

## Relationship between quantitative value of High-sensitivity Troponin I and severity of CAD in patients with stable CAD

I.A.Mohammed, K.E.Elrabat, S.A.Moustafa and H.I.Allam

Cardiovascular medicine, Dept., Faculty of Medicine, Benha Univ., Benha, Egypt

E-mail: sefanna1990@gmail.com

### Abstract

Chest pain is one of the most often reported symptoms in outpatient practise and poses a formidable diagnostic challenge. Patients in a stable condition who complain of chest pain may exhibit a variety of nonspecific symptoms and indications, posing a diagnostic problem. Our study's objective was to explore the relationship between the quantitative value of high-sensitivity troponin I (hsTnI) and the severity of coronary artery disease (CAD) in stable, symptomatic outpatients with suspected CAD undergoing coronary computed tomography angiography (CTA). Methods: Our research was done at a single location. This research was done on 250 patients with suspected CAD who came to the Cardiology department at Elahrar Teaching Hospital. regards age, gender, and risk factors, there was no difference between the groups tested. The high sensitivity troponin level was greater in group I,  $p < 0.001$ . Increasing hs troponine levels were related with the existence of coronary artery disease in patients with stable chest discomfort.

**Key words:** Hs, TroponinI, ICTA stable CAD.

### 1. Introduction

Chest pain is one of the most prevalent symptoms in outpatient care and poses a significant diagnostic difficulty. Traditional risk factors for coronary artery disease (CAD) are crucial for disease progression, but their contribution to clinical decision-making in the setting of symptoms is limited. [1] Advantages of coronary CTA include high sensitivity and negative predictive value (NPV) for obstructive CAD; coronary CTA also enables the identification and quantification of coronary artery calcium (CAC), a diagnostic and prognostic finding in patients with chest pain [3].

Coronary CTA may also give extra prognostic information by detecting CAD that is not obstructive [4].

Beyond imaging, the creation of circulating biomarkers to aid in the diagnosis of individuals with probable stable obstructive coronary artery disease (CAD) [2].

The objective of this study is to explore the relationship between the quantitative value of high-sensitivity troponin I (hsTnI) and the severity of coronary artery disease (CAD) in stable, symptomatic outpatients with suspected CAD who are undergoing coronary computed tomography angiography (CTA).

### 2. Patients and Methods

#### 2.1. Study design

It was a single-center research done at Elahrar Teaching Hospital's Cardiology department.

#### 2.2. Statistical analysis

Statistical package for Social Science (IBM Corporation, 2017) was used to analyse the gathered

The current study included 250 stable outpatients undergoing coronary CT angiography .

#### 2.3. Inclusion criteria

Adult patients of both sexes with Stable outpatients undergoing coronary CTA for diagnosis of suspected CAD

#### 2.4. Exclusion criteria

- 1) Severe renal diseases
- 2) Prior PCI and CABG within one year
- 3) Age < 18 years
- 4) Patients with known CAD (either by history , ECG, ECHO, coronary CT or coronary angiography)

#### 2.5. Methodology

##### Ethical consideration

The protocol was approved by the ethical committee of department of cardiology Benha university .

##### All included patients were subjected to the following

1. Informed consent.
2. Complete history taking.
3. 12 lead ECG .
4. 2D conventional Echocardiography.
5. Laboratory analysis: s-creatinine, Tn concentration
6. Coronary computed tomography to detect presence of obstructive CAD .

data. IBM SPSS Statistics for Windows, Version 25.0 (Armonk, New York: IBM Corporation, 2005).

A P-value < 0.05 was considered statistically significant.

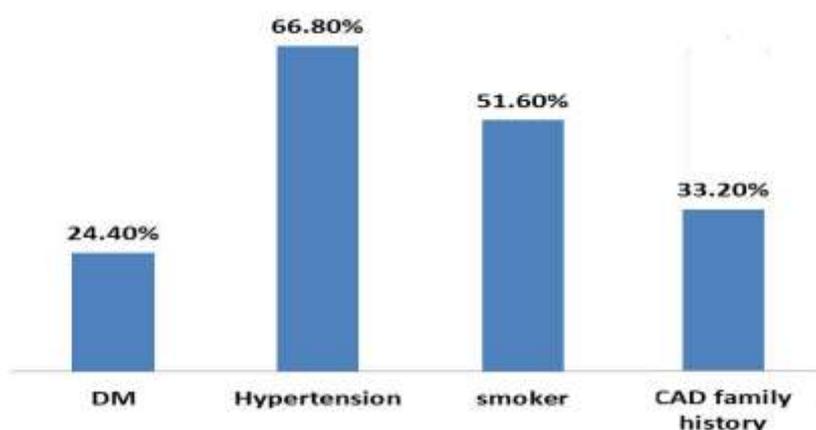
### 3. Results

The mean age of the 250 patients enrolled during the study was  $59.4 \pm 5.5$ . 51.4% of the patients were male and 48.6% were female.

Among all studied cases, 61 patients (24.4%) were diabetic, 167 patients (66.8%) were hypertensive, 129 patients (51.6%) were smokers, 164 patients (65.6%) were dyslipidemic, and 83 patients (33.2%) had positive family history of CAD.

**Table (1)** Risk factors of CAD among all studied cases.

		Cases N=250	
		Mean/Count	SD/%
DM	N,%	61	24.4%
Hypertension	N,%	167	66.8%
Smoker	N,%	129	51.6%
Family history of premature CAD	N,%	83	33.2%



**Fig. (8)** Risk factors of CAD among all studied cases.

#### Correlation between all studied parameters and CAD presence:

There was no difference between studied groups as regarding age & gender II ( $P$  value  $> 0.05$ ).

No differences were observed between studied groups as regard History of DM and History of HTN ( $P$  value = 0.209). Incidence of smokers were not different. Also no difference between groups in incidence of dyslipidemia and history of premature CAD II ( $P$  value  $> 0.05$ ).

High sensitivity troponin was high in group I compared with group II,  $p$  value  $< 0.05$ .

### 4. Discussion

Coronary atherosclerosis can progress at varying rates, ranging from a gradual increase in luminal narrowing to a sudden progression to total luminal occlusion, with the latter typically resulting from the disruption of a vulnerable nonstenotic plaque due to rupture or erosion and subsequent thrombosis.

In our investigation, there were no differences between patients based on age, gender, diabetes, hypertension, smoking, or history of early coronary artery disease.

Omland et al. research was comparable to ours in terms of age and cardiovascular risk factors.

Both high sensitivity cardiac troponin I and T were related with cardiovascular risk variables in a research by Welsh et al.

Given past research demonstrating a link between hs troponin and the occurrence of CAD in patients

without acute coronary syndrome, this study aimed to confirm this relationship.

Januzzi et al. believed that the troponin concentration determined using a high sensitivity molecular assay would be beneficial.

Caselli et al., who evaluated 378 patients with stable angina and unclear CAD status, analysed the patients. Concentrations of hs troponin were shown to be greater in individuals with coronary artery disease.

In addition, Lee et al., who evaluated patients undergoing functional testing using stress nuclear imaging, concluded that elevated levels of the marker are associated with a larger ischemia load.

### 5. Conclusion

In patients with stable chest discomfort, increasing hs troponin concentrations were related with the existence of coronary artery disease.

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