

# Clinical Significance of Troponin T values in Chronic Kidney Disease patients presenting with Acute Coronary Syndrome

Nimisha Venugopal<sup>1</sup>; Dan Lythgoe<sup>2</sup>; Dr Bhavna Pandya<sup>3</sup>

<sup>1</sup>Medical Student, University of Liverpool; <sup>2</sup>Statistician in Medical Statistics, Liverpool Cancer Research UK Centre;

<sup>3</sup>Consultant Nephrologist and Honorary Clinical Lecturer, Aintree University Hospital

## INTRODUCTION AND AIMS

- Cardiovascular disease contributes significantly to morbidity and mortality within the Chronic Kidney Disease (CKD) population.<sup>1</sup>
- Troponin T is a cardiovascular marker used to diagnose Acute Coronary Syndrome (ACS). High sensitivity Troponin T assay (hsTnT) level above 14 ng/L is considered diagnostic for ACS.<sup>2</sup>
- CKD patients are noted to have chronically elevated levels of Troponin T. Thus clinicians are unsure how to interpret troponin T values in CKD patients presenting with a history of acute chest pain.
- Several studies including the AUCITY trial has shown that troponin T levels can predict short-term and long-term cardiac outcomes in CKD patients presenting with ACS.<sup>3</sup>
- This study aims to specify a diagnostic threshold of hsTnT in order to accurately diagnose and predict a cardiac outcome in CKD patients.

## METHODS

- A retrospective cohort study was conducted from January 2011 to December 2012. From 6149 requested samples, only 1053 CKD stage 3 and above patients details were included in the study due to time constraints. All these patients had an initial hsTnT >14ng/L.
- Basic demographic and relevant co-morbidities details were collected.
- A new diagnostic cut-off troponin T value was estimated by plotting a Receiver Operator Characteristic (ROC) curve.
- A Kaplan Meier curve compared survival rates within these patients using the new cut-off value.
- A Cox regression analysis evaluated whether common risk factors contributed significantly to a cardiac outcome.

## RESULTS

Table 1: Baseline characteristics in 1053 patients

Age, median (CI)	80 (73-85) years
Male, n (%)	415 (39.4%)
Dialysis, n (%)	38 (3.6%)
Diabetes, n (%)	241 (22.9%)
Co-morbid cardiac disease	
Ischaemic Heart Disease, n (%)	575 (54.7%)
Hypertension, n (%)	544 (51.7%)
Heart Failure, n (%)	221 (21.0%)
Atrial Fibrillation, n (%)	250 (23.8%)
Cerebrovascular Accident, n (%)	99 (9.4%)
Transient Ischaemic Attack, n (%)	42 (4.0%)
Peripheral Vascular Disease, n (%)	16 (1.5%)
Arrhythmias, n (%)	43 (4.1%)
Valvular Disease, n (%)	88 (8.4%)
Study Outcomes	
Cardiac outcome, n (%)	174 (16.4%)
Death, n (%)	313 (29.8%)
Cardiac Death, n (%)	48 (4.6%)
Median	30 ng/L

Table 1: Basic demographic details of all patients in the study. Median reported for those with a skewed distribution.

Table 2: Number of CKD patients with hsTnT <14ng/L from 2011-2012

	CKD 3A	CKD 3B	CKD 4	CKD 5	% of study sample
2011 (n=3556)	458	134	25	1	19.6
2012 (n=2593)	391	86	22	1	21.9

Table 2: Number of CKD patients with hsTnT levels <14ng/L.

