

The Availability of Pre-operative Geriatric Nutritional Risk Index (GNRI) in Kidney Transplant Recipients.

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BACKGROUND

- Malnutrition is a prevalent condition in chronic dialysis patients and seems to be a risk factor for mortality.
- The clinical significance of nutritional assessments in pre-operative kidney transplant recipients has not been elucidated sufficiently.
- We hypothesized that pre-operative nutritional assessment might predict renal and systemic conditions after kidney transplantation (Tx).

METHODs

Patient Population

All subject's kidney transplant recipients were 18 years or older and were followed up at our center from July 2007 to June 2011. Their clinical courses were retrospectively surveyed for 12 months after transplantation.

Data Collection

Most blood samples were collected at predialysis time just before transplantation.

Statistical Analysis

Wilcoxon rank sum test, Mann-Whitney test and logistic regression analysis were used to analyze the data.

NUTRITIONAL RISK SCORING

Geriatric nutritional risk index(GNRI)

$$= 1.489 \times \text{albumin (g/dL)} + 41.7 \times \text{body weight / ideal body weight}$$

Patients are divided with pre-transplant GNRI into Low-GNRI (GNRI < 99) and High-GNRI group (GNRI ≥ 99).

	PreTx GNRI < 99 (Low-GNRI)	PreTx GNRI ≥ 99 (High-GNRI)	P
Number	22	23	
Men (%)	72.3	69.6	0.870
Age (y)	45.36±11.01	43.43±10.01	0.256
HD (%)	81.8	95.7	0.140
Previous dialysis period (y)	7.0±7.2	6.34±6.45	0.238
Presence of DM (%)	1.88	26.1	0.271
Living donor Tx (%)	81.8	73.9	0.780
ABO incompatible Tx (%)	36.4	17.4	0.639
GNRI	91.53±6.49	106.73±6.42	0.0000003*
BMI	20.24±2.28	23.17±3.18	0.0037*
Hb (g/dL)	10.76±1.5	11.56±1.12	0.052
T-CHO (mg/dL)	150.27±26.47	171.91±42.33	0.019*
Alb (g/dL)	3.57±0.41	4.21±0.37	0.00003*
HgA1c (%)	5.17±0.48	5.44±1.34	0.442
CRP (mg/dL)	0.51±0.88	0.11±0.22	0.009*
i-PTH (pg/mL)	183.79±219.02	266.79±179.47	0.028*

