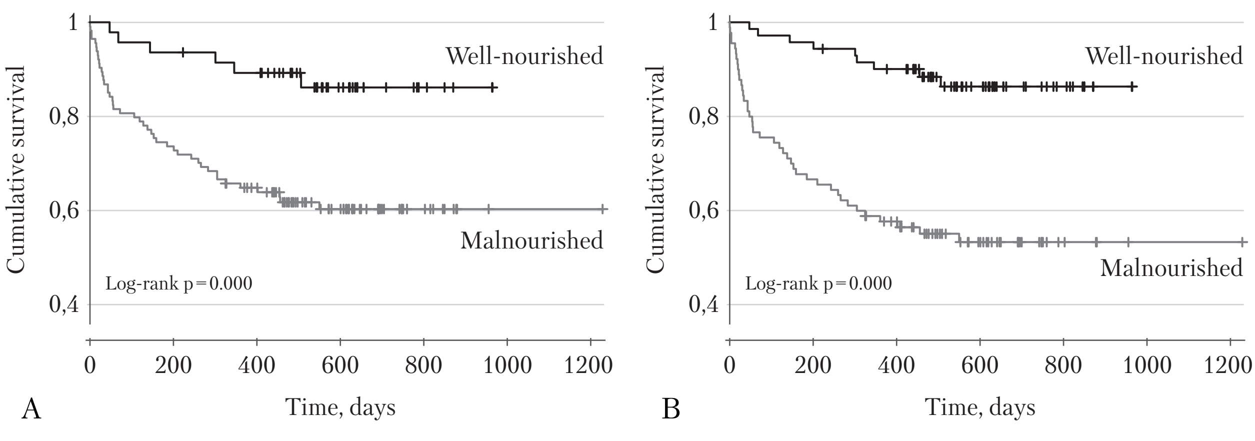


Figure 3. **Kaplan-Meier survival curves in liver cirrhosis patients: comparison of well-nourished vs. malnourished groups assessed by GLIM criteria (A) and PG-SGA (B)**

Table 5. **Cox regression analysis for mortality**

Variables	Univariate			Multivariate, GLIM included			Multivariate, PG-SGA included		
	HR	95 % CI	p	HR	95 % CI	p	HR	95 % CI	p
Aetiology (alcohol-related)	1.298	0.594—2.232	0.420						
Gender (male)	1.089	0.621—1,909	0,686						
Ascites (grade 2—3)	3.276	1.898—5.655	0.003	0.951	0.456—1.986	0.895	1,009	0.491—2.073	0.980
Hydrothorax (present)	4.439	2.569—7.673	0.000	1.341	0.454—2.986	0.292	1.730	0.842—3.555	0.136
Encephalopathy (II—III stage)	4.272	2.243—8.137	0.000	2.535	1.237—5.195	0.011	2.403	1.173—4.922	0.017
Serum bilirubin (> 103 μmol/L)	1.847	1.073—3.181	0.027	1.364	0.788—2.364	0.268	1.337	0.772—2.313	0.300
Serum albumin (< 30 g/L)	4.025	2.316—6.995	0.000	2.733	1.489—5.015	0.001	2.491	1.375—4.513	0.003
Prothrombin time, INR (> 2)	2.132	0.989—3.557	0.055						
Platelets (< 100 per mm^3)	2.154	1.217—3.815	0.008	1.103	0.541—2.363	0.592	1.301	0.623—2.784	0.487
Serum creatinine (> 133 μmol/L)	1.723	0.887—3.349	0.108						
GLIM (malnutrition)	3.959	1.692—9.265	0.002	1.617	0.647—4.042	0.304			
PG-SGA (malnutrition)	6.162	2.778—13.666	0.000				2.665	1.121—6.338	0.027

independent impact on the time to death. The hazard ratio (HR) for mortality associated with malnutrition according to PG-SGA was 2.665 ($p = 0.027$). Malnutrition diagnosed by GLIM criteria was not an independent predictor of mortality.

Impaired nutritional state is a highly prevalent issue among patients with chronic liver disease. S. Shin et al., in an analysis of 16 studies, demonstrated that the prevalence of malnutrition was 36.4 % (10—80.3 %) across all patients with liver disease, 39.9 % (13.3—03 %) in those with compensated liver disease, and 44.1 % (26.7—93.6 %) in patients with decompensated cirrhosis [26]. In our cohort, the vast majority of patients (86.4 %) presented with decompensated LC. Malnutrition was diagnosed in 70.6 % of patients according to the GLIM criteria and in 61.8 % according to the PG-SGA. Our findings substantiate the strong association between malnutrition and the severity of the underlying disease. The mean MELD score was significantly higher in patients with malnutrition compared to those with a normal nutritional state. Furthermore, over 85 % of patients with CTP Class C cirrhosis were found to have an impaired nutritional state by either the GLIM criteria or PG-SGA.

