



Impact of Preoperative Nutritional Status on Outcomes in Acute Type A Aortic Dissection

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Background



- Preoperative nutritional status is used to predict morbidity and mortality, its effect on the outcomes of acute type A aortic dissection (ATAAD) has not been examined.
- The objective was to evaluate the role of preoperative nutritional status in predicting postoperative morbidity and mortality in ATAAD.

Materials and Methods



580 patients May 2004 – February 2023

Acute type A Aortic Dissection (AAD)

undergone emergent surgical management in Shinshu University Hospital

- Preoperative nutritional status was evaluated using

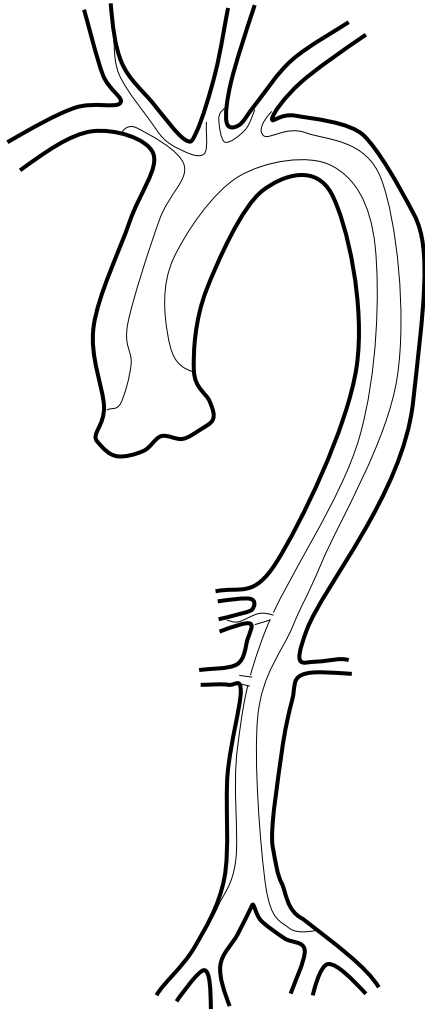
Geriatric Nutritional Risk Index (GNRI)

$GNRI = 14.89 \times \text{alb (g/dL)} + 41.7 \times \text{BW (kg)} / \text{ideal BW (kg)}$

GNRI < 92 : 170 Patients (29.5%)

GNRI \geq 92 : 410 Patients (70.5%)

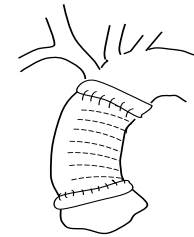
Surgical procedure



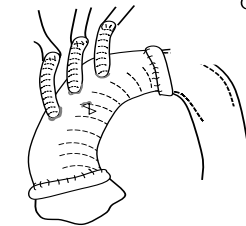
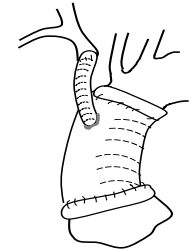
“Tear-oriented surgery”
we performed an acute aortic dissection repair using a HAR (or PAR) with an intimal tear exclusion to reduce in-hospital mortality and morbidity in patients older than 70 years.



Hemiarch



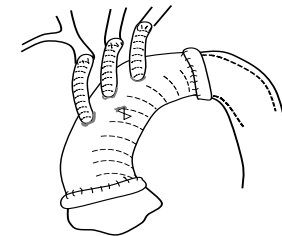
Partial arch



Total arch replacement

TAR was applied in condition described below if patients' condition was permitted

- Younger patients
- Connective tissue disorder
- Severe dissection involving supra-aortic orifices
- Enlarged aortic arch



Total arch replacement

Patient Characteristics



	GNRI \geq 92 (n = 410)	GNRI< 92 (n = 170)	P Value
Age (y)	66.01 \pm 11.9	74.57 \pm 10.5	<0.0001
Gender: Male	233 (56.8%)	55 (32.3%)	<0.0001
Hypertension	270 (65.9%)	99 (58.2%)	0.08
Diabetes mellitus	8 (4.7%)	28 (6.8%)	0.33
Coronary artery disease	11 (6.5%)	19 (4.6%)	0.36
Hemodialysis	6 (3.5%)	8 (2.0%)	0.26
Connective tissue disease	6(3.5%)	7 (1.7%)	0.18
Prior cardiac surgery	7 (4.1%)	12 (2.9%)	0.47
Preoperative ADL independence	402 (98%)	157 (92.4%)	0.008

