

VALIDITY OF CONICITY INDEX, AS ABDOMINAL ADIPOSITY MEASURE, WITH ANTHROPOMETRIC MEASUREMENTS IN A RENAL TRANSPLANT RECIPIENTS COHORT

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INTRODUCTION AND AIMS

Cardiovascular disease (CVD) is the leading cause of death in renal transplant recipients and its incidence among these patients is threefold to fourfold over the one observed in the general population. Obesity, as an independent cardiovascular risk factor, is highly prevalent in this population. Accumulation of abdominal fat or central obesity has clearly demonstrated its association with metabolic abnormalities, higher degree of inflammation, worse graft survival and increased overall morbidity and mortality. Classical anthropometric measures such as body mass index (BMI) do not differentiate the distribution of body fat or attributable cardiovascular risk to abdominal adiposity; this is the opposite from other anthropometric parameters such as waist circumference (WC), waist to height ratio (WHR) and conicity index (Ci). There is controversy about the most suitable method to use in identifying patient risk method; on the other hand, there are few data in renal transplantation.

The aim of this study was to analyze the validity of the Ci in order to estimate levels of abdominal obesity through sensitivity; specificity and level of agreement over other anthropometric indicators in renal transplant patients were also evaluated.

METHODS

A cross-sectional study of 147 renal transplant recipient patients between November 2011 and August 2013 was conducted. 57.8% male, age 57.7 ± 14.2 years, 98.6% and cadaveric donors halftime functioning graft 10.6 ± 7.3 years. Reliability (Kappa index) and validity (sensitivity and specificity) of the Ci categorized according to the values provided in ROC analysis against BMI, WC and WHR were analyzed.

The WC was defined according to criteria of the IDF (International Diabetes federation) and ATP III (Adult treatment Panel III) to obtain values for the Ci differentiated by sex.

RESULTS

The highest level of agreement, measured by the Kappa index, was found between the Ci and WC (68% and 66%).

The cutoff points for best Ci were associated with WC, and there were 1.2429 (IDF) and 1.2891 (ATP III) in female; 1.3109 (IDF) and 1.3735 (ATP III) in male.

There was found a low rate of agreement with BMI and WHR. When the rate of agreement between the Ci, defined according to tertiles of the sample, with other anthropometric parameters was analyzed, the results were similar.

	BMI(Kg/m ²)	BMI1	BMI2	WC IDF (cm) ≥ 1.2429 Female ≥ 1.3109 Male	WC ATP III (cm) ≥ 1.2891 Female ≥ 1.3735 Male	WHR (cm/cm) 1.264
Kappa(CI 95%)	21.55 (9.951-33.59)	20.62 (6.53-34.71)*	30.96 (14.97-46.94)*	67.8 (53.77-81.94)**	65.9 (53.07-78.09)**	47.3 (27.94-66.64)***
Sensitivity % (CI 95%) †		32 (0.17-0.48)	25 (0.16-0.33)	90 (0.85-0.96)	83 (0.75-0.91)	87 (0.82-0.93)
Specificity % (CI 95%) †		4 (0.31-0.49)	44 (0.3-0.58)	81 (0.68-0.95)	83 (0.74-0.92)	85 (0.65-1.04)

CI: Conicity Index (ROC analysis). BMI: body mass index; BMI1: Normal Weight and Overweight vs. Obese. BMI2: Normal weight Vs Overweight and Obese. WHR: Waist to Height ratio

* Kappa index by quadratic weighted weights to compare the categories Normal weight, Overweight and Obese to Ci off the same BMI categories

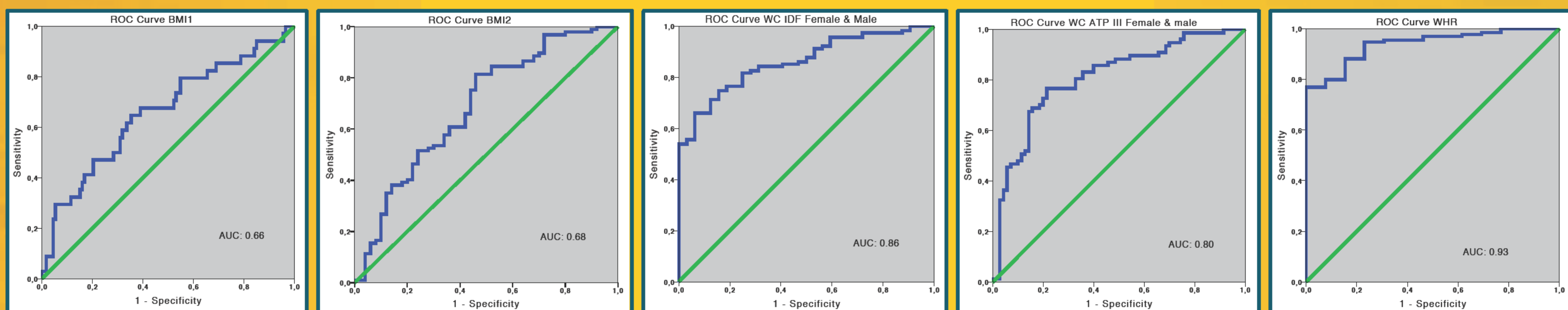
** Kappa index to compare the Ci categories of compared to the same categories of WC by gender according IDF and ATP III

*** Kappa index to compare the Ci categories to the same categories of WHR

† Sensitivity and specificity of Ci into two categories compared to the same categories of BMI, WC and WHR

	AUC	CI (95%)	p value
BMI1	0.66	0.55-0.77	0.005
BMI2	0.68	0.59-0.78	0.001
WC IDF	0.86	0.80-0.92	0.001
WC ATP III	0.8	0.73-0.88	0.001
WHR	0.93	0.89-0.98	0.001

AUC: Area under curve
CI (95%): Confidence Interval 95%
BMI: body mass index; BMI1: Normal Weight and Overweight vs. Obese. BMI2: Normal weight Vs Overweight and Obese. WHR: Waist to Height ratio



CONCLUSIONS

The Ci and BMI do not rank our patients with renal transplantation and obesity equally, as well as the WHR. However, we found a good agreement between the Ci and WC differentiated by sex. With these data we defined in our population a Ci cutoff that allows us to identify any at risk patient with abdominal obesity.

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