

## **INDANA CARDIOVASCULAR (CV) SCORE MAY SELECT HIGH-RISK RENAL TRANSPLANT PATIENTS FOR MACE WHO SHOULD UNDERGO AN AGGRESSIVE CV EVALUATION AT THE 5TH YEAR POST-TRANSPLANTATION**

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**INTRODUCTION:** Cardiovascular morbidity and mortality are a major cause of complication and death in renal transplantation. It is unclear whether cardiovascular scoring systems validated in the general population could be predictive of Major Acute Cardiovascular Events (MACE) also in the renal transplant recipients (KTx). The aim of this study was to evaluate the prognostic value of the Framingham and the INDANA score systems to predict MACE in KTx (Fig.1).

**METHODS.** We included 425 consecutive KTx who underwent kidney transplantation between 1997 and 2007 at a single renal transplant unit. During the follow-up period, all the acute major cardiovascular events were recorded, and stroke, myocardial infarction, angina pectoris, and cardiac death were considered MACE. The occurrence of MACE was related with well established cardiovascular risk factors as age, sex, arterial blood pressure, diabetes, renal function, CV history, BMI, dyslipidemia measured at 6 months, 5 and 10 years after transplantation. At these times the INDANA and Framingham scores were also calculated. In our protocol, all patients with a positive history of CV events or above 50 years were submitted to an echocardiostress with dobutamine before entering in the waiting list.

**RESULTS:** Majority of patients were male (62) had a MACE, in a crescent fashion according to time after transplant (0.5 of patients within 6mo-3y; 3.8 of patients between 5 years and 10 years post-tx. CV Risk factors at the time of transplantation associated with post-Tx MACE were age above 45y ( $p=0.007$ ), previous coronary disease ( $p=0.024$ ), previous total cholesterol above 204 mg/dL ( $p=0.035$ ), time on dialysis >2.8 years ( $p=0.020$ ), the presence of ventricular hypertrophy on EKG or echocardiography. ( $p=0.002$ ) and diabetes (0.014, all Cox univariate analysis). The INDANA score at all the time period analyzed was significantly different in patients with or without MACE ( $p<0.0001$ ) while no significant difference was observed by means of the Framingham score ( $p<0.11$ ). Considering this finding, we ranked 377 patients after 5 years of transplant according to INDANA risk score (from lower to higher) and submitted all patients from the first quartile (low risk,  $n=79$ ) vs the last quartile (high risk of MACE,  $n=76$ ) to a dobutamine echocardiostress. If positive, we proceeded to coronary angiography (and revascularization, if indicated). Stress was positive in only 17.6 (85% specificity of INDANA score).

**CONCLUSIONS:** Our study indicates that the INDANA scoring system can better predict the risk of MACE occurrence in KTx respect to the Framingham scoring system. We hypothesize that the inclusion of renal function in the INDANA score may explain the better predictive capability of MACE in renal transplant recipients. The INDANA score could be used to plan selectively CV screening test to patients in different moments of KTx life span.