Table 1. Baseline Characteristics at the time of Transplantation

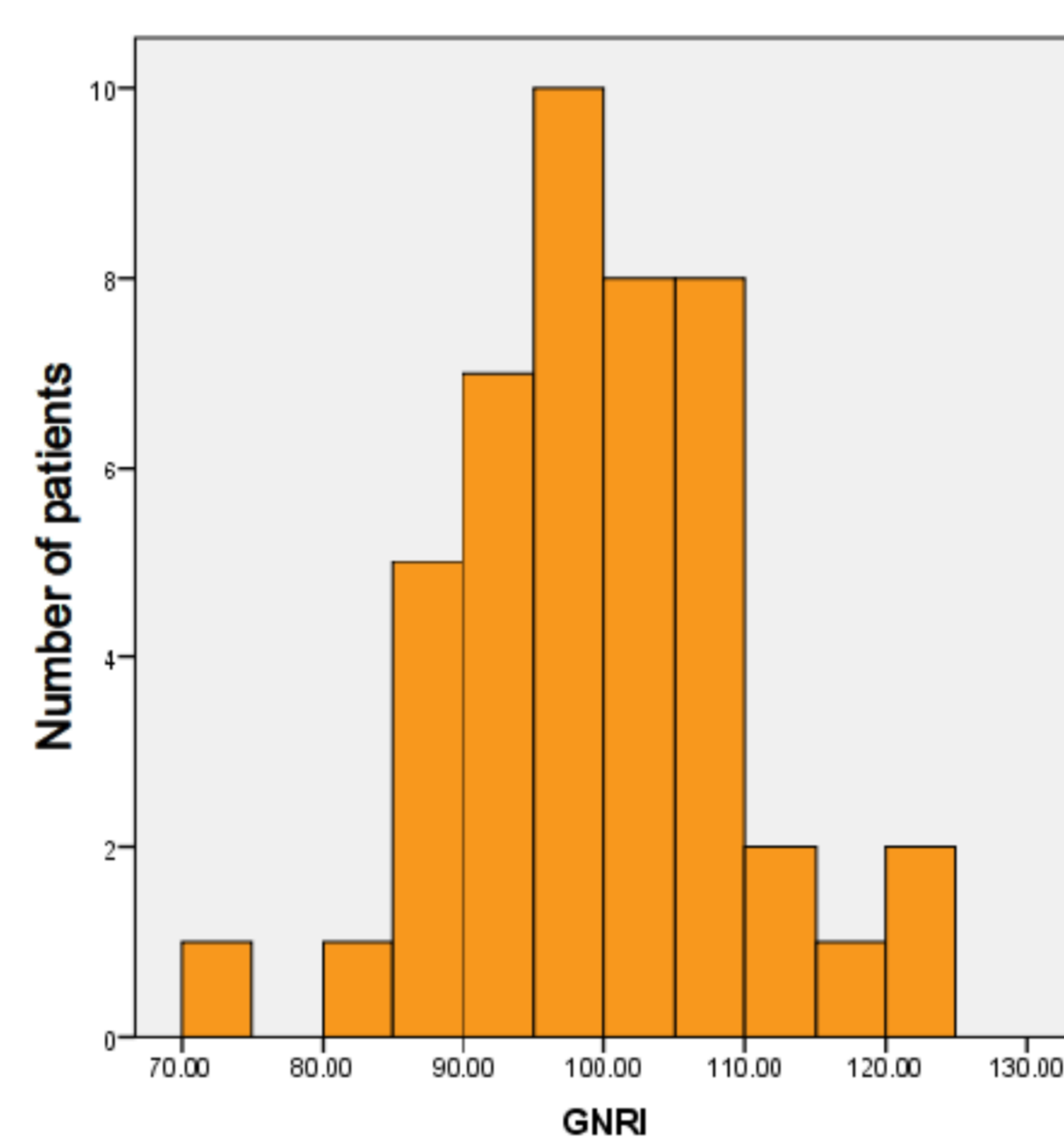


Fig1. Distribution of PreTx Geriatric Nutritional Risk Index (GNRI).

