

To Study the 99th Percentile Upper Reference Limit of High Sensitive Troponin T in adult population of Multan

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ABSTRACT

Aim: To determine 99th percentile upper reference limit of high sensitive Troponin T in adult population of Multan

Methodology: A cross sectional study conducted in the department of chemical pathology, CMH, Multan from September 2021 to March 2022. Approval by the institutional review board was taken. Sample size was 265 cases.

Results: Mean age was 46.2 ± 12.7 years. 131 (49.6%) were females and 134 (50%) were males. In 265 cases, there were 210 (79.24%) cases who had hs-TnT level of >2.99 ng/L and 55 (20.75%) have values of hs-TnT <3.0 ng/L. Cases having a level of <3.0 were assigned a value of 2.9 ng/L for statistical analysis. Kruskal-Wallis test was used to analyze significance in troponin level regarding age and gender. hs-cTnT values were found statistically significant between genders while non significant difference between age groups.

Conclusion: hs-cTnT value was 18.20 ng/L in the study cases while these values were 30.46ng/L for males and 16.77ng/L for females. It is concluded that overall 99th percentile values of hs-cTnT are significantly higher among men as compared to women.

Key words: High sensitive Troponin T, Adults, percentile

INTRODUCTION

According to WHO report, IHD was the main cause of death in 2019 in whole world. It causes about 8.9 million casualties. Cardiovascular diseases (CVD) are the leading cause of death worldwide¹. The markers of importance in diagnosis of acute MI and risk groups are cardiac troponins. The myocardial injury may be acute if there is a rise and/or fall of troponin T value². Protein of actin filaments of both cardiac and skeletal muscles is troponin. The troponin has three subunits i.e. Troponin C (TnC), troponin I (TnI) and Troponin T (TnT). The function of troponin T is binding of tropomyosin³.

METHODOLOGY

This was a cross sectional study conducted in the department of chemical pathology, CMH, Multan from September 2021 to March 2022. Approval by the institutional review board was taken. Non probability convenient sampling technique was employed for sample collection.

Selection Criteria: The adult cases with age of 18-45 years, who did not have any known cardiovascular disease (CVD) or risk factor as well as family history of CVD were included. Informed written consent was taken. Pulse rate, blood pressure and auscultation of the chest and ECG of all cases were done. NT-pro BNP, eGFR and HbA1c assay were also done for any underlying co-morbidities. Patients with examination and ECG findings and those with NT pro-BNP >125 , HbA1c $>6.5\%$ and eGFR <60 ml/min/1.73m² were excluded from the study. 3ml blood was taken in EDTA vials. Preci control Troponin were used for quality assurance. Statistical analysis was done by using SPSS-21. Data was assessed by Kolmogorov-Smirnov test.

RESULTS

Mean age was 46.2 ± 12.7 years. There were 131 (49.6%) females and 134 (50.4%) males. In 265 cases, 210 (79.24%) cases demonstrated a level of hs-cTnT >2.99 ng/L and 55 (20.75%) have values of hs-cTnT <3.00 ng/L which is below the analytical sensitivity of assay. Cases with a level of <3.0 were assigned a value of 2.9 ng/L for statistical analysis.

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Table 1: High sensitivity troponin (hs-TnT) between male and female cases

	Gender	N	Median± IQR
Hs-TnT (ng/L)	Male	134	4.81±3.88
	Female	131	4.19±2.92

P value 0.041

Table 2: Age wise differences of hs-TnT levels

Age (yrs)	N	Median± IQR	p-value
>40	194	4.11±3.07	0.694
<40	71	4.81±3.23	

Table 3: 99th percentile complete data, male and female groups

	Median	99 th percentile (units)
All cases (265)	4.57	18.20
Males (134)	4.85	36.40
Females (131)	4.19	16.77

DISCUSSION

The levels of high sensitivity troponin T (hs-TnT) in our study were 18.20ng/L in overall cases while these values were 30.46ng/L for males and 16.77ng/L for females. These findings were in favor of a study done in Singapore and reported 99th percentile cut-off value of 25.6ng/L for overall and 32.7ng/L and 17.9ng/L for male and female respectively⁴. Our study is also consistent with results of a study done in USA where 99th percentile URL ranged from 18.4–20.2ng/L in overall cases⁵.

In another study, the value of 99th percentile URL was higher in males when comparing with females⁶. A study carried out in Germany on hs-cTnT found this cut off to be 19.2ng/L for males and 13.1 ng/L for females⁷.

Another study showed TnT in three large cohorts and found this cut-off to be higher in males and also increased with age⁸. Romiti et al⁹ have done a comparison of different studies which observed sex-specific 99th percentile cut-offs for hs-cTnT and found higher values in men. A study has shown that using sex-specific 99th percentile cut-off improved identification of women at risk of major adverse cardiac events¹⁰.

Regarding age, cases were mostly middle aged with mean age of 46.2 ± 12.7 . Elderly patients have higher troponin values even in the absence of acute coronary syndrome or other abnormalities like diabetes and hypertension¹¹. Effect of age on the values of 99th percentile URL is well observed by another study¹². In our study, age group showed no significant difference.

CONCLUSION

High sensitivity troponin (hs-TnT) value was 18.20ng/L in overall study cases while these values were 30.46ng/L for males and 16.77ng/L for females. It is concluded that 99th percentile values of hs-TnT are significantly higher in males when comparing with females.

Conflict of interest: Nil

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