

Geriatric nutritional risk index (GNRI) predicts long-term survival and limb events in patients with peripheral artery disease

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Background: Geriatric nutritional risk index (GNRI) was developed as a "nutrition-related" risk index and was reported in different populations as associated with the risk of all-cause and cardiovascular morbidity and mortality.

Purpose: The purpose of this study was to assess the associations of GNRI with mortality and amputation free survival in patients with peripheral artery disease (PAD).

Methods: From January 2011 to June 2016, 295 consecutive patients (73.3±9.2 years; 75.6% male) with PAD undergoing endovascular treatment (EVT) in our hospital were retrospectively examined. The GNRI on admission was calculated as follows: $14.89 \times \text{serum albumin (g/dl)} + 41.7 \times \text{body mass index (BMI)}/22$. Characteristics and mortality were compared between 2 groups: low GNRI (<92, n=110) with moderate or severe nutritional risk; and high GNRI (≥92, n=185) with no or low nutritional risk.

Results: The median follow up period was 39.4±26.4 months. There were 85 deaths (28.8%) and 13 major amputation (4.4%) during the follow-up. Patients in the low-GNRI group were more often higher age, non-ambulatory state, hemodialysis and critical limb ischemia. BMI, serum hemoglobin, albumin, low-density lipoprotein were significantly lower, whereas serum C-reactive protein was significantly higher in the low-GNRI group than the high-GNRI group ($P<0.05$, respectively). Kaplan–Meier analysis revealed that patients in the low-GNRI group had a significantly lower amputation free survival, compared to those in the high-GNRI group (log-rank test, $P<0.001$).

Conclusion: The low GNRI is associated with an increased risk of mortality and limb events in patients with PAD.

Table 1. Clinical characteristics

	Overall (n=295)	High GNRI (n=185)	Low GNRI (n=110)	P-value
Age, years	73.2±9.2	71.7±8.8	76.1±9.2	<0.001
Male, %	223 (75.6)	142 (76.8)	81 (73.6)	0.546
Body mass index	22.6±3.4	24.1±3.0	20.1±2.7	<0.001
Diabetes, %	174 (59.0)	117 (63.2)	57 (51.8)	0.054
Hemodialysis, %	77 (26.1)	41 (22.2)	36 (32.7)	0.046
Non-ambulatory status, %	54 (18.3)	13 (7.0)	41 (37.3)	<0.001
Critical limb ischemia, %	111 (37.6)	51 (27.6)	60 (54.6)	<0.001
Serum hemoglobin, g/dl	11.9±2.6	12.7±1.8	10.7±2.2	<0.001
Serum albumin, g/dl	3.5±0.6	3.8±0.4	3.0±0.5	<0.001
Major amputation, %	13 (4.4)	4 (2.2)	9 (8.2)	0.015
All cause death, %	85 (28.8)	39 (21.1)	46 (41.8)	<0.001