PreTx Low-GNRI Group

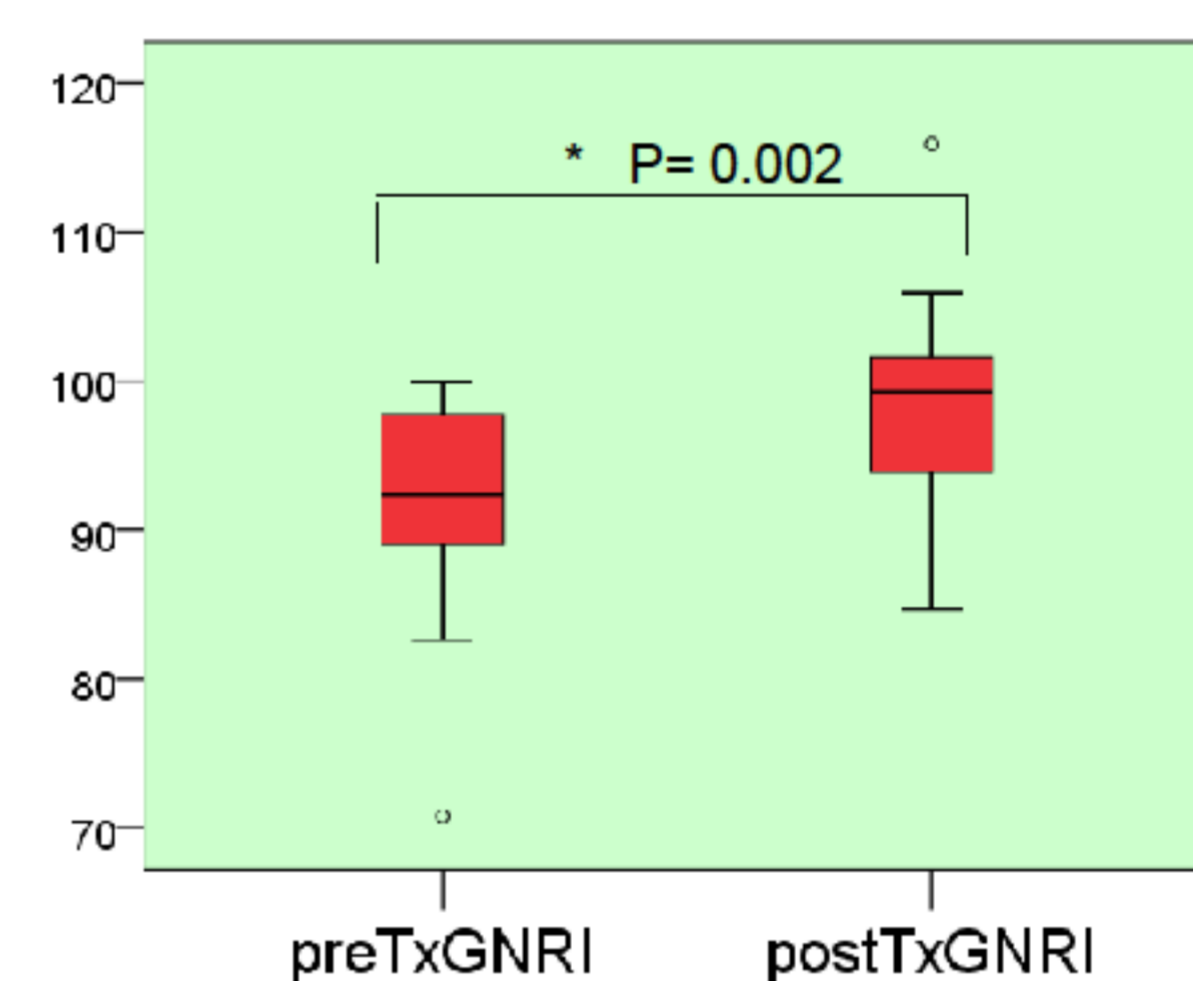


Fig 2. Low GNRI patients show significant recovery in nutrition status 1-year after Tx.

