



Abstract 12 Figure 1 Evolution of mortality rates in Brazil for myocardial infarction and heart failure from 1998 to 2015

13 NOVEL BIOMARKERS IN ASSESSING OUTCOME IN PATIENTS WITH SEVERE AORTIC STENOSIS AND HEART FAILURE

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10.1136/heartjnl-2016-309890.13

Introduction Severe Aortic stenosis (AS) and non-valvular heart failure (HF) appear to have different pathological processes, and therefore cardiac remodelling is likely to involve different pathways. Novel biomarkers have been developed to assess prognosis, response to treatment and also to understand the underlying mechanism of cardiac remodelling. We identified from the literature the biomarkers that have shown to demonstrate promise in assessing aortic stenosis and heart failure. We compared the differences in levels between the two groups and to see how they predict outcome (all-cause mortality). We identified biomarkers of fibrosis (ST2, galectin 3), matrix remodelling (osteopontin, PIIINP, TIMP1), stretch (NT-pro BNP, cardiotrophin/CTP).

Methods We studied a total of 140 patients. 48 patients were recruited with chronic heart failure and EF \leq 40% from the HF clinics at Kings College Hospital, London on optimal doses of HF medication and device therapy according to ESC Guidelines. In addition, we also examined 92 patients who were awaiting TAVI for severe aortic stenosis. Prior consent was obtained, and serum was sent for analysis of NT-pro BNP, serum ST2, Galectin 3, osteopontin, TIMP1, CTP and PIIINP. These patients were followed up as part of routine care for the time of the study. No patients were lost to follow up. Statistical analysis was performed on SPSS, and median biomarker values were analysed non-parametrically. We chose 2 year follow up because of many landmark studies investigating the prognosis of severe aortic stenosis and the impact of TAVI are around 2 years.

Results Out of a total of 140 patients, 24 patients were registered dead at one year and 81 at the end of 3 year follow up. Baseline ejection fraction remains the best predictor of prognosis of all causes mortality at one year in keeping with previous studies. However, the area under the curve for ST2 at baseline appeared to be the most promising of all the biomarkers (0.612) compared with NT-pro BNP (0.610), TIMP1 (0.610), CTP (0.602) Osteopontin (0.601), PIIINP (0.353), Galectin 3 (0.370). When we repeated the ROC analysis with 2 year mortality, NT-pro BNP still had the highest AUC (0.685), followed by TIMP 1 (0.639), Osteopontin (0.633), CTP (0.628), ST2 (0.555), ejection fraction (0.528), Galectin 3 (0.458) and PIIINP (0.322). Combining biomarkers in a multi-marker panel improved the AUC even further.

Conclusions Novel biomarkers appear to give important prognostic information as good as ejection fraction and traditional biomarkers like NT-pro BNP in patients with severe aortic stenosis and optimally managed heart failure. The cost of NT-pro BNP remains high despite the assay in commercial and clinical use, therefore limiting its wider use in the UK. Novel biomarkers which may provide similar prognostic information individually or as a multi-marker panel may be an alternative worthy of a larger trial in future.

14 DELAYS IN REFERRAL FOR SPECIALIST ASSESSMENT FOLLOWING A POSITIVE NATRIURETIC PEPTIDE RESULT IN PATIENTS WITH SUSPECTED HEART FAILURE

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10.1136/heartjnl-2016-309890.14

Introduction Heart failure (HF) is associated with significant morbidity and the prognosis is frequently poor. Symptoms, quality of life and outcome can be hugely improved by the implementation of appropriate evidence based therapies by a specialist multidisciplinary team. Current NICE guidelines

Abstract 14 Table 1 Comparison of the interval from a positive NTproBNP result to referral and the interval from referral to appointment. Patients who declined an initial HF clinic appointment have been excluded

	NTproBNP to referral (days)			Referral to clinic review (days)	
	Number of Patients (n)	Mean ± Standard Deviation	Range	Mean ± Standard Deviation	Range
2 week pathway	211	16 ± 16	-0 - 124	11 ± 7	1-20
6 week pathway	209	19 ± 19	-4- 188	34 ± 1	4-42

therefore recommend that patients with suspected HF and raised natriuretic peptides are seen for echocardiography and specialist assessment within 2 or 6 weeks of referral. We established a dedicated HF clinic locally; natriuretic peptides are checked in primary care and patients with a positive result are referred via fax. Given the time-critical nature of these guidelines we investigated local adherence to the 2 and 6-week targets and the interval from a positive natriuretic result in primary care to referral.