## SUGGESTED CUT-OFF TROPONIN-T VALUE

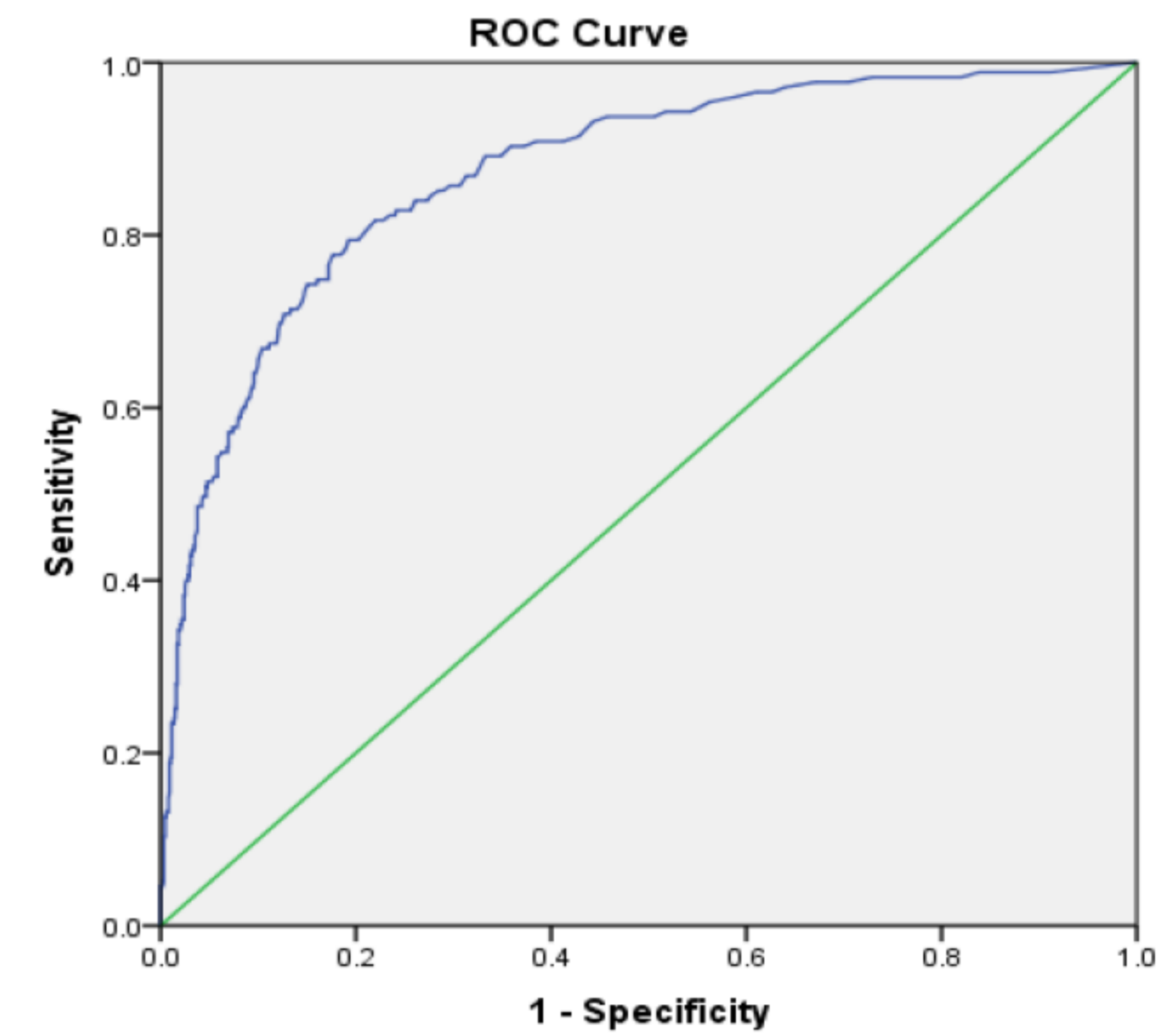


Figure 1: ROC curve of hsTnT to diagnose a cardiac outcome in CKD patients. Area under curve: 0.87

- A cut-off value for hsTnT to diagnose ACS was evaluated using a ROC curve (Figure 1)
- A value of 58.5ng/L was found to have the highest sensitivity (79.4%) and specificity (79.7%) for predicting an acute cardiac outcome.

