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Perioperative day to day glucose variability and post-transplant diabetes mellitus in non-diabetic kidney transplantation patients

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Objectives:

Post-transplant diabetes mellitus (PTDM) is a problem that may affect the function and prognosis of the transplanted kidney, but early predictive markers are not yet revealed clear. Recent studies have reported that glucose variability in normal population is associated with the development of type 2 diabetes mellitus. In this study, we tried to find out the relationship between perioperative glucose variability and PTDM risk in non-diabetic kidney transplantation patients.

Methods: A retrospective cohort study was performed using KT data collected between July 2005 and May 2018 at single institution. Among 1866 patients, re-transplantation, age under 18 years, diabetic patients and patients with acute rejection within 7 days were excluded and total 1[kBS1] 255 patients were analyzed. Mean of daily difference (MODD) was calculated using fasting serum glucose from the day of surgery to the day 7 after surgery. Patients were divided into normal MODD and high MODD group by cut off value of 18.196 mg/dL. Primary endpoint was occurrence of PTDM and secondary endpoint was occurrence of acute rejection within 1 year after transplantation.

Results:

The mean age of patients was 44.13 (11.74) years and 56.3% were male. The high MODD group was composed of 221 (17.6%) patients. The incidence of acute rejection within 1 year did not differ between two groups (6.5% versus 8.6%; P value 0.09) but the incident rate of PTDM was significantly higher in the high MODD group (7.7%) than the normal MODD group (3.4%). The logistic regression model and 1:2 propensity score-adjusted models consistently demonstrated that the high MODD group was at a high risk of PTDM (odds ratio 2.57, 95% confidence interval 1.20-5.58 in 1:2 propensity matching analysis).

Conclusions: The occurrence of PTDM was more prominent in high MODD group in non-diabetic kidney transplantation patients.

Figure1.Patients selection

Figure 1. Patients selection for this study

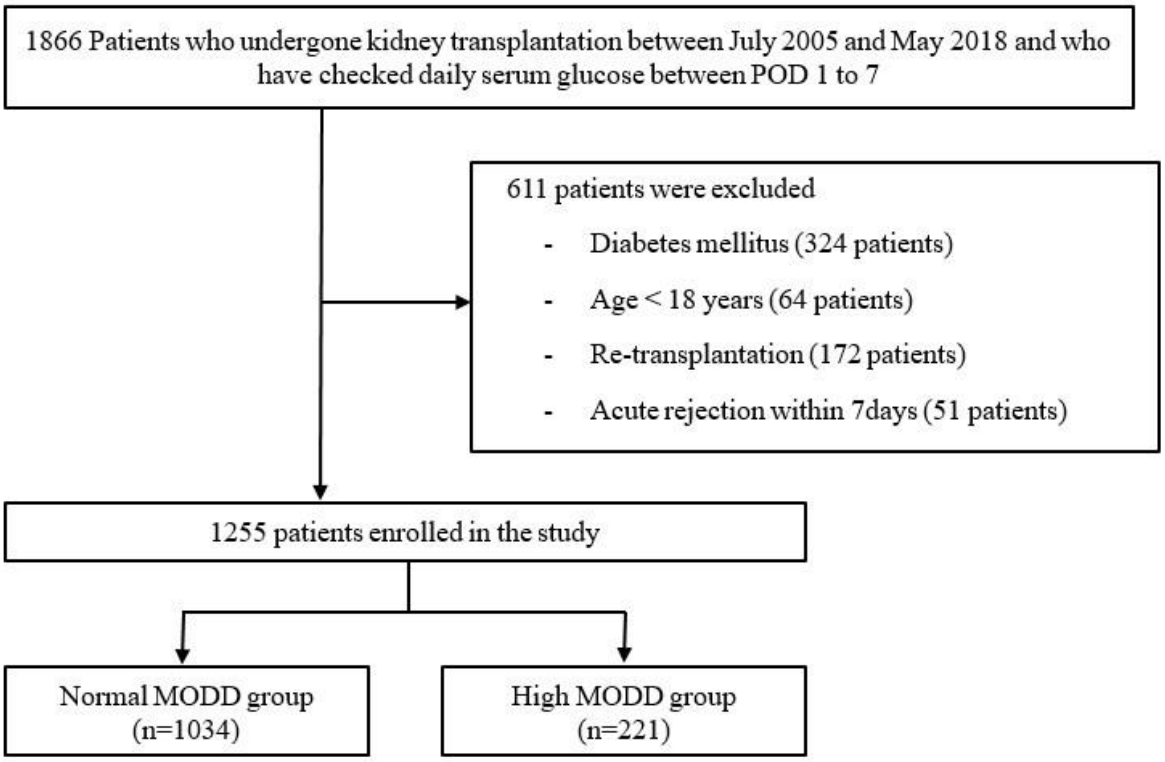

Table3.Occurrence of PTDM by groups

Table 3. Occurrence of PTDM for normal MODD group vs high MODD group

	OR	95% CI	*P*
Unadjusted model	2.38	1.28 – 4.27	0.005
Multivariable-adjusted model†	2.39	1.23 – 4.50	0.008
Propensity score Matching 1:2*	2.75	1.32 – 5.88	0.008
Multivariable regression with Matching†*	2.57	1.20 – 5.58	0.015

OR = odds ratio; CI = confidence interval; MODD = mean of daily difference.

†Multivariable adjusted model adjusted by glucose level, donor type, donor age and recipient age.
*The Propensity score of high MODD group was estimated using a multivariate logistic regression model, which included recipient age, recipient sex, donor age, donor sex, donor type, hypertension, HLA mismatch, ABO mismatch and glucose level.