

N-TERMINAL- PRO BRAIN NATRIURETIC PEPTIDE (NT-PRO-BNP) PREDICTS CARDIOVASCULAR STATUS AND OUTCOMES IN DIABETIC HAEMODIALYSIS PATIENTS

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INTRODUCTION

Brain (B-type) natriuretic peptide (BNP) is a peptide hormone that is released primarily by the ventricular myocytes in response to myocyte stretch such as increased cardiac filling pressure. It is synthesized as an inactive prohormone and is cleaved into the biologically active fragment (c-BNP) and the N-terminal pro-B-type natriuretic peptide (NT-pro-BNP). Numerous studies have demonstrated the potential value of BNP measurement in predicting abnormal ventricular function in the general population. In addition, elevated BNP and NT-pro-BNP may result directly from cardiac ischemia, are useful in diagnosing heart failure which is frequent in diabetic haemodialysis (HD) patients

AIM

This study was performed to determine whether the N-terminal pro-brain natriuretic peptide (NT-pro-BNP) is a useful biomarker in predicting cardiovascular congestion, mortality, and cardiovascular death and event in diabetic haemodialysis (HD) patients

METHOD

A prospective multicenter cohort study was conducted in 83 diabetic HD patients. Serum NT-pro-BNP was measured at baseline together with echocardiography and dialysis indices. Each patient was followed for 5 yr from the day of enrollment or until death. Time to develop first episode of cardiovascular congestion and other cardiovascular event and time to mortality and cardiovascular death were studied in relation to NT-pro-BNP. NT-pro-BNP showed the strongest correlation with membrane type on HD, followed by left ventricular ejection fraction (LVEF) and left ventricular mass index (LVMI).

RESULTS

In the univariate Cox regression model, NT-pro-BNP was a significant predictor of cardiovascular congestion, mortality, and cardiovascular death and event.

In the fully adjusted multivariate analysis, NT-pro-BNP showed the strongest correlation with membrane type on HD ($r = -0.314$, $P < 0.001$), followed by LVEF ($r = -0.221$, $P < 0.001$), LVMI ($r = 0.213$, $P < 0.001$), systolic BP ($r = 0.169$, $P < 0.001$), duration of HD ($r = -0.168$, $P = 0.001$), hemoglobin ($r = -0.146$, $P = 0.003$), CRP ($r = -0.080$, $P = 0.010$), valvular calcification ($r = 0.109$, $P = 0.020$), previous history of cardiovascular congestion ($r = 0.108$, $P = 0.034$), serum albumin ($r = -0.093$, $P = 0.045$), and atherosclerotic vascular disease ($r = 0.095$, $P = 0.047$).

DISCUSSION

Elevated BNP and NT-pro-BNP may result directly from cardiac ischemia. There is ample evidence that BNP and NT-pro-BNP are useful in diagnosing heart failure and predict prognosis in heart failure BNP guidance in treating heart failure also has been shown to reduce subsequent cardiovascular events in hospitalized heart failure patients. These findings are of particular relevance to diabetic patients who have ESRD and receive long-term haemodialysis (HD) treatment, because they are frequently complicated with volume overload and hypertension, which contribute to a high incidence of ventricular hypertrophy and dysfunction, heart failure, and cardiovascular mortality. Indeed, natriuretic peptides are elevated almost universally in patients with ESRD as a result of the high prevalence of left ventricular hypertrophy (LVH) and ventricular dysfunction and markedly diminished renal clearance. Cardiac natriuretic peptides, especially BNP, are useful in identifying dialysis patients with LVH, excluding systolic dysfunction (26), and predict mortality independent of LV mass (LVM) and LV ejection fraction (LVEF).

CONCLUSIONS

These data showed that NT-pro-BNP could be an important risk predictor of cardiovascular congestion, mortality, and adverse cardiovascular outcomes in chronic HD patients and adds important prognostic information beyond that contributed by left ventricular hypertrophy, systolic dysfunction, and other conventional risk factors. Further studies are required to confirm the hypothesis above.

