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Editorial
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New Onset Diabetes Mellitus after Kidney Transplantation

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Editorial

New-onset diabetes after transplantation (NODAT) is one of the most common complications following kidney transplantation. It is known that the risk of diabetes is increased following kidney transplantation. Several studies have shown that the most important risk factors of NODAT are immunosuppressive drugs, family history, body weight, and body mass index (BMI) of the recipient also have their role. Several clinical studies evaluated the diabetogenic effect of the immunosuppressive drugs calcineurin inhibitor (cyclosporine-A, tacrolimus) [1-3].

The cardiovascular risk of kidney transplant patients may be decreased, and the long-term survival of the graft may be increased by the timely recognition and treatment of diabetes. Thorough risk assessment should have an important role in choosing the immunosuppressive therapy [4-6]. If the risk of diabetes is already high before the transplantation, we should avoid the use of tacrolimus. The exact mechanism of calcineurin inhibitor induced toxicity to β cell is unknown. The diabetogenic effect of tacrolimus may be reversible, as evidenced by observations that impaired insulin secretion was reversed 3 days after tacrolimus discontinuation, and insulin secretion improved after the reduction of tacrolimus through blood concentration.

Treatments of diabetes mellitus are primarily lifestyle modifications, but if adequate glycemic control is failed to be achieved, medical intervention is recommended because it is shown to reduce the risk for developing diabetic complications, it is recommended to quit smoking, decrease alcohol consumption, increase physical activity and reach the ideal body weight [3,4,7-9]. Later, in case of a worsening glucose metabolism, a reduction in the dose of the calcineurin inhibitor and even a switch to a calcineurin inhibitor-free combination may be considered. Orally administered agents can be used either alone or in combination with other oral agents or insulin. Although oral hypoglycemic agents may be effective in many patients with corticosteroids, cyclosporine-A or tacrlimus - induced NODAT, insulin therapy may ultimately be necessary in up to 25% of the patients, particularly in the early post-transplant period [10-13]. Metform in is the preferred agent for overweight patients; its use should be avoided with impaired allograft function due to the possibility of lactic acidosis. Care should also be taken when sulfonylurea derivatives are prescribed to patients with impaired allograft function or to elderly patients due to increased risk of hypoglycemia [5,7,8,14]. The "non-sulfonylureas" meglitinides are insulin secretagogues with a mechanism of action similar to that of the sulfonylureas [15]. Nonetheless, they have a more rapid onset and shorter duration of action and seemingly lower risks of hypoglycemia and the amount of weight gain is lower. Thiazolidinedione derivatives are insulin sensitizers that may allow for a reduction in insulin requirement. The incidence of peripheral edema is increased when thiazolidinedione derivatives are used in combination with insulin. The success of treatment of diabetes is enhanced by frequent contact between the patients and their physicians. If the target values cannot be achieved, blood glucose levels should be set with the help of a consultant internist.

Follow-up can occur at the clinic of the transplantation center by the community nephrologist and diabetologist with experience in the care of transplant recipients. We are not only able to preserve the allograft function, but we may also increase the survival of the patients.

References

1. Ojo AO. Cardiovascular complications after renal transplantation and their prevention. Transplantation. 2006;82(15): 603-11.

2. Borda B, Szederkényi E, Lengyel C, Morvay Z, Eller J, Marofka F, et al. Functional and histopathological changes in renal transplant patients with new-onset diabetes and dyslipidemia. Transplant Proc. 2011;43:1254-8.

3. Kaminska D, Bernat B, Mazanowska O, Krasnowski R, Polak W, Patrzalek D, et al. Predictive value of Banff score of early kidney allograft biopsies for 1-year graft survival. Transplant Proc. 2006;38:59-61.

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4. Borda B, Lengyel C, Szederkényi E, Eller J, Keresztes C, Lázár G. Post-transplant diabetes mellitus: risk factors and effects on the function and morphology of the allograft. Acta Physiologica Hungarica. 2012;99(2):206-15.

5. Valderhang TG, Jenssen T, Hartmann A, Midtvedt K, Holdaas H, Reisaeter AV, et al. Fasting plasma glucose and glycosylated hemoglobin in the screening for diabetes mellitus after renal transplantation. Transplantation. 2009;88(3):429-34.

6. Kamar N, Mariat C, Delahousse M, Dantal J, Al Najjar A, Cassuto E, et al. Diabetes mellitus after kidney transplantation a French multicentre observational study. Nephrol Dial Transplant. 2007;22(17):1986-93.

7. Helanterä I, Ortiz F, Räisänen-Sokolowski A, Koskinen P. Impact of glucose metabolism abnormalities on histopathological changes in kidney transplant protocol biopsies. Transpl Int. 2010;23(4):374-81.

8. Shah T, Kasravi A, Huang E, Rick H, Brian Y, Yong W, et al. Risk factors for development of new-onset diabetes mellitus after kidney transplantation. Transplantation. 2006;82:1673-6.

9. Borda B, Lengyel CS, Várkonyi T, Kemény E, Ottlakán A, Kubik A, et al. Side effects of the calcineurin inhibitor – such as – new onset diabetes after kidney transplantation. Acta Physiol Hung. 2014;101(3):388-94.

10. Ossareh S, Nassem S, Faraj MA, Bahrami Al M, Yousefnejad A. Frequency and risk factors for post transplant diabetes mellitus in Iranian renal transplant patients. Transplant Proc. 2009;41(7):2814-6.

11. Lentine KL, Rocca-Rey AL, Bacchi G, Wasi N, Schmitz L, Salvalaggio PR, et al. Obesity and cardiac risk after kidney transplantation: Experience at one center and comprehensive literature review. Transplantation. 2008;86(2):303-12.

12. Ciancio G, Burke GW, Gaynor JJ, Ruiz P, Roth D, Kupin W, et al. A randomized long-term trial of tacrolimus/sirolimus versus tacrolimus/mycophenolate versus cyclosporin/sirolimus in renal transplantation: three-year analysis. Transplantation. 2006;81(6):845-52.

13. Gallon LG, Winoto J, Leventhal RJ, Parker MA, Kaufman DB. Effect of prednisone versus no prednisone as part of maintenance immuno suppression on long-term renal transplant function. Clin J Am Soc Nephrol. 2006;1(5):907-8.

14. Borda B, Munir Ibrahim Y, Lengyel C, Várkonyi T, Kubik A, Keresztes C. Early histopathological changes in new onset diabetes after kidney transplantation. Transplant Proc. 2014;46:2155-9.

15. Cheng AY, Fantus IG. Oral anti hyperglycemic therapy for type 2 diabetes mellitus. CMAJ. 2005;172(2):213-26.