Original Research Paper

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Cardiology

ROLE OF NT PRO BNP LEVELS IN PREDICTING THE PROGNOSIS IN ACUTE CORONARY SYNDROME

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ABSTRACT Acute coronary syndrome (ACS) is a major cause of mortality and morbidity worldwide. Despite advances in intervention and diagnostics, predicting long-term outcomes remains a challenge. NT-proBNP, a biomarker derived from ventricular myocytes in response to myocardial strain, may provide valuable prognostic information. This study evaluates NT-proBNP levels measured within 24 hours of symptom onset in ACS patients and correlates these levels with adverse outcomes during a 6-month follow-up. A total of 52 patients under 60 years of age with first-time ACS were enrolled. NT-proBNP levels were categorized as minimal (<100 pg/ml), moderate (100-500 pg/ml), and marked (>500 pg/ml) elevation. Elevated NT-proBNP was significantly associated with recurrent angina, palpitations, dyspnea, hospital readmission, and cardiac dysfunction. These findings support the use of NT-proBNP as a valuable tool in prognostication following ACS.

KEYWORDS : NT-proBNP, Acute Coronary Syndrome, Prognosis, Biomarker, STEMI, NSTEMI, Unstable Angina

INTRODUCTION

Cardiovascular diseases account for over 30% of global deaths, with ischemic heart disease being the leading cause. Acute Coronary Syndromes (ACS), comprising unstable angina (UA), non-ST elevation myocardial infarction (NSTEMI), and ST elevation myocardial infarction (STEMI), are critical clinical emergencies. Biomarkers play a central role in diagnosis, but prognostic markers remain underutilized. NT-proBNP, the N-terminal fragment of pro-brain natriuretic peptide, is secreted in response to myocardial wall stress and has a longer half-life than BNP, making it suitable for prognostic evaluation. This study aims to assess whether NT-proBNP levels measured within 24 hours of ACS onset can predict future cardiac events, deterioration in cardiac function, or death in a South Indian cohort.

Objectives

- To assess the significance of NT-proBNP elevation in patients presenting with ACS.
- To evaluate its correlation with subsequent events including recurrent angina, dyspnea, hospital readmissions, left ventricular dysfunction, renal dysfunction, and mortality.

MATERIALS AND METHODS

Study Design: Prospective Observational Study

Population: 70 patients screened; 52 patients aged 35-60 years with first-time ACS enrolled.

Inclusion Criteria:

- Age <60 years
- Diagnosis of STEMI, NSTEMI, or Unstable Angina

Exclusion Criteria:

- Age >60
- Known renal failure, anemia, or valvular heart disease

Methodology:

NT-proBNP levels were measured within 2–24 hours of symptom onset using a rapid fluorescence immunoassay. Patients were followed up for 6 months for recurrent symptoms, rehospitalization, and adverse events. Echocardiographic parameters and renal function were re-evaluated.

RESULTS

Demographics: 38 males and 14 females. 14 UA, 3 NSTEMI, 35 STEMI cases.

NT-proBNP Levels:
- Minimal (<100 pg/ml): 26.9%
- Moderate (100–500 pg/ml): 44.2%
- Marked (>500 pg/ml): 28.8%

Association with ACS Type:
- Elevated NT-proBNP in 80% STEMI, 66.6% NSTEMI, and 57.2% UA patients.

Correlation with Symptoms:
- Recurrent Angina: Significant correlation (p=0.002)
- Palpitations: Significant correlation (p=0.015)
- Dyspnea: Significant correlation (p=0.001)
- Hospital Admissions: 75% of patients with NT-proBNP >500 pg/ml were readmitted
- Mortality: Observed only in >500 pg/ml group

Table 1: NT-proBNP levels vs. Clinical Outcomes

NT-proBNP (pg/ml)	Angina	Palpitations	Dyspnea	Readmissions	Deaths
<100	3	1	0	1	0
100-500	14	5	12	8	0
>500	13	8	10	11	2

DISCUSSION

NT-proBNP levels were significantly elevated in patients with more severe forms of ACS and strongly predicted adverse outcomes. Previous trials (GUSTO-IV, OPUS-TIMI, FRISC-II) confirm that elevated BNP is linked to poor prognosis. This study confirms these findings in an Indian population under age 60. NT-proBNP is unaffected by anemia or renal failure in this cohort, making it a reliable independent marker. Elevated NT-proBNP identifies high-risk patients who may benefit from more intensive therapy and follow-up.

CONCLUSION

NT-proBNP is a valuable prognostic biomarker in acute coronary syndromes. Patients with levels >100 pg/ml are at significantly higher risk for recurrent angina, dyspnea, rehospitalization, and mortality. Routine measurement may guide post-discharge monitoring and therapeutic strategies.

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