Methods Information on the referral pathway was disseminated to all primary care referrers. Patient data were prospectively collected after establishment of the HF clinic in February 2014 to the end of November 2015. The interval from a positive NTproBNP result to referral and the interval from referral to appointment were calculated. Basic demographic data, NTproBNP level and the final specialist opinion as to whether the patient had heart failure were also collated. Patients with incomplete data sets were excluded.

Results A total of 432 patients were included. 226 (52%) were female and 206 (48%) male. Mean age was 78 ± 9 and mean NTproBNP 3101 ± 4445 pg/ml. 239 (55%) patients had a diagnosis of HF following review, of these 123 (51.5%) had a reduced ejection fraction and 116 (48.5%) a preserved ejection fraction.

All 212 (100%) patients were offered an appointment within the 6 week target and 211 (97%) within the 2 week target. 9 patients (4%) in the 2 week pathway and 3 (1%) in the 6 week pathway declined the appointment that was offered and where therefore seen beyond the target timeframe.

There were significant delays between the positive NTproBNP result and referral to the HF clinic (Table 1). Most notably for the 2 week pathway the mean interval from a positive NTproBNP to referral was longer than the interval from referral to appointment (16 days versus 11 days respectively). One patient was referred 124 days after the positive NTproBNP result.

Conclusion The purpose of including referral-time targets in the NICE guidelines is so that patients with suspected HF are seen rapidly as they are at high risk of adverse outcome. Despite offering a service compliant with these targets we've identified significant delays between a positive NTproBNP result in primary care and referral to clinic. This unnecessary delay may have an adverse effect on outcome. Further refinement of the primary care aspect of the referral pathway is required.

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NT PRO-BNP TEST CAN SAVE NHS £ 1.6 MILLION PER YEAR

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10.1136/heartjnl-2016-309890.15

Purpose To find out the number of inappropriate echocardiogram requests made despite a negative NT pro-BNP test (<400 pg/l) and in even more negative test (<300 pg/l).

To estimate the cost burden on NHS.

To look at the impact on waiting times in the department from these requests.

Method We conducted a retrospective audit reviewing the NT pro-BNP requests in

Abertawe BroMorgannwg University Health Board. Data was collected from all NT pro-BNP assays from January 2013 to January 2014. The criteria of NT pro-BNP level of less than 400 ng/l was set according to the NICE Guidelines for Chronic heart failure 2010. We also looked if any requests were made when BNP levels were less than 300 ng/l.

Findings 370 NT pro-BNP requests were done during this period and 334 (90.27%) requests were from primary care. 300 assays were less than 400 ng/l and essentially ruled out heart failure. Regardless of the results, 190 requests were made for an echocardiogram to assess Left Ventricular function. 137 out of 190 (72%) of these echo requests were made in patients with a BNP level of less than 400 ng/l. The mean BNP level in patients with values of less than 400 ng/l was 120 ng/l. 278/370 assays had a BNP value of <300pg/l making heart failure very unlikely, but 120 echo requests were made in this group.

Conclusion Despite high negative predictive value of NT pro-BNP levels, significant amount of echo requests are made. The burden on our echo department is an extra 137 requests which amounts to 34.5 sessions by a sonographer/year. This amounts to 6,400 wasted echo sessions in NHS/year. The financial burden to NHS is estimated at around 137 inappropriate echo requests in 160 NHS Foundation Trust/Health Board at a cost of £75/ scan = £ 1.6 million/year.

Recommendation Health professionals requesting the above tests should be made aware of the above findings and educated especially in the primary care setting.

The echo department should have strict criteria to perform echocardiograms in patients with normal NT pro-BNP levels.

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REVIEW IN A NICE COMPLIANT SPECIALIST CLINIC IS ASSOCIATED WITH REDUCED HOSPITALISATION IN PATIENTS WITH SUSPECTED HEART FAILURE

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10.1136/heartjnl-2016-309890.16

Introduction NICE guidelines recommend that patients with suspected heart failure (HF) and raised natriuretic peptides are referred for timely echocardiography and specialist assessment. Limited data are available on whether this affects outcome. We provide Trust-based NTproBNP assays for primary care, a simple referral pathway and a dedicated one-stop HF clinic fully compliant with NICE waiting time targets. Despite this, it was apparent that many patients with suspected HF and raised NTproBNP levels were not being referred and were being managed in non-specialist primary care settings. The aim