Despite the similar prevalence of malnutrition detected using the GLIM criteria and PG-SGA, the diagnostic agreement between these tools in our cohort was found to be low (k Cohen's = 0.518). This suggests that GLIM and PG-SGA classify a significant proportion of patients into different nutritional state categories. This finding aligns with previous research: T. Sakaguchi et al. demonstrated that GLIM classified 35 % of patients with terminal cancer as well-nourished, whereas the PG-SGA identified none as such (k Cohen's = 0.037) [24]. Weak concordance between the GLIM and PG-SGA criteria in cancer patients has also been reported in other studies [13, 16]. Conversely, S. Tan et al. showed moderate agreement between PG-SGA and the GLIM criteria (applied retrospectively) in patients with hepatocellular carcinoma (k Cohen's = 0.68) [28].

It has become evident over the last decade that malnutrition is one of the most significant independent prognostic factors regarding the outcomes of LC, duration of hospital stay, and mortality [9, 19]. In a cross-sectional study evaluating nutritional state, severe complications such as refractory ascites, hepatic encephalopathy, spontaneous bacterial peritonitis, and hepatorenal syndrome developed in 65.5 % of malnourished patients versus only 11.8 % of well-nourished patients ($p < 0.05$) [1]. Furthermore, malnutrition was associated with a higher frequency of infectious complications in hospitalised LC patients [17]. In our study, 90.6 % and 84.9 % of the patients who died during the follow-up period had malnutrition, according to the GLIM criteria and PG-SGA, respectively. Kaplan–Meier survival analysis confirmed that the long-term survival of patients with malnutrition, evaluated by both instruments, was significantly lower than that of patients with a normal nutritional state. We observed the greatest impact of malnutrition on survival within the first 3–6 months of follow-up.

Existing data regarding the prognostic value of GLIM criteria in LC are limited. G. Guo et al. showed that malnutrition by the GLIM criteria (skeletal muscle mass loss was assessed using both handgrip strength and the tomography-demarcated skeletal muscle index) was independently associated with 1-year all-cause mortality among hospitalised patients with LC [12]. In a study by W. Yang et al., malnutrition according to the GLIM criteria was demonstrated to be associated with an increased risk of in-hospital mortality and prolonged length of stay in hospitalised LC patients [32]. In our cohort, the GLIM criteria were inferior to the PG-SGA in predicting patients' long-term survival. In ROC analysis, the GLIM instrument showed insufficient predictive value, whereas the PG-SGA demonstrated acceptable value in forecasting fatal outcomes. Furthermore, in multivariate regression analysis, malnutrition assessed by the PG-SGA (HR 2.665; $p < 0.05$), but not the GLIM criteria, had an independent effect on the time to death in LC patients.

Such a disparity in the prognostic value between PG-SGA and GLIM can be attributed to several factors. The PG-SGA instrument incorporates seven nutritional parameters: change of body weight, food intake, symptoms limiting food intake, impaired activity and functional state, the impact of the primary disease, patient's metabolic demands, and physical signs of altered body composition and fluid retention [15]. Thus, PG-SGA assesses all domains of malnutrition and identifies risks of an impaired nutritional state, contributing to a thorough and holistic assessment.

The practical application of GLIM phenotypic criteria presents certain limitations in LC patients. The presence of ascites and oedema often masks underlying weight changes, potentially leading to a falsely elevated body mass index. The assessment of the muscle mass loss criterion is also complicated in LC patients. GLIM suggests using Dual-Energy X-ray Absorptiometry, or alternatively, computed tomography or anthropometry. It is known that fluid retention can distort the results of absorptiometry or anthropometry [27]. In this study, we utilized a validated radiological method for determining skeletal muscle mass and applied predefined SMI reference values specific to the Ukrainian population. However, it should be noted that the routine use of computed tomography for sarcopenia assessment is limited because it requires specific training and qualification of the radiologist, specialised software, and dedicated time [18]. There are currently no clear guidelines for assessing the GLIM aetiologic criteria in LC patients. The instrument does not offer a quantitative evaluation of reduced food intake (ranging from slight restriction to the inability to eat). It also remains unclear whether all cases of LC should be regarded as a systemic inflammatory state, and whether C-reactive protein determination is necessary for inflammation assessment [2]. Given these considerations, combined with the insufficient prognostic value demonstrated, there is a clear necessity for clarifying and adapting the GLIM criteria for patients with LC.

Conclusions

Despite the similar prevalence of malnutrition detected using the GLIM criteria and PG-SGA (70.6 % and 61.8 % of LC patients, respectively), the diagnostic concordance between these two instruments was found to be low (k Cohen's = 0.518).

The severity of liver cirrhosis is directly correlated with the prevalence of malnutrition. Over 85 % of patients with Child–Turcotte–Pugh Class C cirrhosis were diagnosed with impaired nutritional state by either the GLIM criteria or PG-SGA.

