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Kidney function and metabolic variables before and after nephrectomy in kidney donors with or without overweight and obesity

*Sandra Gabriela Flores Rico, Eduardo Mancilla Urrea, Francisco E. Rodríguez Castellanos**

Departments of Nephrology and Renal Transplantation, National Institute of Cardiology Ignacio Chávez, Mexico City, Mexico

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ABSTRACT

Background: Kidney transplantation is the best therapeutic option for patients with end-stage renal disease. The current availability of deceased donor organs is inadequate, which has led to consider living donors with high body mass index.

Objective: To compare metabolic type variables, urinary protein excretion and kidney function at baseline and at follow up between donors with overweight or obesity and donors with normal body mass index.

Materials and methods: We recorded clinical and biochemical variables at the time of donation and during the last follow-up.

Results: 68 donors were included, with a mean age of 46.4 ± 13.5 years. The total population was divided into group 1 with body mass index ≥ 25 kg/m^2 and group 2 with body mass index <25 kg/m^2. The average follow-up was 115.2 ± 84.1 months. Age, triglycerides, proteinuria and body mass index were significantly higher in group 1 at baseline. At follow-up uric acid, cholesterol, glucose, proteinuria and body mass index were significantly higher in group 1. Group 1 showed a significantly greater decline in renal function compared to the decline observed in group 2.

Conclusion: Donors with higher body mass index showed higher values in metabolic variables before and after donation. Donors in group 1 had higher proteinuria and higher decline of renal function compared to donors with normal body mass index.

* *Corresponding author.*
E-mail address: eugencast@gmail.com (F.E. Rodríguez Castellanos).

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Función renal y variables metabólicas antes y después de nefrectomía en donadores renales con y sin sobrepeso y obesidad

Palabras clave:
Trasplante renal
Donador
Obesidad
Función renal
Síndrome metabólico

RESUMEN

Antecedentes: El trasplante renal es la mejor opción terapéutica para pacientes con enfermedad renal terminal; sin embargo, la disponibilidad actual de órganos de donador fallecido resulta insuficiente, lo que ha motivado aceptar donadores vivos con un índice de masa corporal elevado.

Objetivo: Comparar variables de tipo metabólico, la excreción urinaria de proteínas y la función renal en el momento de la donación y durante el seguimiento, entre donadores con sobrepeso u obesidad y donadores con índice de masa corporal normal.

Material y métodos: Se registraron variables clínicas y bioquímicas en el momento de la donación y durante la última consulta de seguimiento.

Resultados: Se incluyó a 68 donadores, con una edad promedio de 46,4 ± 13,5 años. La población total se dividió en grupo 1, con índice de masa corporal ≥ 25 kg/m^2, y grupo 2, con índice de masa corporal < 25 kg/m^2. El tiempo de seguimiento promedio fue de 115,2 ± 84,1 meses. La edad, los triglicéridos, la proteinuria y el índice de masa corporal fueron significativamente mayores en el grupo 1 en el momento basal. Al final del seguimiento, el ácido úrico, el colesterol, la glucosa, la proteinuria y el índice de masa corporal fueron significativamente mayores en el grupo 1. El grupo 1 mostró una caída significativamente mayor de la función renal en comparación con el descenso observado en el grupo 2.

Conclusión: Los donadores con mayor índice de masa corporal mostraron valores más altos en variables de tipo metabólico antes y después de la donación. Los donadores del grupo 1 tuvieron mayor proteinuria y mayor pérdida de función renal en comparación con donadores con índice de masa corporal normal.

Introduction

Kidney transplantation is the best therapeutic option for patients with end stage kidney disease; however the availability of organs from cadaveric donors is insufficient, which has lead to the use of organs from living kidney donors. The prevalence of kidney transplant from living kidney donors varies worldwide: 3.3% in Finland, 8% in France, 47% in the United Kingdom, 49.5% in USA and finally 80% in Japan [1]. The advantages from living kidney transplants are several, among them are: the possibility of performing an elective kidney transplant, ensuring an optimal status of health in the donor and the recipient, reduced incidence of delayed graft function and finally, the patient and allograft survivals are better with living kidney donation. Nevertheless for the donor, it is predicted that the glomerular filtration rate might fall in a period of ten to twenty years after the donation, although until now there is no longitudinal prospective study to prove this because of the difficulty in the follow up of the patients and the gathering of the information. For this reason most of the knowledge about the renal function in kidney donors comes from retrospective studies [2]. In general one of the main consequences of kidney donation is the abrupt reduction in kidney mass causing hyperfiltration which may be accompanied by increment of kidney size and intraglomerular pressure with kidney damage and low glomerular filtration rate lately, however the impact of other variables such as age, gender, blood pressure or body mass index has not been clear in the long term.

Because of the increase in the worldwide prevalence of overweight and obesity it has been necessary to change the donor's selection criteria including those with a body mass index above 30 kg/m^2.

In the last twenty years the prevalence of obesity has increased 15–30.5% in the adult population in the United States [3]. Today, sixty percent of patients with end stage kidney disease that receive a kidney allograft have overweight or obesity [4].

Obesity is the first modifiable risk factor for chronic kidney disease due to its association with diabetes and high blood pressure. Moreover, obesity by itself increases the risk for developing renal disease through several mechanisms [5].

At the National Institute of Cardiology in Mexico City an average of 40 kidney transplants per year are performed, of which about 50% are living related donors, 25% living unrelated donors and 25% deceased donors. In relation to selection criteria for a potential donor, a person with the following characteristics is considered eligible: BMI ≤30 kg/m^2, urinary protein excretion less than 200 mg/day and a measured or calculated GFR ≥80 ml/min, which remain valid and unchanged at the present time, with the exception of BMI, since in the last 5 years some donors with BMI >30 kg/m^2 have been included, considering each case individually and given the shortage of donors that we currently face.