The Correlation Between Left Ventricular Global Longitudinal Systolic Strain and Coronary Artery Disease Severity

Ahmed Moustafa, Sherif Ayad, Ali Zidan, Sanaa Ashour

OBJECTIVE

We aimed to evaluate the correlation between left ventricular global longitudinal systolic strain (GLSS) and coronary artery disease severity assessed by SYNTAX score (SS) in patients with suspected CAD.

METHODS AND RESULTS

we examined sixty four consecutive patients undergoing both coronary angiography and transthoracic echocardiography within 15 days. All patients had normal left ventricular ejection fraction and segmental wall motion on resting echocardiogram. GLSS was calculated using 2-D speckle tracking echocardiography. Images were obtained in the apical long-axis, four-chamber, and two-chamber views with a frame rate of a minimum 45 frames per second. GLSS was calculated from the average of the peak systolic longitudinal strain of all 17 segments. SS was calculated for all patients based on presence and/or severity of coronary artery disease (CAD). There was 21 patients with SS ≥ 22 (GLSS mean ± SD = -15.05 ± 2.71), 23 patients with SS<22 (GLSS mean ± SD = -16.09 ± 2.56) and 20 persons (control group) with no CAD on angiogram (GLSS mean ± SD = -19.75 ± 2.10). There was no statistically significant deference regarding Age, sex and most of the risk factors as hypertension, diabetes mellitus, smocking, obesity or family history of CAD between the 3 groups. The mean GLSS was significantly lower in the CAD groups than the control group (P<0.001).

There was statistically significant inverse correlation between GLSS and SS values ($\mathbf{r_s}$ = - 0.621, P <0.001) .Receiver operating characteristic curve analysis identified that the optimal cut-off for the detection of patients with SS ≥ 22 was -15% [AUC 0.736, 95% CI 0.603 – 0.870, p=0.002]. The sensitivity, specificity, positive predictive value, negative predictive value and accuracy of GLLS were 71.43%, 83.72%, 68.18%, 85.71% and 79.69% respectively.

CONCLUSION

The results of our study suggest that there is a significant inverse correlation between GLSS and SS. GLSS might be promising in detecting patient with SS ≥ 22 on coronary angiogram.