The long-term mortality rate among patients with impaired nutritional state, assessed by both GLIM and PG-SGA, is significantly higher than in those with a normal nutritional state. The greatest negative impact of malnutrition on survival is concentrated within the first 6 months of follow-up.

Malnutrition assessed by the PG-SGA, but not the GLIM criteria, demonstrated an independent effect on the time to death in LC patients (HR 2.665; $p = 0.027$ vs. HR 1.617; $p = 0.304$).

Ethical statement. The Bioethics Committee of the National Pirogov Memorial Medical University (Protocol No 8 of 17.10.2019) found that the study did not contradict the basic bioethical standards of the Helsinki Declaration, the Council of Europe Convention on Human Rights and Biomedicine (1977), WHO regulations, and Ukrainian law.
Conflicts of interest: none.
Authorship contributions: conception and design — N. O. P., V. M. M.;
data collection, analysis and interpretation of data — N. O. P., V. M. M., L. O. P., N. V. Z.;
drafting the article — V. M. M., L. O. P.; critical revision of the article — N. O. P., N. V. Z.

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Порівняльне дослідження критеріїв Global Leadership Initiative on Malnutrition та Patient-Generated Subjective Global Assessment для прогнозування виживаності пацієнтів із цирозом печінки

Мета — вивчити вплив мальнутриції, визначеної за критеріями Global Leadership Initiative on Malnutrition (GLIM) та Patient-Generated Subjective Global Assessment (PG-SGA), на довгострокову виживаність пацієнтів із цирозом печінки (ЦП) та порівняти прогностичну цінність цих інструментів.

Матеріали та методи. У проспективне дослідження було залучено 170 пацієнтів із ЦП вірусної, алкогольної або змішаної етіології (58 жінок та 112 чоловіків, середній вік — (55,9 ± 11,2) року). Медіана періоду спостереження становила 490 (міжквартильний інтервал — 293—642) діб. Протягом цього періоду 53 пацієнти померли внаслідок ускладнень, пов'язаних із ЦП. Нутритивний стан оцінювали за критеріями GLIM та PG-SGA. Для оцінки зменшення м'язової маси використовували індекс скелетної мускулатури як один із фенотипових критеріїв GLIM. Наявність запалення, як етіологічний критерій, визначали як рівень С-реактивного білка > 5 мг/л.

Результати. Попри подібну частоту мальнутриції, виявлену за допомогою критеріїв GLIM та PG-SGA (70,6 і 61,8 % відповідно), діагностична узгодженість між інструментами була низькою (k Cohen's = 0,518). Ступінь тяжкості ЦП прямо корелював із частотою мальнутриції. Понад 85 % пацієнтів із цирозом класу С за системою Чайлда — Тюркотти — П'ю мали порушений нутритивний стан за критеріями GLIM або PG-SGA. Критерії GLIM продемонстрували низьку прогностичну цінність (AUC = 0,625; p = 0,006), тоді як шкала PG-SGA — прийнятну прогностичну цінність щодо смертності пацієнтів із ЦП (AUC = 0,703; p = 0,000). Аналіз виживаності методом Каплана — Мейєра виявив, що рівень смертності серед пацієнтів із порушеним нутритивним станом, оціненим за критеріями як GLIM, так і PG-SGA, був значно вищим, ніж у пацієнтів із задовільним нутритивним станом. Найбільший негативний вплив мальнутриції на виживаність спостерігався впродовж перших 6 міс спостереження. У багатофакторному регресійному аналізі лише гіпоальбумінемія, печінкова енцефалопатія та мальнутриція, діагностована за PG-SGA, мали незалежний вплив на час настання смерті. Відношення ризиків смерті, пов'язаної з мальнутрицією за PG-SGA, становило 2,665 (p = 0,027). Мальнутриція, визначена за критеріями GLIM, не була незалежним предиктором смертності (відношення ризиків — 1,617; p = 0,304).

Висновки. PG-SGA демонструє вищу прогностичну цінність порівняно з критеріями GLIM у пацієнтів із ЦП. Є потреба в уточненні та подальшому дослідженні критеріїв GLIM у контексті ЦП.

Ключові слова: Глобальна лідерська ініціатива з мальнутриції, GLIM, Шкала сукупного суб'єктивного оцінювання стану пацієнта, PG-SGA, мальнутриція, цироз печінки, виживання.

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Pentiuk NO, Motsiuk VM, Pentiuk LO, Zaichko NV. A comparative study of the Global Leadership Initiative on Malnutrition criteria vs the Patient-Generated Subjective Global Assessment in predicting liver cirrhosis survival. Modern Gastroenterology (Ukraine). 2026;1:35-43. http://doi.org/10.30978/MG-2026-1-35.