Determinants of B-type natriuretic peptide release in acute non ST segment elevation myocardial infarction
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Background: B-type natriuretic peptide (BNP) has been shown to predict clinical outcome in patients with acute coronary syndromes even in the absence of signs of cardiac failure. The exact triggers for BNP release in these patients remain to be elucidated.

Methods: a total of 83 patients, median age of 63 years, with an acute non ST segment elevation myocardial infarction who underwent invasive evaluation within 72 hours after admission were included. Patients with signs of cardiac failure or with a left ventricular ejection fraction (LVEF) < 30% were excluded. Samples for BNP were taken at the time of the invasive evaluation and were correlated with parameters of systolic left ventricular function (LVEF) and diastolic function (left ventricular end diastolic pressure (LVEDP)), with the characteristics of the infarct related artery (% vessel stenosis, TIMI flow), with the extent of myocardial ischemia (troponin, amount of jeopardised myocardium, number of diseased vessels) and with the clinical parameters of the patients such as gender and TIMI risk score. The amount of jeopardised myocardium was assessed by the BARI angiographic risk score.

Results: median BNP was 93 (43-226, 25th and 75th percentile) pg/ml. Stepwise regression analysis identified TIMI risk score, gender and LVEDP as the only independent variables of BNP (see also figure). BNP in patients with a LVEDP ≤ 15 mm Hg was 52 (29-102) pg/ml whereas it was 128 (51-315) pg/ml in LVEDP > 15 mm Hg (p 0.0013). No correlation existed between LVEDP and the extent of ischemia as assessed by the amount of jeopardised myocardium or troponin level.

Patient characteristics  Median (interquartile range)

Clinical parameters
- Age (years) 63 (54-74)
- Male % 69
- TIMI risk score 4 (3-5)
- Diabetes (%) 20
- Hypertension (%) 55

Infarct related artery
- Vessel stenosis (%) 70 (64-77)
- TIMI flow 2 (2-3)
- LAD involvement (%) 39

Ischemia
- Vesselscore 6 (4-10)
- Number of diseased vessels 2 (1-3)
- Troponine I (ng/ml) 0.7 (0.2-2.6)

Left ventricular function
- Left ventricular ejection fraction (%) 64 (57-73)
- Left ventricular end diastolic pressure (mm Hg) 21 (15-30)

B-type natriuretic peptide (pg/ml) 93 (44-226)

Conclusions: In this study of patients with a non ST segment elevation myocardial infarction and preserved left ventricular function, BNP release was mainly determined by diastolic dysfunction (defined as a LVEDP > 15 mm Hg) and by the global risk profile of the patient. BNP release was not influenced by the extent of myocardial ischemia.

Figure: Relation between BNP, TIMI risk score and elevated LVEDP for men. TIMI risk score: low (0-3), intermediate (4-5) and high risk (6-7)