Fetuin-A: Relation to Myocardial Function and Left Ventricular Remodeling after Acute STEMI

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Background

Fetuin-A, a glycoprotein synthesized by the liver, increases the solubility of calcium and phosphorus and plays a key role in anti-inflammatory processes. The relationship between circulating fetuin-A and cardiac remodeling has not been studied so far in STEMI patients. We therefore investigated the association between plasma fetuin-A concentrations and left ventricular function, infarct size and the occurrence of adverse remodeling at 4 months after mechanical reperfusion for STEMI.

Methods

All patients (n = 52, mean age: 58 ± 10 years, 15 % female) underwent contrast-enhanced cardiac magnetic resonance imaging within the first week after STEMI and 4 months thereafter. Left ventricular dimensions and function were measured from cine true-FISP sequences. Infarct size was determined with the use of late gadolinium enhanced images.

Fetuin-A values were determined from blood samples drawn at a median of 2 days (IQR 1 - 3 days) after STEMI by a sandwich immunofluorescent assay. Adverse remodelling was defined as an increase in end-diastolic volume of ≥ 20% after 4 months.

Conclusion

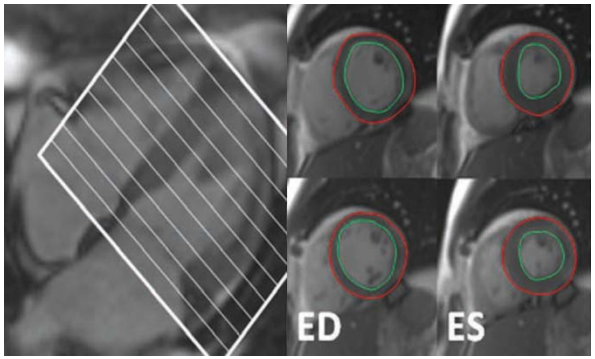

Figure 1: *Evaluation of cine short-axis views with use of semiautomatic segmentation. Endocardial (green) and epicardial (red) borders are delineated in end-diastole (ED) and end-systole (ES).*

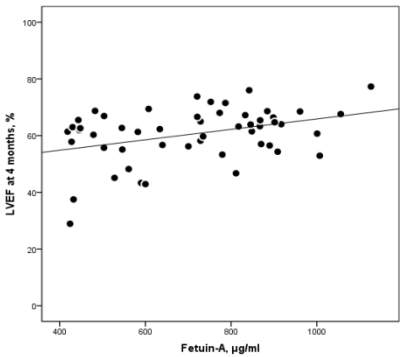

Figure 2: *Linear correlation of fetuin-A and left ventricular ejection fraction (LVEF) at 4 months (r = 0.373, p = 0.006).*

Results

Fetuin-A levels (mean: 709 ± 193 µg/ml) were significantly related with 4-month ejection fraction (r = 0.373, p = 0.006) and the increase in end-diastolic volume index between baseline and follow-up (r = -0.419, p = 0.002). Patients with adverse remodeling (n = 7) showed significantly lower baseline fetuin-A levels (528 ± 88 µg/ml vs. 737 ± 190 µg/ml, p < 0.001) compared to patients without remodeling (n = 45).

The area under the curve of fetuin-A (0.79, 95% CI 0.67 to 0.92) with the optimal cut-off value of 670 µg/ml revealed 100% sensitivity and 67% specificity (NPV = 100%, PPV = 32%) in the prediction of adverse remodeling at 4-month follow-up.

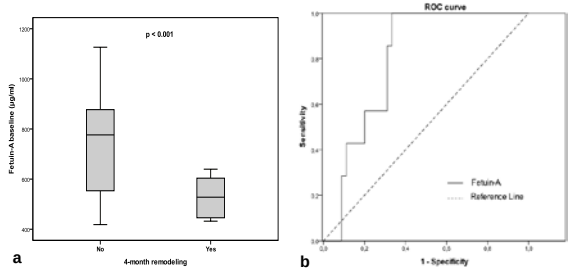

Figure 3: *(a) Patients with adverse remodeling (n = 7) at 4 months revealed lower baseline fetuin-A levels (528 vs. 737 µg/ml) than patients without remodeling (n = 45). (b) ROC curve (AUC: 0.79, 95% CI 0.67 to 0.92) of fetuin-A for prediction of adverse remodeling.*

Circulating fetuin-A at day 2 after STEMI is a predictor of 4-month myocardial function and adverse remodeling.