## SURVIVAL RATES AND RISK FACTORS

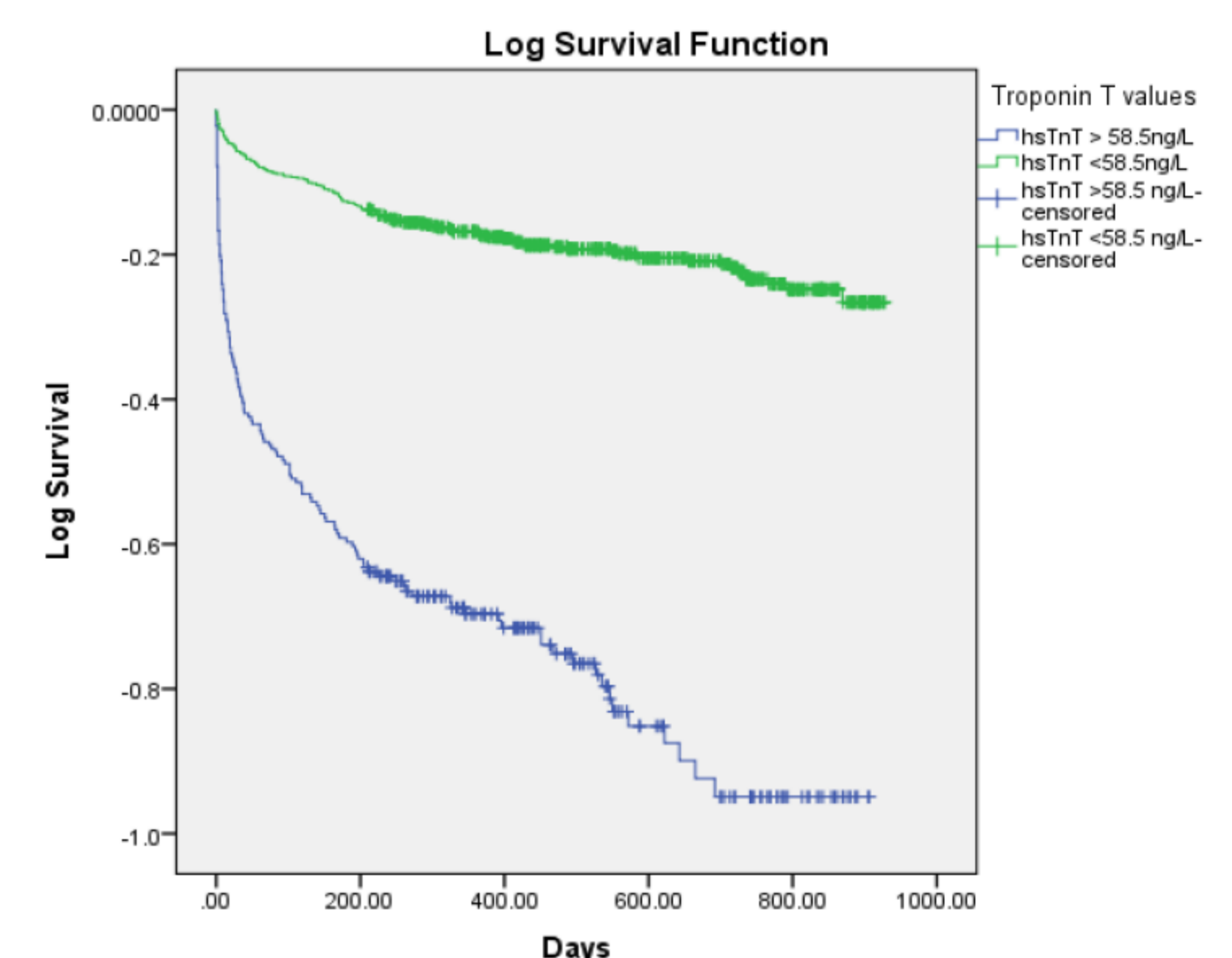


Figure 2: Kaplan Meier survival curve showing survival rates in patients with hsTnT above and below 58.5ng/L

- Figure 2 showed a worse cardiac outcome in the group with hsTnT>58.5ng/L, which is statistically significant (p <0.001).
- The mean number of days until a death in the group with hsTnT <58.5ng/L is 778 days and for the group with hsTnT>58.5ng/L is 440 days.
- The Cox Regression analysis showed that only hsTnT was significantly associated with a cardiac outcome (Hazard Ratio: 13.5)

## DISCUSSION

- This study showed that CKD patients are not always associated with increased troponin T level.
- A hsTnT level >58.5ng/L can be used as a predictor for ACS within the CKD population
- There is reduced survival for patients with hsTnT > 58.5ng/L compared to patients with a level <58.5 ng/L
- Troponin levels are significantly associated with all-cause mortality within these patients.

## REFERENCES

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