

# CHANGES OF A BODY SHAPE INDEX IN KIDNEY TRANSPLANT RECIPIENTS WHO RECEIVED CALCINEURIN INHIBITOR BASED IMMUNOSUPPRESSIVE REGIMEN

Emel Isiktas Sayilar<sup>1</sup>, Alparslan Ersoy<sup>1</sup>, Aysegul Koc<sup>1</sup>, Deniz Sigirli<sup>2</sup>, Abdulmecit Yildiz<sup>1</sup>, Yavuz Ayar<sup>1</sup>, Canan Ersoy<sup>3</sup>

<sup>1</sup>Department of Nephrology, <sup>2</sup>Department of Biostatistics and <sup>3</sup>Department of Endocrinology and Metabolism, Uludag University Medical Faculty, Bursa, Turkey



## Introduction

Obesity is common after kidney transplantation (KT). Distribution of obesity is one of the major predictors of metabolic and cardiovascular diseases. The A Body Shape Index (ABSI) is a recently proposed measure that standardizes waist circumference (WC) to weight and height. Neck circumference (NC) is recently described as an index for upper body subcutaneous fat. WC and waist-to-height ratio (WHtR) appear to be better anthropometric measures of abdominal obesity than body mass index (BMI) and have stronger correlation with intraabdominal fat content and cardiometabolic risk factors. ABSI and waist-to-hip-to-height ratio (WHHR) are shown to be superior to BMI, WC or WHtR in predicting cardiovascular disease risk in the elderly. The novel measurements has not yet been investigated in transplant recipients. This study aimed to investigate changes in obesity indices of kidney recipients who used calcineurin inhibitors.

## Materials and Methods

This study included 133 consecutive patients underwent transplant between May 2010 and December 2013. The patients were divided into cyclosporin (CsA, n:62, 32 female, median age 45) and tacrolimus (Tac, n:71, 39 female, median age 39) groups. In all patients, body weight, BMI, body fat percentage, WC, hip circumference (HC), waist to hip ratio (WHR), WHtR, WHHR, ABSI, wrist circumference (WrC) and NC were measured before, on month 3, year 1 and year 2 after transplant.

## Results

The ratio of diabetics in CsA group was higher than Tac group (21% vs. 1.4%, p<0.001). The ratios of de novo diabetics (4.8% vs 12.7%) and hypertensives (29% vs 26.8%) were similar in the CsA and Tac groups, respectively. There was no significant differences in serum creatinine levels between CsA and Tac groups. The weights and BMIs of patients in both groups significantly increased up to 24<sup>th</sup> month from the 3<sup>rd</sup> month according to the preoperative values. There was no significant difference in weight gains at the 12<sup>th</sup> (4.62±6.9 vs. 4.13±6.1 kg) and 24<sup>th</sup> months (5.79±7.1 vs. 5.96±6.5 kg) between the CsA and Tac groups, respectively. The overweight and obese ratios in the CsA and Tac groups were comparable at baseline (27.4% vs. 39.5% and 6.5% vs. 5.6%), at 12<sup>th</sup> (37.3% vs. 36.1% and 16.9% vs. 13.1%) and 24<sup>th</sup> (27.5% vs. 43.2% and 17.5% vs. 16.2%) months, respectively. There was no significant difference in the percentage changes of BMI, fat percentage, WC, WHR, WHtR, WHHR, WrC and NC at 12<sup>th</sup> and 24<sup>th</sup> months between both groups. Although the abdominal obesity ratios in the CsA and Tac groups increased, the ratios were comparable in the preoperative (17.7% vs. 23.9%), after 12 (37.3% vs. 39.3%) and 24 (40% vs. 45.9%) months of transplantation, respectively. The ABSI values of both groups before transplant were comparable. ABSI increased in all months in CsA group except 12<sup>th</sup> month while it increased at the first 6 months in Tac group. The increases of ABSI in CsA group at 1<sup>st</sup> (4.8% vs. 2.7%, p=0.02) and 3<sup>rd</sup> (4.0% vs. 2.0%, p=0.018) months were significantly higher than those of Tac group for first three months.

