COMPARISON OF THE EFFICACY OF SIX NUTRITIONAL SCREENING TOOLS IN PREDICTING MALNUTRITION IN HEMODIALYSIS PATIENTS

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INTRODUCTION: Protein-Energy-Malnutrition or Protein-Energy-Wasting in hemodialysis patients is a very common and multifactorial health problem, associated strongly with poor quality of life and increased risk of morbidity and mortality.[1-3] The absence of a gold standard method in evaluating nutritional status or nutritional screening for this specific group of patients in Greece, urged us to evaluate the efficacy of 6 nutritional risk tools commonly used in those patients according to bibliography.[4-6]

OBJECTIVE: To compare the efficacy of six nutritional screening tools in predicting malnutrition in Greek hemodialysis patients.

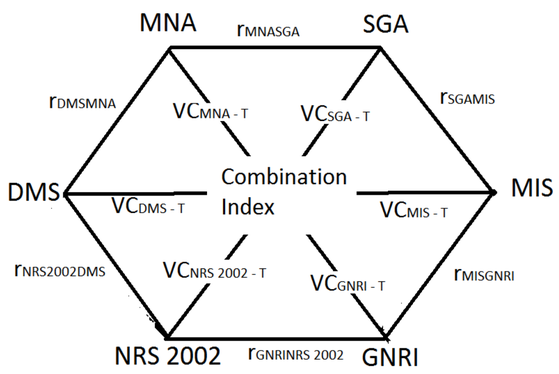
METHODS

39 hemodialysis patients 27 males, 12 females aged 69.5±12.9 and 77.4±8.3 respectively, were examined at the hemodialysis unit of "Konstantopouleio" General Hospital in Athens. Patients with active infection, cancer, major cardiovascular events, or gastrointestinal and hepatic diseases were excluded. Statistical analysis was carried out using the software IBM SPSS version 19.0

Table 1:

Characteristics of patients (n=39)	Male	Female
Gender	27 (69.2%)	12 (30.8%)
Age (years)	69.5±12.9	77.4±8.3
Duration of dialysis (years)	4.3±3.4	5.9±5.1
Presence of Diabetes	8 (29.6%)	3 (25.0%)

Figure 1:
The extended method of Triads to estimate validity coefficients between the nutritional screening tools



This statistical method is used for the evaluation of validity even when the true value is latent.

A Combined Index for malnutrition was calculated and used as a reference criterion. It came from a merge of the nutritional tools measured: If the patient was assessed as malnourished to any degree according to at least 4 out of 6 nutritional tools, then he/she was categorized as malnourished by the Combined Index.[7-9]

RESULTS:

Table 3: Prevalence of malnutrition or risk malnutrition according to the 6 nutritional screening indices and the combined index

Screening tool	Normal nutritional status	Malnutrition or Risk of malnutrition
SGA	13 (33.3%)	26 (66.7%)
MIS	15 (38.5%)	24 (61.5%)
GNRI	7 (19.7%)	32 (82.1%)
NRS2002	9 (23.1%)	30 (76.9%)
MDS	1 (2.6%)	38 (97.4%)
MNA	15 (38.5%)	24 (61.5%)
Combined index	10 (25.6%)	29 (74.4%)

Malnutrition and/or nutritional risk varied greatly, ranging from 61.5% to 97.4% depending on the nutritional tool used. According to the Combined Index it was 74.4%.

Table 2: Presentation of the nutritional screening tools used for the evaluation of malnutrition

Nutritional Tool	Year of Validation	Measurements and Data
SGA	1987	Weight change, change in dietary intake, functional capacity, gastrointestinal disturbances, physical signs of malnutrition
NRS 2002	2002	Weight change, nutritional intake, severity of disease, age
GNRI	2005	Serum albumin, weight alterations
MNA-SF	2001	Anthropometric data, physical + cognitive condition, mobility
DMS	1999	As SGA but in a fully quantitative way
MIS	2001	As SGA plus serum albumin, BMI, TIBC

Evaluation of nutritional status was carried out by using the following nutritional screening tools: Subjective Global Assessment (SGA), Malnutrition Inflammation Score (MIS), Geriatric Nutritional Reference Score (GNRI), Nutritional Risk Index (NRS 2002), Mini Nutritional Assessment (MNA-SF), Dialysis Malnutrition Score (DMS).

