The significant role of coronary artery calcification score in asymptomatic patients with metabolic syndrome

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Background: Metabolic syndrome (MetS) is a clinical condition composed of metabolic and cardiovascular risk factors, such as abdominal obesity, hyperglycemia, dyslipidemia and hypertension. Many patients with MetS suffer major adverse cardiovascular events (MACE) that are not adequately identified by traditional risk assessment, suggesting the need for early detection of subclinical coronary heart disease to identify those at high-risk. Coronary artery calcification (CAC) screening has added utility in categorizing patients with low, intermediate and high cardiovascular risk.

Purpose: Evaluate the prognostic role of CAC score in asymptomatic population patients with metabolic syndrome in cardiovascular events risk prediction.

Methods: A total of 1,122 asymptomatic individuals without known coronary heart disease, enrolled from GENEMACOR study, were followed for a mean of 5.3±3.4 years for the primary endpoint of all-cause of cardiovascular events. All were referred for computed tomography for the CAC scoring assessment. According to the Hoff's nomogram, 3 categories were created: low CAC (0≤CAC<100 or P<50); moderate CAC (100≤CAC<400 or P50–75) and high or severe CAC (CAC≥400 or P>75). In a subgroup of 507 individuals with MetS and 615 controls, CAC values were compared by T-student and association of CAC severity with events occurrence was evaluated. Finally, a logistic regression model adjusted for CAC severity was performed in patients with MetS.

Results: Among our population, the extent of CAC differs significantly between men and women in the same age group. Patients with Mets (23.2%, n=115) had higher CAC scores than controls (219.0±486.0 vs 115.8±370.8, p<0.0001). In this cohort, with higher CAC scores, 46.7% vs 22.5% had MACEs (p=0.049) during the follow-up. The logistic regression analysis revealed that CAC≥400 is a MACE predictor (OR=4.326, CI 95% 1.241–15.080, p=0.021) in patients with MetS.

Conclusion: Our results point to the importance of the inclusion of CAC screening in patients with MetS to further stratify those patients that, despite tight control of cardiovascular risk factors, may benefit from more intensive therapies. This tool is a useful and straightforward method that could have a significant impact on the prognosis of future cardiovascular disease in patients with MetS.

Association between CAC score and MACE in in the Metabolic Syndrome

Variable	Odds ratio (95% CI)	p value
0≤CAC<100	Reference	*0.071*
100≤CAC<400	2.519 (0.619-10.256)	*0.197*
CAC≥400	4.326 (1.241-15.080)	*0.021*

Logistic regression, Forward wald method (SPSS vs. 25.0). CI – Confidence interval; Statistically significant for p<0.05.