



ORIGINAL ARTICLE

Post-procedural N-terminal pro-brain natriuretic peptide predicts one-year mortality after transcatheter aortic valve implantation

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KEYWORDS

Transcatheter aortic valve replacement;
Aortic valve stenosis;
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Abstract

Introduction: Natriuretic peptides are ubiquitously used for diagnosis, follow-up and prognostic assessment in various heart conditions. N-terminal pro-brain natriuretic peptide (NT-proBNP) correlates with aortic stenosis severity, however its significance after transcatheter aortic valve implantation (TAVI) is not well established.

Aim: We aimed to assess the prognostic value of NT-proBNP at one year in patients undergoing TAVI.

Methods: This single-center retrospective analysis included 151 patients in whom both baseline and one-month post-procedure NT-proBNP were measured, from 206 consecutive patients undergoing TAVI between November 2008 and December 2014. The best cut-off values of both baseline and one-month post-TAVI NT-proBNP for one-year mortality were determined by receiver operating characteristic curve analysis. Independent predictors of one-year mortality were assessed by Cox regression.

Results: The areas under the curve of baseline and post-procedural NT-proBNP for one-year mortality were 0.60 and 0.72, with the best cut-off values of 1350 and 2500 pg/ml, respectively. Atrial fibrillation, procedure-related major bleeding, baseline NT-proBNP higher than 1350 pg/ml, post-procedural NT-proBNP higher than 2500 pg/ml, higher creatinine and Society of Thoracic Surgeons score, and lower left ventricular ejection fraction were associated with one-year mortality. Only post-procedural NT-proBNP was independently and negatively associated with one-year survival (HR 5.9, 95% CI 1.6-21.7, $p=0.008$).

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PALAVRAS-CHAVE

Válvula aórtica
percutânea;
Estenose aórtica;
N-terminal pro-BNP;
Prognóstico

Conclusions: Baseline NT-proBNP did not predict one-year mortality; on the other hand one-month post-procedural NT-proBNP higher than 2500 pg/ml may identify a high-risk subset of patients, allowing better management, care and hypothetically outcome.

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O peptídeo natriurético cerebral N-terminal prediz a mortalidade a um ano após implantação de válvula aórtica percutânea

Resumo

Introdução: Os peptídeos natriuréticos são usados de forma ubíqua para o diagnóstico, seguimento e avaliação prognóstica em cardiologia. O NT-ProBNP correlaciona-se com a gravidade da estenose aórtica, porém o seu significado após VAP não está bem estabelecido.

Objetivo: Avaliar o valor prognóstico do NT-ProBNP nos doentes submetidos a VAP.

Métodos: Análise retrospectiva de 151 doentes, de um registo de 206 doentes consecutivos de novembro de 2008 a dezembro de 2014, com doseamentos de NT-ProBNP basal e após um mês da implantação de VAP. Os preditores independentes de mortalidade a um ano foram avaliados por regressão Cox.

Resultados: Os melhores valores discriminativos de NT-ProBNP basal e pós-procedimento foram 1.350 e 2.500, respetivamente. Somente um valor de NT-ProBNP pós-procedimento superior a 2.500pg/ml foi preditor independente e negativamente associado à sobrevida a um ano (HR 5,9; 95% IC 1,6-21,7; p = 0,008).

Conclusões: O NT-ProBNP basal não previu a mortalidade a um ano. Por outro lado, o NT-ProBNP superior a 2.500pg/ml após o procedimento identificou um subgrupo de doentes de alto risco, permitiu um melhor manejo, seguimento e possíveis resultados.

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Introduction

Transcatheter aortic valve implantation (TAVI) has emerged as a safe and effective alternative to surgical aortic valve replacement (SAVR) in high-risk or inoperable patients with severe aortic stenosis.¹ Refinement in patient selection has prompted the use of multiple risk scores and analytical parameters to help predict outcomes. Most have been ineffective in that regard, with limited performance in this population with numerous comorbidities.²

Patients with severe aortic valve stenosis have elevated N-terminal pro-brain natriuretic peptide (NT-proBNP) levels, due to increased myocardial wall stress and pressure overload.³ Increased concentrations of this peptide have prognostic value in multiple heart conditions, and can be used for risk stratification.^{4,5} There is a correlation between NT-proBNP levels and severity of aortic stenosis.⁴ The post-procedural impact of NT-proBNP has been studied,⁶⁻⁹ and found to predict one-year mortality.¹⁰ However there is no established threshold beyond which outcomes worsen.

We sought to analyze the one-year prognostic value of NT-proBNP levels before and at one month after TAVI.

Methods

Patient population and data collection

The Valve Catheter Restorative Operation on Santa cruz hoSpital (VCROSS) registry is an all-comer prospective

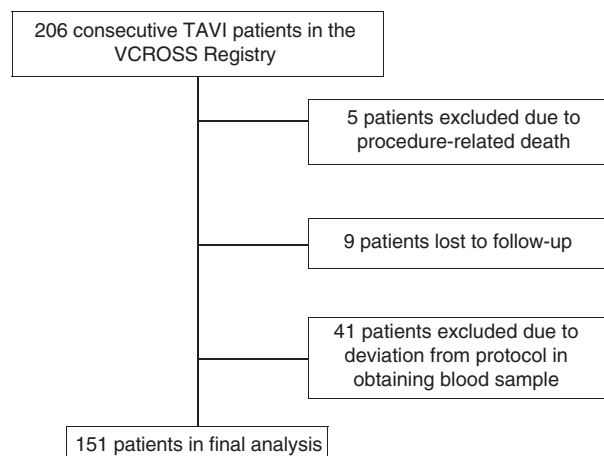


Figure 1 Study population. TAVI: transcatheter aortic valve implantation.

single-center observational study that includes all consecutive patients with symptomatic aortic stenosis undergoing TAVI. Between November 2008 and December 2014 a total of 206 patients were treated, of whom 55 were excluded from this analysis (Figure 1): 46 patients deviated from the protocol for baseline or post-procedural NT-proBNP collection (five patients died before the 30-day assessment) and nine had follow-up in different institutions. A total of 151 patients thus entered the final analysis.

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