

# Validation of four scores to predict contrast induced nephropathy in a Mexican population

Marcos T. Rodríguez-Avalos MD Joana Balderas MD Emmanuel Villalobos MD Armando Vázquez-Rangel, MD Department of Nephrology  
Instituto Nacional de Cardiología Ignacio Chávez México City, México.

**Purpose:** Population characteristics could affect the performance of predictive scores for contrast induced nephropathy (CIN) after coronary angiography. The aim of this study was to validate four clinical scores (Mehran et al, GRACE, Li et al, Abdel et al) to predict contrast induced nephropathy in our population.

**Methods:** Retrospective cohort including adult patients undergoing percutaneous coronary angiography at the Instituto Nacional de Cardiología Ignacio Chavez in Mexico City from January 2011 to December 2011. For discrimination, areas under curve (AUCs) and goodness of fit by Hosmer-Lemeshow (H-L) statistic were used. For calibration, logistic regressions introducing original variables were developed.

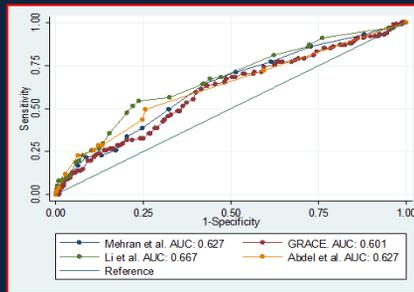
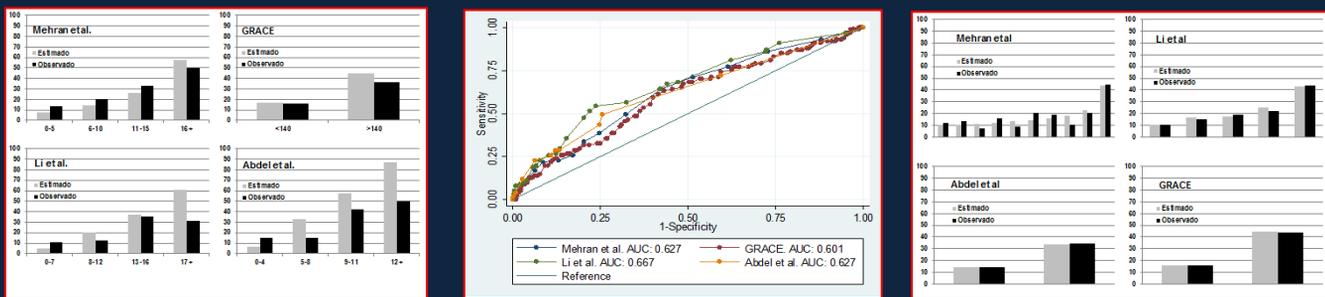
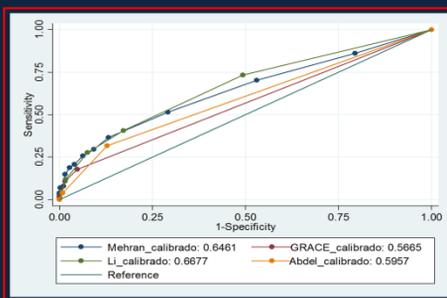


Figure A: observed incidences vs expected for scores of Mehran, GRACE, Li and Abdel et al. For contrast induced nephropathy. B: AUCs to predict CIN for Mehran, GRACE, Li and Abdel Scores C: observed incidences o vs expected for scores calibrated D: AUCs calibrated to predic CIN. E: Variables analyzed



	N=578	No CIN n (%)	with CIN n (%)	P<0.05
Male	451 (78)	378 (79.2)	73 (72.3)	0.124
DM-2	217 (37.5)	171 (35.8)	46 (45.5)	0.068
HTA	299 (51.7)	242 (50.7)	57 (56.4)	0.298
Shock cardiogénico	18 (3.1)	13 (2.7)	5 (5)	0.191
BIAP	15 (2.6)	7 (1.5)	8 (7.9)	0.001
ICC	85 (14.7)	75 (15.7)	10 (9.9)	0.133
Ischemic Heart disease History:	65 (11.2)	50 (10.5)	15 (14.9)	0.207
ACS ing	507 (87.7)	413 (86.6%)	94 (93.1%)	0.172
PCI urg	195 (33.7)	151 (31.7)	44 (43.6)	0.021
Troponin >=2	424 (73.4)	342 (71.7)	82 (81.2)	0.05
BIAP + Shock cardiogénico	26 (4.5)	16 (3.4%)	10 (9.9)	0.004
# Stents				0.143
0	262 (45.3)	223 (46.8)	39 (38.6)	
1	224 (38.8)	184 (38.6)	40 (39.6)	
2 o more	92 (15.9)	70 (14.7)	22 (21.8)	
Vol CM	160 (85.7-250)	155 (85-240)	185 (100-260)	0.02

**Results:** A total of 578 patients were analyzed, 101 patients (17.5%) developed CIN, the analysis of the incidence observed in our population vs those reported in the original studies were shown to be significantly different for Mehran (H-L 25.74, p=0.001), Li (H-L 56.74, p=0.001), and Abdel (H-L 65.56, p=0.001), except for GRACE (H-L 1.29, p=0.255). After calibrations AUCs did not improved. Remarkably, diabetes, age, heart failure, previous myocardial infarction, LVEF, gender or heart rate did not significantly contribute to risk assessment in our population. Only renal function, hemodynamic status, anemia, emergency procedure and amount of contrast media are significant predictors of CIN in our population.

**Conclusions:** Clinical scores underestimate the risk of CIN, these scores did not adequately predict the probability of develop CIN in our population.