Table 4: Statistical evaluation of the nutritional tools compared to the Combined index

Screening tool	SGA	MIS	GNRI	NRS 2002	DMS	MNA
Sensitivity	86.2%	82.8%	93.1%	96.6%	100%	72.4%
Specificity	90%	100%	50%	80%	10%	70%
Positive Predictive Value	96.2%	100%	84.4%	93.3%	76.3%	87.5%
Negative Predictive Value	69.2%	66.7%	71.4%	88.9%	100%	46.7%
K value	**0.694**	0.711	0.478	**0.791**	0.142	0.364
(p)	(≤0.01)**	(≤0.01)**	(≤0.01)**	(≤0.01)**	(0.084)+	(≤0.05)*
VC	**0.676**	0.242	0.077	**0.802**	0.413	0.145
(95% CI)	0.458-0.817	0.027-0.479	0.191-0.690	0.651-0.892	0.112-0.645	0.179-0.440

K value derived from the Cohen's kappa statistics. It was calculated to determine the degree of concordance between the nutritional tools. If κ=1 means full concordance, if κ ≤ 0 means no concordance between the nutritional tools. VC= Validity Coefficients between nutritional tools and the Combined Index

NRS-2002 and SGA seemed to be the most valid tools (VC= 0.802 95% CI: 0.651-0.892, VC= 0.6769% CI: 0.458-0.817 respectively), and were also in better agreement with the Combined Index (K= 0.791 p≤ 0.01, K= 0.694 p≤ 0.01 respectively). Both tools also presented high sensitivity, specificity, positive and negative predictive value.

CONCLUSION: SGA and NRS-2002 appeared as the most valid and reliable tools in the evaluation both of malnutrition and risk of malnutrition in a sample of hemodialysis patients in Greek population. SGA is considered as a valid tool for assessing nutritional status in the hemodialysis patients according to NFK/DOQI, whereas the use of NRS-2002 is the official guideline of the European Society of Parenteral-Enteral Nutrition (ESPEN) for nutritional screening in the intensive care unit patients.

REFERENCES/BIBLIOGRAPHY:

1. Gracia-Iguacel C, González-Parra E, Barril-Cuadrado G, Sánchez R, Egido J, Ortiz-Arduán A, Carrero JJ., Defining protein-energy wasting syndrome in chronic kidney disease: prevalence and clinical implications.Nefrologia. 2014; 34(4):507-19.
2. Fouque D1, Kalantar-Zadeh K, Kopple J, Cano N, Chauveau P, Cuppari L, Franch H, Guarnieri G, Ikizler TA, Kaysen G, Lindholm B, Massy Z, Mitch W, Pineda E, Stenvinkel P, Treviño-Becerra A, Wanner C., A proposed nomenclature and diagnostic criteria for protein-energy wasting in acute and chronic kidney disease. Kidney Int. 2008 Feb; 73(4):391-8. Epub 2007 Dec 19.
3. Stenvinkel P, Heimbürger O, Paultre F, Diczfalusy U, Wang T, Berglund L, Jogestrand T.
Strong association between malnutrition, inflammation, and atherosclerosis in chronic renal failure.
Kidney Int. 1999 May; 55(5):1899-911.
4. Kalantar-Zadeh K, Kleiner M, Dunne E, Lee GH, Luft FC., A modified quantitative subjective global assessment of nutrition for dialysis patients. Nephrol Dial Transplant. 1999 Jul; 14(7):1732-8.
5. Fiedler R, Jehle PM, Osten B, Dorligschaw O, Girndt M., Clinical nutrition scores are superior for the prognosis of haemodialysis patients compared to lab markers and bioelectrical impedance. Nephrol Dial Transplant. 2009 Dec; 24(12):3812-7
6. Yamada K, Furuya R, Takita T, Maruyama Y, Yamaguchi Y, Ohkawa S, Kumagai H., Simplified nutritional screening tools for patients on maintenance hemodialysis.
Am J Clin Nutr. 2008 Jan; 87(1):106-13.
7. Pablo AR, Izaga MA, Alday LA., Assessment of nutritional status on hospital admission: nutritional scores. Eur J Clin Nutr. 2003 Jul; 57(7):824-31.
8. Kabagambe EK, Baylin A, Allan DA, Siles X, Spiegelman D, Campos H., Application of the method of triads to evaluate the performance of food frequency questionnaires and biomarkers as indicators of long-term dietary

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Dialysis - Nutrition & Inflammation
Petrini Plytzanopoulou
DOI: 10.3252/pso.eu.54ERA.2017
ePosters supported by F. Hoffmann- La Roche Ltd.
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