PreTx High-GNRI Group

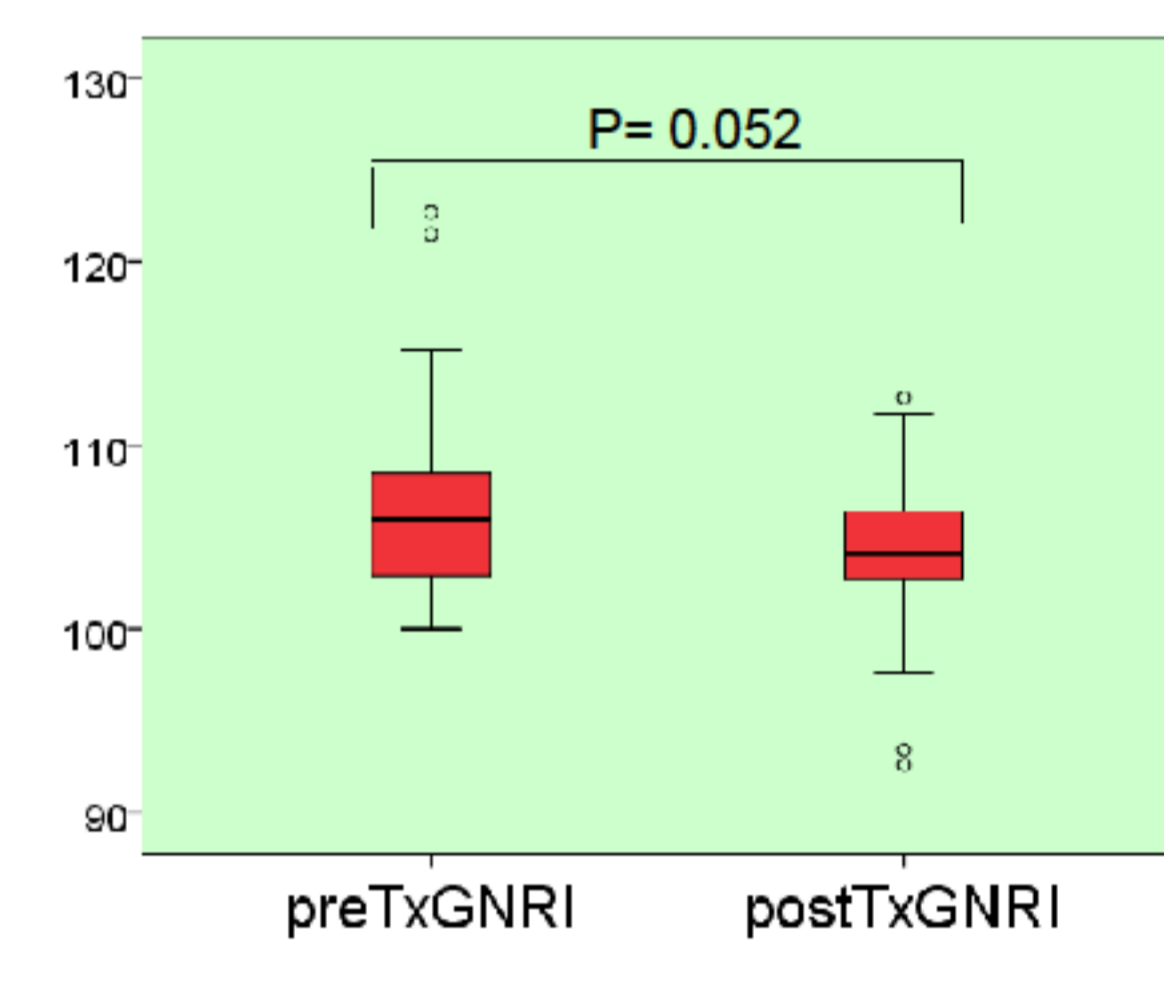


Fig 3. High GNRI patients show no nutritional recovery 1-year after Tx.

