

Association of the Malnutrition-Inflammation Score with First 90 Day Mortality in Incident Hemodialysis Patients

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INTRODUCTION

Protein-energy wasting (PEW) is associated with increased mortality in hemodialysis (HD) patients but its association with first 90-day death in incident HD patients is not clear. The Malnutrition-Inflammation Score (MIS), an evaluator-friendly composite score ranging from 0 (well-nourished) to 30 (severely malnourished), includes 10 components (each with a score between 0 to 3) across nutritional history (5 components), nutritional physical exam (2 components), BMI and 2 laboratory values (albumin and transferrin). MIS is a quantifiable number produced using a combination of factors, including albumin, and may be a more comprehensive evaluation of nutritional status than albumin alone. We hypothesized that deteriorating nutritional status detected by MIS is associated with increased first 90-day mortality in incident HD patients.

METHODOLOGY

- During the first calendar quarter of 2009 the MIS was recorded by over 1100 dietitians in 9,441 incident (vintage <90 days) and 19,174 prevalent HD patients.
- MIS scores (described in Figure 1) were divided into 4 worsening quartiles.
- Incident patient mortality was defined as the numbers of death occurring within 90 days of the first treatment at the facility per 100 patient years.
- Crude and relative mortality across quartiles were calculated including after adjustment for age, gender, diabetes, race/ethnicity and vintage.

RESULTS

Figure 1. Malnutrition-Inflammation Score Scale



Figure 2. Average MIS in Incident and Prevalent Patients

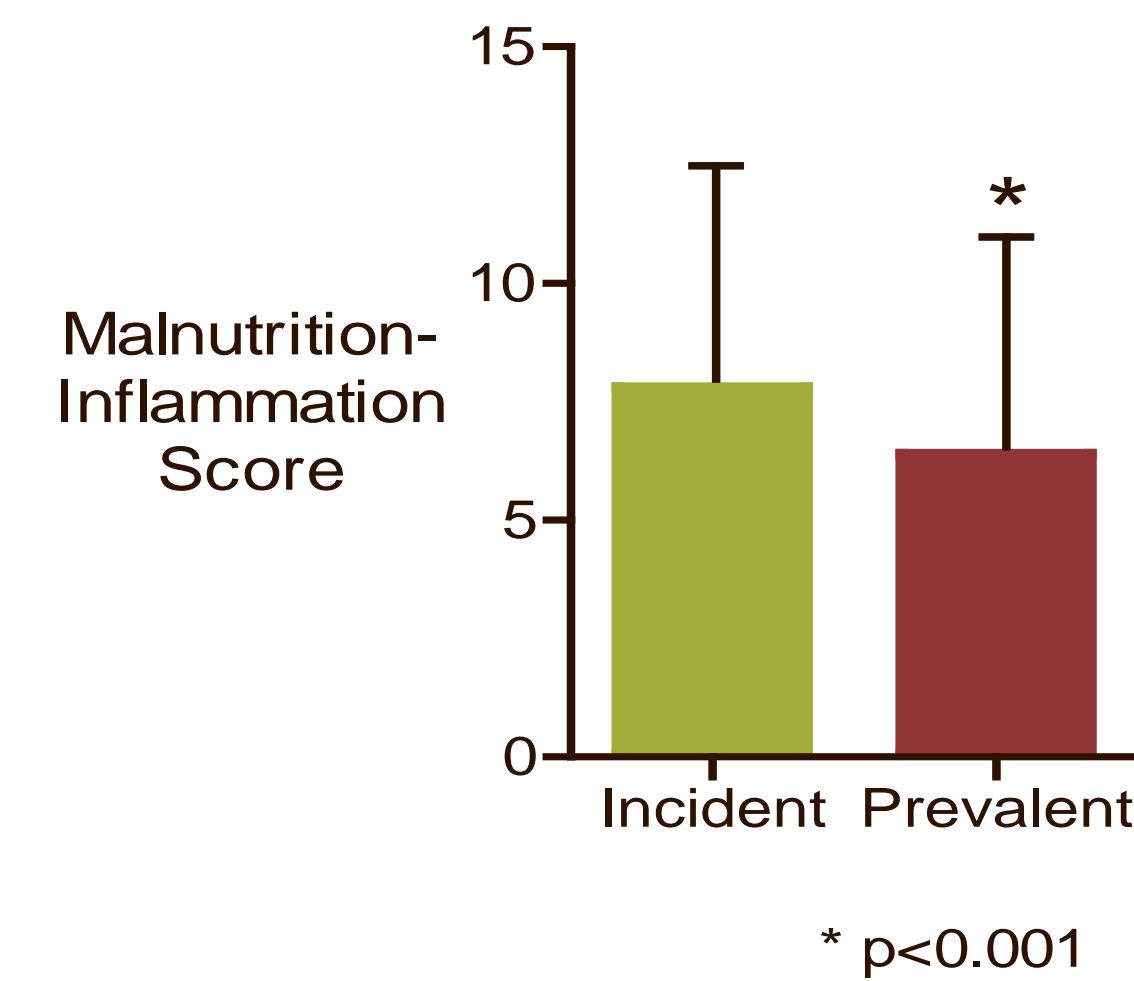


Table 1. Patients Demographics

Mean ± SD	Incident Patients
N	44,169
Age (yr)	60.5 ± 15.3
% Male	55.9%
<i>Race and Ethnicity</i>	
% African American	35.4%
% Hispanic	15.3%
% Asian, Pacific Islander	3.7%
% Native American	1.3%
% Unknown	0.1%
% Diabetic	72.1%
Vintage (yr)	2.9 ± 3.6
BMI	27.8 ± 7.3

Table 2. Mortality in Incident Patients by MIS

	MIS score 0-3	MIS score 4-5	MIS score 6-8	MIS score ≥9
N	7,151	5,840	6,919	8,708
Deaths per 100 patient years	4.9	9.1	15.3	41.6
Relative Mortality	1.0 (ref)	1.9 (1.7-2.7)	3.1 (2.4-3.9)	8.6 (6.7-10.9)

SUMMARY of RESULTS

- Incident HD patients had poorer nutritional status (mean ± SD; MIS=7.8±4.4) than prevalent patients (MIS= 6.4±4.5, p<0.001; Figure 2).
- Relative risk of death in the first 90 days after initiating dialysis increases as malnutrition-inflammation status deteriorates.
- Risk of death among patients within the highest quartile of malnutrition-inflammation scores is 8.6 times higher than that among patients with the lowest scores (Table 2).

KEY LEARNINGS

- ✓ In incident HD patients, poorer nutritional status determined by MIS is a strong predictor of short-term death.
- ✓ Improving nutritional status in incident HD patients may improve survival, which needs to be tested in controlled trials.

We express our sincere appreciation to the teammates in our nearly 1600 clinics who work every day not only to take care of patients but also to ensure the extensive data collection on which our work is based. We thank DaVita Clinical Research® for support in preparing this poster. DCR is committed to advancing the knowledge and practice of kidney care.

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American Society of Nephrology RenalWeek 2010, Denver, CO