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Detecting High Risk Patients for NODAT after Kidney Transplantation using Continuous Glucose Monitoring Device

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Introduction: Perioperative hyperglycemia is common in kidney transplantation and is associated with not only renal allograft outcomes, but also increased risks for development of new-onset diabetes after transplantation (NODAT). The purpose of this study was to identify risk factors associated with NODAT using perioperative continuous glucose monitoring.

Methods: A prospective observational study starting May 1st, 2021 was conducted for patients who underwent living donor kidney transplantation. Upon enrollment, a CGM system was applied and CGM was undertaken 2 weeks preoperatively and 2 weeks postoperatively. No additional interventions were undertaken. Clinical characteristics and transplant related outcomes were collected along with glucose profile using the CGM system.

Results: A total of 99 patients were enrolled in the study and completion of both preoperative and postoperative CGM was accomplished in 69 patients. Excluding 13 patients with underlying diabetes, 11 (15.9%) patients developed NODAT and 45 (65.2%) patients did not (nonNODAT). The underlying characteristics of patients that developed NODAT compared to nonNODAT were older (56.79.3 vs. 46.012.9; $p=0.016$), more likely male (90% vs. 45.7%; $p=0.013$), and had younger kidney donors (41.411.3 vs. 50.812.3; $p=0.031$). There was no difference in preoperative glucose profile using CGM, however NODAT patients had higher baseline HbA1c (5.550.48 vs. 5.160.37; $p=0.022$), and lower baseline HDL levels (37.9012.21 vs. 50.8916.68; $p=0.024$). The postoperative CGM showed higher mean glucose levels (138.9122.04 vs. 120.4818.40; $p=0.006$), higher daily peak glucose levels (167.9327.52mg/dL vs. 115.9019.58mg/dL; $p=0.001$), and longer time above glucose level of 250mg/dL (17.279.6% vs. 8.347.57%; $p=0.002$).

Conclusion: Despite the normal ranges of serum glucose levels or HbA1c, kidney transplant patients who develop NODAT have significantly higher preoperative HbA1c and postoperative glucose levels than those who do not.