Does global longitudinal strain predict long-term outcome in patients presenting to the emergency department with chest pain?

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Background: Two-Dimensional Strain for Diagnosing Chest Pain in the Emergency Room (2DSPER) was a prospective multicenter study designed to determine whether 2D longitudinal strain (2DLS) can assist in triage of patients with chest pain in the emergency department (ED). In that study 2DLS was not useful to rule out acute coronary syndromes (ACS) in the ED, partly because many patients without ACS had abnormal 2DLS. The prognostic significance of 2DLS in these patients is unclear.

The aim of the current study was to determine whether global longitudinal strain (GLS), measured using 2D echocardiography in the ED, can predict long-term outcome.

Methods: Long-term (median 7.7 years [IQR 6.7-8.2]) major adverse cardiac events (MACE; cardiac death, ACS, revascularization, hospitalization for heart failure or atrial fibrillation) was available in 525 of 605 patients (87%) enrolled in the 2DSPER study. The study prospectively enrolled patients presenting to the ED with chest pain and suspected ACS but without a diagnostic ECG or elevated troponin. Global longitudinal strain (GLS) was computed from echocardiograms performed within 24 hours of chest pain using a dedicated 2DLS software (EchoPAC SW; GE Vingmed Ultrasound AS). MACE of patients with worse GLS (>median) was compared to those with better GLS (≤median).

Results: Median GLS was -18.8%. MACE occurred in 43/249 (17.3%) of patients with worse GLS (-16.8 ± 1.5) as compared with 49/276 (17.8%) with better GLS (-20.8 ± 1.6), HR 0.98 (95%CI 0.65-1.4, p = 0.9) (Figure). Similarly, there was no significant difference in total mortality (6% vs. 4.7%, p = 0.5), cardiac death (0.4% vs. 0.7%, p = 0.6), ACS (8% vs. 8.3%, p = 1), revascularization (10% vs. 10.9%, p = 0.8), hospitalization for heart failure (0.8% vs. 2.2%, p = 0.2) or atrial fibrillation (3.6% vs. 4.3%, p = 0.7) between groups. Predictors of MACE were male gender (HR 2.5, 1.4-4.3, p = 0.02), history of coronary artery disease (HR 3.3, 2-5.4, p < 0.0001) and hypertension (HR 1.8, 1.2-2.8, p = 0.005), but not GLS (HR 0.98, 0.7-1.5, p = 0.9).

Conclusions: GLS did not predict long term outcome in patients presenting to the ED with chest pain. Long-term outcome was favorable in the group of patients with worse GLS, similar to better GLS.

Abstract Figure.