



Invited critical review

B-type natriuretic peptide in acute pulmonary embolism

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ABSTRACT

Myocardial stretch leads to the natriuretic peptides release in acute or chronic left ventricular dysfunction. However, there is an accumulating evidence that B-type natriuretic peptide (BNP) and its N-terminal fragment (NT-proBNP) may originate from right ventricle and their concentrations are elevated in patients with acute pulmonary embolism (APE) especially when resulting in right ventricular dysfunction (RVD). Recently it is underlined that severity assessment of APE as well as the risk stratification and therapy selection is based both on patients' hemodynamic status and markers of myocardial injury and RVD. BNP and NT-proBNP are helpful in identifying patients with RVD in APE, emerging as an adjunctive tool to echocardiography. Elevated BNP or NT-proBNP levels are also significant predictors of death and/or complicated clinical course in APE.

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It is well known that myocardial stretch leads to the natriuretic peptides release in acute or chronic left ventricular dysfunction. However, there is an accumulating evidence that concentrations of B-type natriuretic peptide (BNP) and its N-terminal fragment (NT-proBNP) are elevated in patients with acute pulmonary embolism (APE) especially when resulting in right ventricular dysfunction. Recently it is underlined that severity assessment of acute pulmonary embolism (APE) as well as the risk stratification and therapy selection is based both on patients' hemodynamic status and markers of myocardial injury and right ventricular dysfunction (RVD). Right ventricular function can be directly assessed at echocardiography and/or contrast enhanced spiral computed tomography. Since plasma concentration of brain natriuretic peptide reflects the severity of RVD its assessment was implored in APE risk stratification as well.

We performed a systematic review aimed on B-type natriuretic peptides in APE especially for the RVD detection and clinical course prediction.

1. Studies selection

Overall 49 articles were found searching PubMed by terms 'pulmonary embolism', 'BNP' and 'NT-proBNP' from 1997 to March 2008. Thirty two papers were excluded from current review because they were case reports, review papers, editorials or letters. They did not report on end-points or did not provide values of biomarkers concentration.

Eventually, 17 studies concerning the influence of elevated BNP and NT-proBNP on short-term mortality, adverse outcome events (death, cardiogenic shock, need for thrombolysis, catheter or surgical embolectomy, use of vasopressors, need for endotracheal intubation and mechanical ventilation, cardiopulmonary resuscitation) and RVD were selected (Table 1).

2. BNP and NT-proBNP assays

Propeptide for B-type natriuretic peptide (proBNP) is cleaved to equimolar amounts of B-type natriuretic peptide (BNP) and N-terminal fragment (NT-proBNP). BNP is physiologically active.

BNP concentration is assessed using several radioimmunologic assays or immunofluorometric assays, while for NT-proBNP one test is

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