



# Kidney Transplantation and Posttransplantation Diabetes: Nutritional Evaluation

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**P**ROPER NUTRITION is important for a healthy lifestyle after kidney transplantation. Long-term immunosuppression proffers an increased risk of cardiovascular disease and of posttransplantation diabetes.<sup>1-3</sup> The graft itself may be affected by the amount of dietary protein, by hyperlipidemia, and by hyperglycemia.<sup>4</sup> Obesity is present in 15% to 20% of patients at the time of transplantation. By 1 year after the transplantation the recipients display weight gains of 10% or more.<sup>5,6</sup> The prevalence posttransplantation diabetes in our center is 9.8% (1997), demanding careful attention to the nutritional and metabolic state of these individuals.

The purposes of this study were to evaluate a group of patients who have undergone kidney transplantation with posttransplantation diabetes according to their body mass index (BMI) when submitted to the first intervention and discern the most common nutritional errors among this group during a nutritional, therapeutic, and educational intervention.

## PATIENTS AND METHODS

A sample of 38 among 50 patients who underwent kidney transplantation with posttransplantation diabetes was analyzed for age (years), weight (kg), height (cm), BMI ( $\text{kg}/\text{m}^2$ ), meal number, and physical activity. The dietitian used clinical information, anthropometric data, nutritional history, and prescription of a suitable diet. The balanced and personalized nutrition plan varied between 1700 to 2000 Kcal distributed among the three most important and three interpolated meals.

## RESULTS

The 38 patients who underwent kidney transplantation with posttransplantation diabetes had a mean age of  $42.2 \pm 10.5$  years (range: 30 to 65 years) in men ( $n = 20$ ) and  $56.67 \pm 9.37$  years (range: 37 to 72 years) in women ( $n = 18$ ). Mean BMI were  $24.7 \pm 3.1 \text{ kg}/\text{m}^2$  in men and  $29.09 \pm 6.05 \text{ kg}/\text{m}^2$  in women, which corresponds to the overweight range according to the World Health Organization classification. From their nutritional history, we concluded that the average caloric consumption was  $2487.3 \pm 639.5$  Kcal for the men and  $2236.46 \pm 581.97$  Kcal for the women, including an average protein ingestion of  $20.1 \pm 3.0\%$  for men and  $19.89 \pm 3.72\%$  for women. The carbohydrate content

averaged  $49.1 \pm 9.7\%$  for men and  $45.67 \pm 6.61\%$  for women; the average fat  $32.8 \pm 8.4\%$  and  $34.78 \pm 6.18\%$ , respectively. All of the affected patients had sedentary lifestyles with a mean number of meals of three (breakfast, lunch, and a light dinner).

## DISCUSSION

The side effects of the immunosuppression drugs steroids, cyclosporine, tacrolimus, azathioprine, mycophenolate, and sirolimus lead to a gain in weight or obesity, which significantly increase morbidity and mortality in kidney transplant recipients.<sup>1-3</sup> The most important problems are hypertension, diabetes, hyperlipidemia, coronary artery disease and accelerated atherosclerosis. Obesity and diabetes are linked to certain cancers, including those of the colon, rectum, prostate, and breast.<sup>7</sup> Recommendations for diet in the immediate and long-term posttransplantation period are necessary.<sup>8-10</sup> The preliminary data presented herein is being followed by a second evaluation thus we cannot derive final conclusions about nutrition intervention. However, we did observe the common denominator in our sample to be a ponderal excess among females, with the most frequent nutritional error being a low number of meals, excessive use of proteins and fat, chiefly by the female group, as well as a sedentary lifestyle. Nutritional intervention is crucial for graft and patients survival.

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