**Table 1.** Effects of cyclosporin and tacrolimus treatments on anthropometric measurements in both groups

Measurements	CNI	Baseline	Month 3	Month 12	Month 24
Body mass index (kg/m <sup>2</sup> )	CsA	24.0±4.3	24.7±4.1 <sup>a</sup>	25.5±4.3 <sup>b</sup>	25.5±5.2 <sup>b</sup>
	Tac	23.7±4.7	24.5±4.2 <sup>a</sup>	25.1±4.6 <sup>b</sup>	25.8±4.5 <sup>b</sup>
Fat percentage (%)	CsA	23.2±7.7	24.7±8.6 <sup>c</sup>	25.2±9.1 <sup>c</sup>	25.0±8.9 <sup>c</sup>
	Tac	23.9±9.8	24.7±9.2	25.2±9.9	26.3±9.5 <sup>c</sup>
Waist circumference (cm)	CsA	85.4±10.8	90.6±11.3 <sup>b</sup>	90.4±13.2 <sup>b</sup>	90.5±14.4 <sup>b</sup>
	Tac	85.2±12.9	88.6±11.9 <sup>b</sup>	88.3±13.1 <sup>b</sup>	90.2±13.7 <sup>a</sup>
Hip circumference (cm)	CsA	93.7±9.8	97.4±8.9 <sup>b</sup>	99.9±9.5 <sup>b</sup>	100.6±10.3 <sup>b</sup>
	Tac	94.9±9.5	97.0±9.0 <sup>a</sup>	98.8±9.9 <sup>b</sup>	100.2±9.4 <sup>b</sup>
Waist-to-hip ratio	CsA	0.91±0.06	0.92±0.06 <sup>a</sup>	0.90±0.07	0.89±0.08
	Tac	0.89±0.08	0.91±0.06 <sup>a</sup>	0.89±0.07	0.89±0.07
Waist-to-height ratio	CsA	0.52±0.06	0.55±0.07 <sup>b</sup>	0.55±0.07 <sup>b</sup>	0.56±0.08 <sup>b</sup>
	Tac	0.52±0.07	0.54±0.06 <sup>b</sup>	0.54±0.07 <sup>b</sup>	0.55±0.08 <sup>a</sup>
Waist-to-hip-to-height ratio	CsA	0.91±0.09	0.97±0.09 <sup>b</sup>	0.98±0.10 <sup>b</sup>	0.60±0.07 <sup>b</sup>
	Tac	0.93±0.10	0.97±0.09 <sup>b</sup>	0.99±0.09 <sup>b</sup>	0.58±0.07 <sup>b</sup>
A body shape index	CsA	0.0808±0.0050	0.0839±0.005 <sup>b</sup>	0.0819±0.0056	0.0822±0.0050 <sup>c</sup>
	Tac	0.0813±0.0056	0.0827±0.005 <sup>a</sup>	0.0811±0.0047	0.0810±0.0052
Wrist circumference (cm)	CsA	16.7±1.3	16.7±1.3	16.8±1.8	16.6±1.6
	Tac	16.3±1.6	16.6±1.6 <sup>c</sup>	16.5±1.6	16.5±1.5
Neck circumference (cm)	CsA	35.7±2.7	37.5±2.8 <sup>b</sup>	36.9±3.5 <sup>a</sup>	36.6±3.5 <sup>c</sup>
	Tac	35.4±3.6	37.0±3.3 <sup>b</sup>	36.4±3.6 <sup>b</sup>	36.7±3.8 <sup>a</sup>

<sup>a</sup> p<0.01, <sup>b</sup> p<0.001, <sup>c</sup> p<0.05 vs. the preoperative values

## Conclusion

The type of calcineurin inhibitor used did not affect anthropometrical measurements throughout two years although both of them caused weight gain after transplantation. ABSI and NC are potential alternative indices for BMI or other anthropometric measures, but further studies with larger sample size are required in this regard.