PreTx Low-GNRI Group

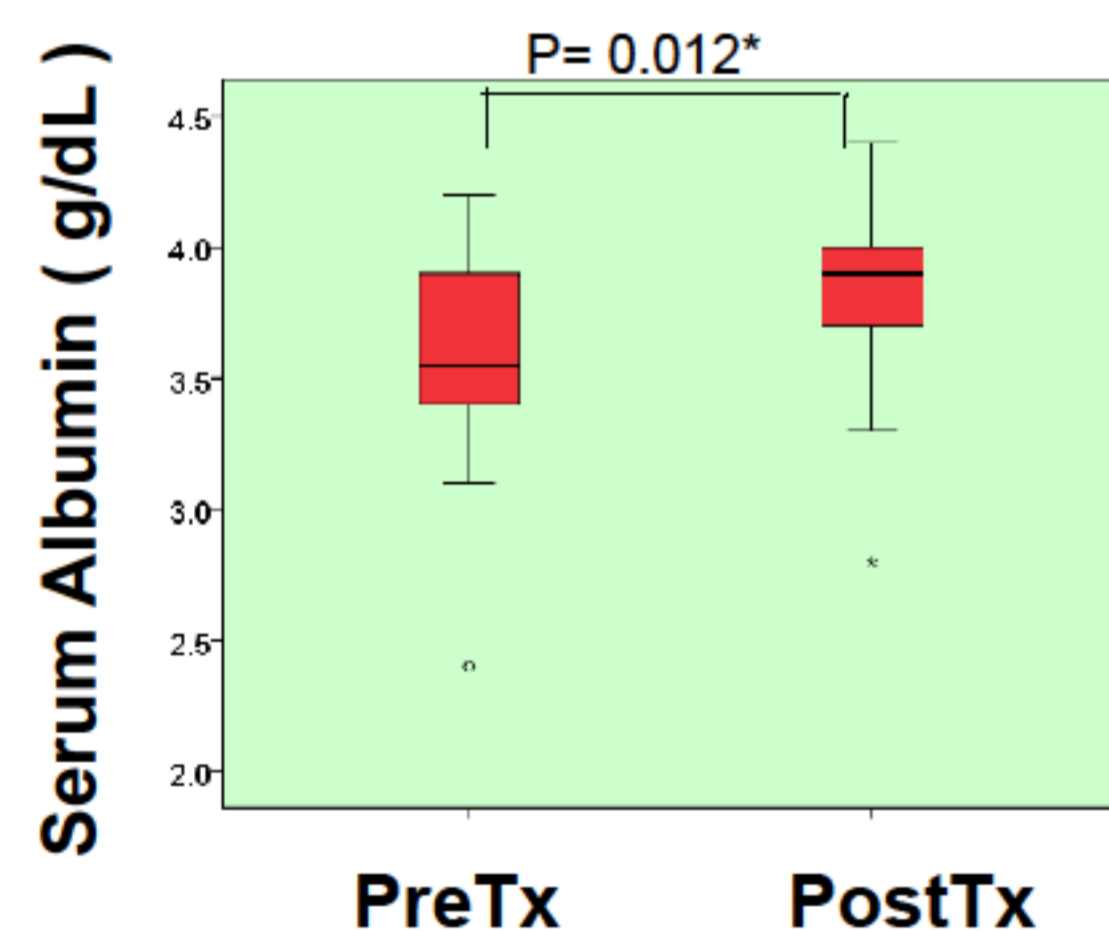


Fig 4. Low GNRI patients show significant recovery in serum albumin at 1-year after Tx.

