

ATRIAL AND BRAIN NATRIURETIC PEPTIDE IN CARDIAC SURGICAL PROCEDURES

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Background: Atrial and brain natriuretic peptide are cardiac hormones with natriuretic, vasorelaxing and antiproliferative properties. Based upon transgenic mice models it was proposed that both peptides play a complementary role in the regulation of cardiovascular homeostasis¹. However, the exact role of these peptides in humans is still unclear and no data are available for patients undergoing cardiac surgical procedures.

Methods: We measured atrial and brain natriuretic peptide in 40 healthy volunteers and in 105 patients who underwent coronary artery bypass grafting with (n=28) or without (n=32) ventricular dysfunction, or mitral (n=21) or aortic (n=24) valve replacement.

Results: Atrial but not brain natriuretic peptide was closely associated with volume reloading of the heart after aortic cross clamp in all patients (3-5 fold increases of baseline values 20 min after cardiopulmonary bypass, $p < 0.05$). The secretion pattern of brain natriuretic peptide during surgery was much less uniform. Brain natriuretic peptide but not atrial natriuretic peptide concentrations correlated with the aortic cross clamp time ($r^2 = 0.46$, $P = 0.002$, $n = 60$) in bypass patients, and preoperative increases were associated with a higher postoperative (2 year) mortality in these patients. Markedly elevated baseline (preoperative) brain natriuretic peptide concentrations in mitral (3-fold) and aortic valve disease patients (14-fold) did not further increase during cardiopulmonary surgery.

Conclusions: Atrial and brain natriuretic peptide show a differential secretion pattern in cardiac surgery patients. The data suggest that atrial natriuretic peptide is primarily involved in volume balance, whereas the secretion of brain natriuretic peptide is related to other factors such as ischemia and long term left ventricular pressure and/or volume overload.

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