	GNRI \geq 92 (n = 410)	GNRI< 92 (n = 170)	P Value
Shock	72(17.6%)	17 (28.2%)	0.004
Cardiopulmonary resuscitation	17(4.2%)	13 (7.7%)	0.083
Cardiac tamponade	58 (14.1%)	51 (30.0%)	<0.0001
Coma	11 (2.7%)	5 (2.9%)	0.86
Malperfusion	164 (40.0%)	47 (27.7%)	0.0049
Albumin (g/dl)	3.81 \pm 0.37	3.16 \pm 0.44	<0.0001
hemoglobin (g/dl)	13.5 \pm 6.65	11.4 \pm 1.69	<0.0001
eGFR	59.5 \pm 22.3	56.2 \pm 22.9	0.11
BW (kg)	64.8 \pm 13.6	50.3 \pm 9.38	<0.0001
BMI	24.7 \pm 4.02	20.4 \pm 0.21	<0.0001

Surgical details



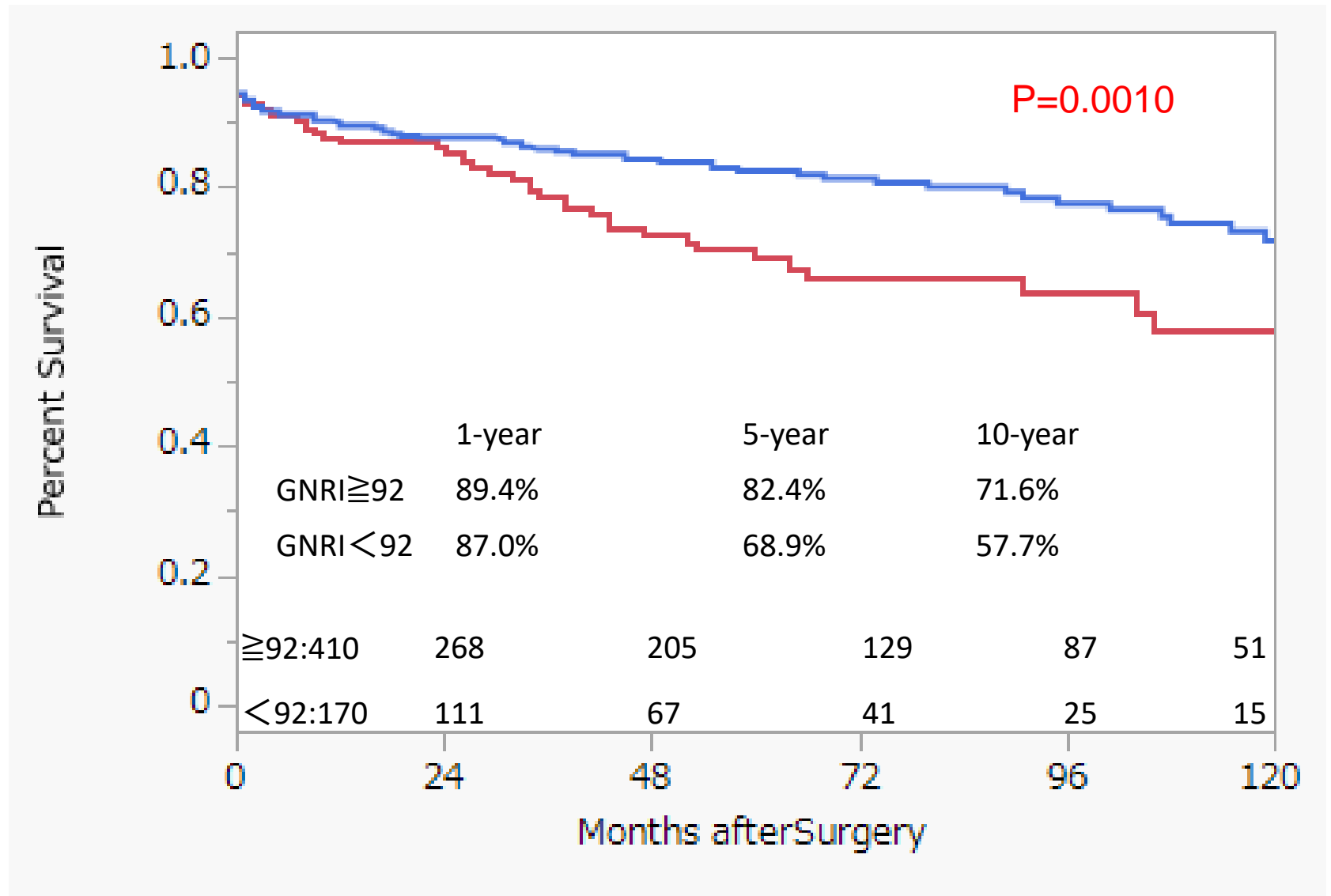
	GNRI\geq 92 (n = 410)	GNRI < 92 (n = 170)	P Value
Operation time (min)	513.2 \pm 195.1	450.0 \pm 164.5	0.002
Cardiopulmonary bypass time (min)	274.6 \pm 100.6	237.3 \pm 90.5	<0.0001
Myocardial ischemia time (min)	160.0 \pm 62.4	146.2 \pm 57.5	0.014
Selective cerebral perfusion time (min)	156.3 \pm 124.0	106.8 \pm 74.7	<0.001
Circulatory arrest time (min)	75.0 \pm 35.3	69.6 \pm 35.6	0.098
Lowest body temperature ($^{\circ}$ C)	25.4 \pm 2.58	25.5 \pm 2.69	0.63
Resection of the intimal tear	381 (92.9%)	165 (97.1%)	0.053
Total arch replacement	217 (52.9%)	39 (22.9%)	
Partial arch replacement	20 (4.9%)	12 (7.1%)	
Hemi arch replacement	173 (42.2%)	119 (70.0%)	<0.0001
Concomitant Procedure	83 (20.2%)	27 (15.9%)	0.22