PreTx High-GNRI Group

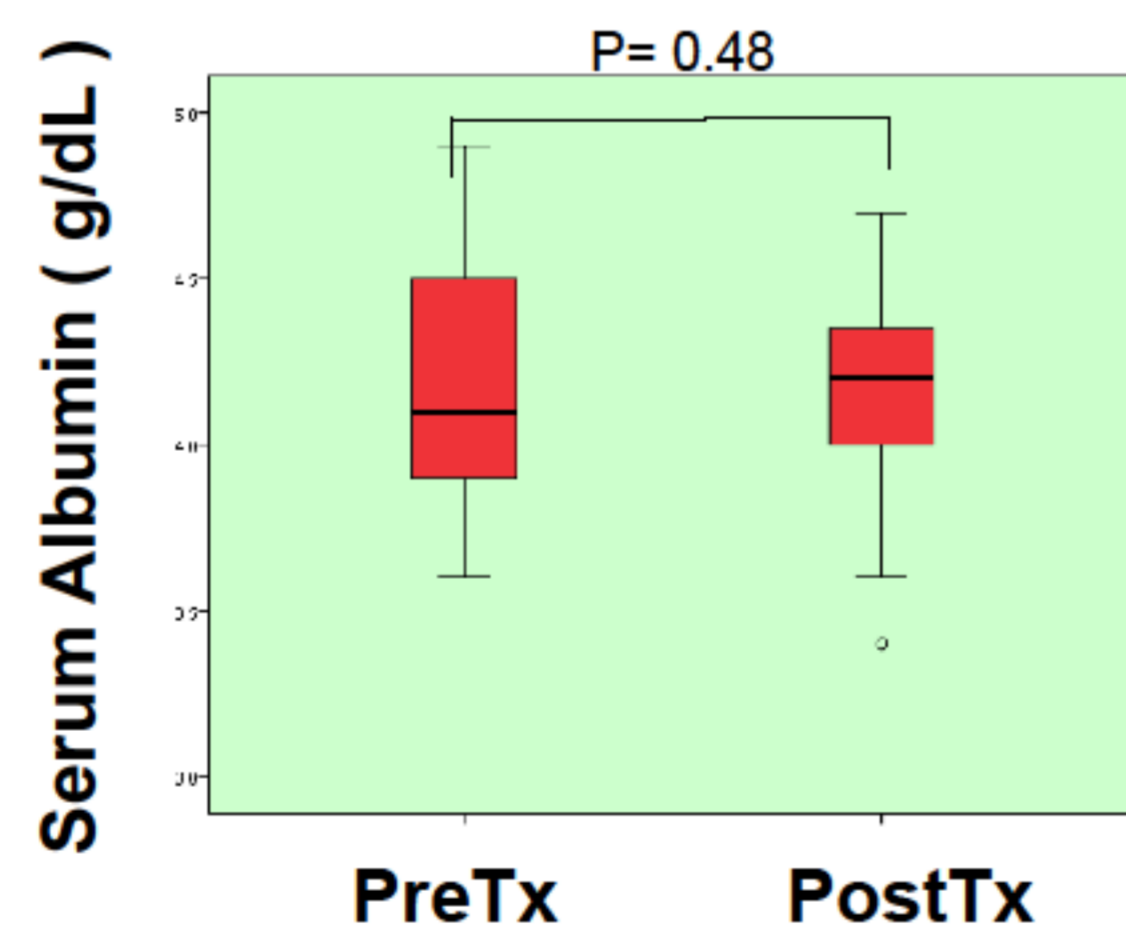


Fig 5 High GNRI patients show no significant change of serum albumin at 1-year after Tx.

	PreTx Low-GNRI	PostTx High-GNRI	P-value
Graft failure	0 %	4.3 %	1.0
DGF	9.1 %	4.3 %	0.608
Death	0 %	0 %	1.0
Infection	36.4 %	30.4 %	0.916
Cardiovascular event	4.5 %	4.3 %	0.489
Wound complications	0 %	0 %	1.0
New onset DM / impaired glucose metabolism	70 %	27.8 %	0.033*

Table 2. Complications following kidney transplantation by preTx GNRI category.

Odds Ratio of New Onset DM / IGM

	Odds ratio (95% CI)	P-value
PreTx Low-GNRI	5.60 (1.360 – 23.059)	0.035*
Male	3.75 (0.89 – 15.808)	0.139
Tacrolimus (vs Cyclosporin A)	0.77 (0.648 – 23.693)	0.428
mPSL > 4 mg/day at 1-year after Tx	2.0 (0.317 – 12.619)	0.768
BMI < 22	1.719 (0.468 – 6.316)	0.629
Pre Tx Alb < 4.0 g/dL	1.389 (0.381 – 5.067)	0.868
Pre Tx HOMA-IR > 1.6	1.653 (0.588 – 4.649)	0.565

Table 3. Odds ratio (and 95% confidence intervals) for postTx impaired glucose metabolism. PreTx Low-GNRI was statistically associated with impaired glucose metabolism.(IGM)

RESULTS

- A significant improvement of GNRI and serum albumin were noted in Low-GNRI group at 1-year after transplantation, respectively (P<0.05).
- The impaired glucose metabolism emerged at a significantly higher rate in the patients with PreTx Low-GNRI (P<0.05).
- There were no significant relationship between PreTx GNRI and the episodes of post-operative complications such as DGF, graft loss, infection, and cardiovascular events.

CONCLUSIONS

PreTx GNRI is available for the pre and post-transplant nutritional evaluation and expected to be a predictive marker for new onset DM (NODAT) and new onset impaired glucose metabolism after Tx.

REFERENCES:

Clin J Am Soc Nephrol 8: 443–451, 2013
Nephrol Dial Transplant 25: 3361–3365, 2010
Am J Transplant. 11(5): 1006–1015, 2011

