



Original article

The incidence of new onset diabetes after transplantation and related factors: Single center experience

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ARTICLE INFO

Article history:

Received 15 July 2015

Accepted 17 November 2016

Available online xxx

Keywords:

PTDM

Renal transplantation

Impaired fasting glucose

ABSTRACT

Aim: New-onset diabetes after transplantation (NODAT) is a frequent metabolic complication and is considered a risk factor for patients undergoing renal transplant. The aim of this study was to evaluate the incidence and developing duration of new-onset diabetes after transplant (NODAT) and influencing factors.

Methods: All patients' data was investigated retrospectively. Diabetics, follow-up period < 6 months, age < 18 years were excluded. Demographic, clinical and laboratory data was recorded. Patients were divided into two groups: with/without NODAT. NODAT group was divided into four subgroups according to the time of developing NODAT, which were 0–3, 3–6, 6–12 and 12 months later. Two groups were compared, to investigate the incidence of NODAT and risk factors associated with the occurrence of NODAT.

Results: We retrospectively analyzed the records of 570 patients, of which 420 patients were included. Seventy (16.6%) patients had NODAT (36 female, mean age 51.7 ± 8.2 years, mean follow-up 41.6 ± 21.5 months), 52.8% of patients developed NODAT within the first three months of being diagnosed. 350 patients (116 female, mean age 43.2 ± 12.5 years, mean follow-up 41.6 ± 21.5 months) were without NODAT. The incidence of impaired fasting glucose (IFG) during the first week after transplant was found to be higher in the patients with NODAT ($p < 0.001$). There was positive correlation between NODAT and older age, obesity, family history of diabetes, presence of IFG, fasting plasma glucose, total and LDL-cholesterol, triglycerides, parathormone. Old age, obesity, presence of IFG, pretransplant hypertriglyceridemia and hyperparathyroidism were predictors of development of NODAT.

Conclusion: Incidence of NODAT, especially the first six months, was high. All patients should be screened for IFG within the first week. Patients with dyslipidemia, elderly and obese patients should be closely monitored for the risk of development of NODAT.

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<http://dx.doi.org/10.1016/j.nefro.2016.11.022>

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Incidencia de diabetes postrasplante de nueva aparición y factores relacionados: experiencia de un único centro

R E S U M E N

Palabras clave:

DMPT
Trasplante renal
Alteración de la glucemia en ayunas

Objetivo: La diabetes postrasplante de nueva aparición (NODAT, *new-onset diabetes after transplantation*) es una complicación metabólica frecuente y se considera un factor de riesgo para los pacientes a los que se ha realizado un trasplante renal. El objetivo de este estudio fue evaluar la incidencia y la duración del desarrollo de NODAT y los factores que influyen en ello.

Métodos: Se estudiaron los datos de todos los pacientes de manera retrospectiva. Se excluyó a los diabéticos, a los pacientes con un período de seguimiento inferior a 6 meses y a aquellos con menos de 18 años. Se registraron los datos demográficos, clínicos y de laboratorio. Se dividió a los pacientes en 2 grupos: con/sin NODAT. El grupo con NODAT se dividió en 4 subgrupos de acuerdo con el momento en que desarrollaron NODAT, que fueron 0-3, 3-6, 6-12 y 12 meses más tarde. Se compararon los 2 grupos para analizar la incidencia de NODAT y los factores de riesgo asociados con la aparición de NODAT.

Resultados: Se analizaron retrospectivamente los registros de 570 pacientes, de los cuales se incluyó a 420 pacientes. Un total de 70 pacientes (16,6%) presentaron NODAT (36 mujeres, con media de edad de $51,7 \pm 8,2$ años y un seguimiento medio de $41,6 \pm 21,5$ meses). El 52,8% de los pacientes desarrollaron NODAT durante los 3 primeros meses tras el diagnóstico. Otros 350 pacientes (116 mujeres, con una media de edad de $43,2 \pm 12,5$ años y un seguimiento medio de $41,6 \pm 21,5$ meses) no presentaron NODAT. Se encontró que la incidencia de la alteración de la glucemia en ayunas (IFG, *impaired fasting glucose*) durante la primera semana después del trasplante fue mayor en los pacientes con NODAT ($p < 0,001$). Hubo correlación positiva entre NODAT y edad avanzada, obesidad, antecedentes familiares de diabetes, IFG, glucemia plasmática en ayunas, colesterol total y colesterol-LDL, triglicéridos y hormona paratiroidea. Edad avanzada, obesidad, IFG, hipertrigliceridemia e hiperparatiroidismo pretrasplante fueron factores predisponentes a desarrollar NODAT.

Conclusión: La incidencia de NODAT, especialmente durante los primeros 6 meses, fue alta. Se tuvo que examinar a todos los pacientes en busca de IFG durante la primera semana. Se debe controlar estrechamente el riesgo de desarrollar NODAT en pacientes con dislipidemia, ancianos y obesos.

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Introduction

The survival time of renal transplant recipients has gradually increased because of the improved survival rate during the perioperative period and enhancements in treatment with anti-rejection drugs¹⁻⁴; as a result, long-term complications and the quality of life of transplant recipients have recently received more attention.

Posttransplantation diabetes mellitus (PTDM) is a serious and frequent metabolic complication after a renal transplant and is officially considered a risk factor for patients undergoing renal transplantation.⁵ PTDM severely affects the quality of life and long-term survival rate of renal transplant recipients.⁶⁻⁹

Variable rates in the prevalence of PTDM after kidney transplantation were reported in many studies.^{10,11} Porrini et al.¹² reported the prevalence of PTDM was 27, 21, 21 and 30%, at 3, 12, 24 and 36 months, respectively.

The variation in the reported incidence may be due in part to the lack of a standard definition of the condition,

the duration of follow-up, the presence of both modifiable and non-modifiable risks factors, and the type of organ transplants.¹³

The aim of this study was to investigate the frequency of development of PTDM among the renal transplant patients in our center, to determine the characteristics of the patients with PTDM and the duration of PTDM diagnosis and to evaluate the risk factors for PTDM.

Materials and methods

Patients' characteristics

In this retrospective study, we included all adult kidney allograft recipients at the Division of Nephrology and the Transplantation Unit of Istanbul Bilim University, between February 2005 and February 2014. Exclusion criteria were known history of diabetes, age under 18 years at the time of transplantation, multiorgan transplantation, follow up

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