Postoperative data

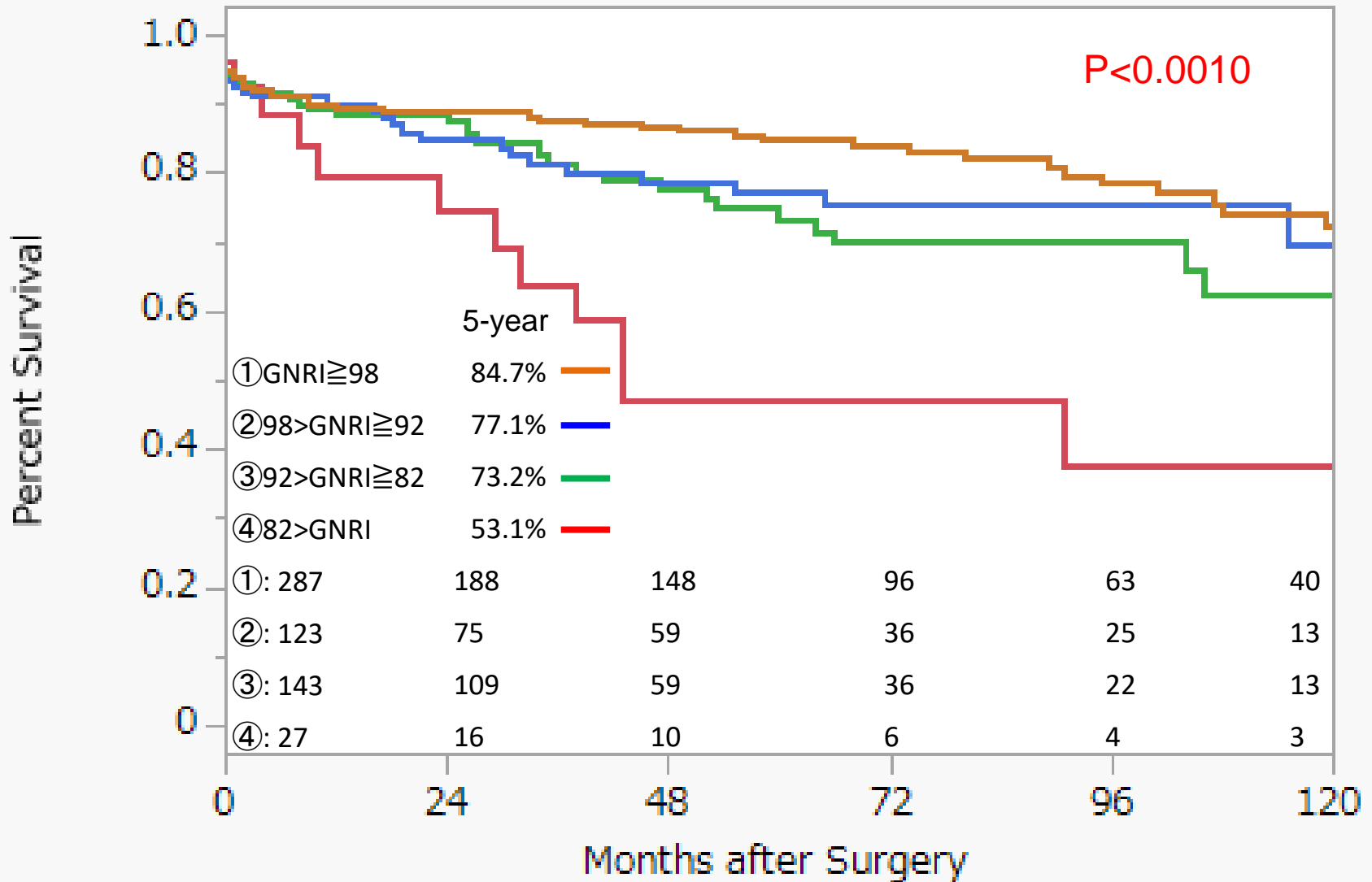


	GNRI ≥ 92 (n = 410)	GNRI < 92 (n = 170)	P Value
Hospital mortality	33 (8.7%)	12 (7.1%)	0.69
Renal failure requiring hemofiltration	43 (10.5%)	7 (4.1%)	0.012
Re-exploration	27 (6.6%)	10 (5.9%)	0.75
Tracheostomy	33 (8.1%)	10 (5.9%)	0.36
Transient neurologic deficit	(3.4%)	4 (2.4%)	0.5
Permanent neurologic deficit	42 (10.2%)	13 (7.7%)	0.33
Prolong mechanical ventilation time (48h)	183 (44.6%)	55 (32.4%)	0.006
Intensive care unit stay (day)	8.6±11.4	7.7±12.8	0.41
Hospital stay (day)	36.7±31.9	31.8±26.1	0.08
Transfer to rehabilitation Hospital	131 (32.0%)	70 (41.2%)	0.036

Overall survival



Overall survival



Independent postoperative predictors of late mortality



	Univariate			Multivariate		
	OR	95%CI	p value	OR	95%CI	P value
Age > 80	1.87	1.25-2.81	0.0021	1.85	1.19-2.87	0.0064
Previous cardiac surgery	2.83	1.11-4.67	0.020	2.39	1.13-5.05	0.022
HD	2.64	1.15-6.01	0.020			
eGFR < 30	8.30	2.31-28.1	0.0020			
GNRI ≥ 92	1.77	1.25-2.51	0.0012	1.47	1.00-2.17	0.049
Coma	4.07	2.04-8.11	0.03			
myocardial malperfuion	3.61	2.14-6.11	<.0001	2.85	1.55-5.21	0.0007
Visceral malperfusion	2.94	1.43-6.03	0.0033	2.92	1.30-6.28	0.0060
Shock	2.22	1.55-3.17	<.0001			
Cardiopulmonary resuscitation	5.70	3.46-9.38	<.0001	3.54	1.75-7.18	0.0004
Persistent neurological deficits	2.35	1.44-3.83	0.0006			

Conclusion



- Preoperative assessment of nutritional status using GNRI is an independent factor in the long-term prognosis of acute aortic dissection.
- This assessment method is simple to perform preoperatively and may provide useful information for predicting the postoperative mortality and morbidity in elderly patients.