



## Original Article

# A study on normal reference values of echocardiographic chamber dimensions in young eastern Indian adults



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## ABSTRACT

**Objective:** Various studies have shown racial differences in adult cardiac chamber measurements by echocardiography. There is lack of any large scale data from India regarding the echocardiographic chamber measurements in cardiologically healthy individuals. In this study we present the normal reference values of echocardiographic chamber dimensions in young eastern Indian adults and compare it with the data in present guidelines and recent studies involving Indian subjects.

**Methods:** This study was performed on 1377 healthy adults aged 18–35 years. Standard transthoracic echocardiographies were performed to obtain basic measurements. All measurements were indexed to body surface area.

**Results:** The mean maximal aortic valve cusp separation (ACS) and indexed ACS were significantly more in females ( $p = 0.002$ ,  $p = 0.03$ ). Mean left ventricular (LV) ejection fraction (LVEF) and LV fractional shortening were marginally higher in females. Upper normal reference limit of LV end diastolic dimension (LVEDd) is slightly more for males. Comparing to ASE data, LVEDd, LV end systolic dimension, LV end diastolic volume, indexed LV end systolic volume, left atrial anteroposterior dimension, aortic root dimension and right ventricle outflow diameter were significantly lower in study population while LVEF was significantly higher ( $p < 0.0001$ ).

**Conclusion:** The study reconfirms that Indian subjects have smaller cardiac chamber measurements compared to western population where as LVEF is higher in the Indian population and also demonstrates the wide variation of normal echocardiographic measurements within Indian subcontinent. No previous data from eastern India makes this research a singular experience.

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## 1. Introduction

Echocardiography is the basic, most important and most commonly used instrument for assessing cardiac structure and function.<sup>1</sup> Management decisions of many cardiac as well as non-cardiac patients depend on echocardiography results. The normal ranges of echocardiographic parameters vary according to age, body surface area (BSA), gender and race.<sup>2,3</sup> Various studies have shown racial differences in adult cardiac chamber measurements

by echocardiography.<sup>2,4</sup> Normal ranges for echocardiographic parameters have been published in many guidelines. The European Association of Cardiovascular Imaging (EACVI) and the American Society of Echocardiography (ASE) published the latest recommendations for echocardiographic chamber measurements in 2015 which was endorsed by several echocardiography societies around the globe.<sup>1</sup> A pilot study of 100 healthy volunteers from India was conducted by Bansal et al which showed Indian subjects have some differences in cardiac chamber quantifications as compared to the western populations.<sup>5</sup> Till date no study has been done from eastern India regarding normal echocardiographic chamber quantifications of subjects from this part of the country. In fact there is lack of any nationally representative sizeable database data from Indian sub-continent which gives an idea regarding the echocardiographic chamber measurements in cardiologically healthy individuals from this part of the world. Therefore it is of scientific

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## A STUDY OF RELATIONSHIP BETWEEN CAROTID INTIMA MEDIAL THICKNESS AND SYNTAX SCORE

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### ABSTRACT

**Background:** Carotid intima medial thickness (CIMT) is a well known surrogate marker of atherosclerotic burden and cardiovascular disease risk. CIMT has been reported to correlate with the extent of atherosclerotic lesions in the coronary arteries. The SYNTAX score is an angiographic tool for grading coronary lesion complexity and is also used as a predictor of clinical outcomes in patients with single or multivessel coronary artery disease. Hence, patients with increased CIMT might have more complex coronary artery disease anatomy as assessed by SYNTAX Score. **Objectives:** The main purpose of this study was to investigate whether any relationship existed between CIMT and coronary artery disease complexity as assessed by SYNTAX score among Indian coronary artery disease patients. **Method:** 100 consecutive patients (male 61, female 39; median age 59.4 years  $\pm$  9.5) who underwent coronary angiography for the first time based on clinical indication for chronic stable angina or acute coronary syndrome were taken up for CIMT assessment. The SYNTAX scores were assessed by two cardiologists by using the algorithm available on the SYNTAX website. The CIMT values of the right and left sides were measured at 3 segments: the distal common carotid (1 cm proximal to dilation of the carotid bulb), the carotid artery bifurcation (1 cm proximal to the flow divider) and the proximal internal carotid artery (1 cm section of the internal carotid artery immediately distal to the flow divider). At each of these 3 segments, 5 measurements of the far wall were done and the mean CIMT of the right and left carotid arteries were calculated. The presence of carotid plaques if any was also noted. **Results:** In our study group of 100 subjects, the average SYNTAX score was  $14.27 \pm 10.25$ , whereas the mean CIMT (taking the higher value of left and right side) was  $0.96 \text{ mm} \pm 0.28$  mm. Running a regression analysis we could demonstrate a statistically significant association between CIMT and SYNTAX score (P-value = 0.0112). We also found a statistically significant association between the presence of plaques in the carotid arteries and SYNTAX score (P-value = 0.027). By regression analysis we also found statistically significant correlation between SYNTAX score and diabetes mellitus (P-value = 0.006) and smoking (P-value = 0.034). **Conclusion(s):** Our study showed a statistical significant association between CIMT and SYNTAX score. From a clinical point of view, results from our study indicate that patients with higher CIMT values may have more complex coronary artery lesions and CIMT may be considered a reliable parameter to predict the SYNTAX score among Indian coronary artery disease patients.

### KEYWORDS:

### INTRODUCTION

The Indian subcontinent is in the midst a of cardiovascular disease (CVD) epidemic. Coronary heart disease (CHD) has now become the leading cause of death in India.<sup>[1,2]</sup> The annual number of deaths from CVD in India is projected to rise from 2.26 million in 1990 to 4.77 million by 2020.<sup>[3]</sup> Thus effective screening, evaluation and management strategies for CHD are extremely important and need of the hour in India.

An extremely cost-effective and effort-effective strategy is to identify high-risk asymptomatic patients in the

general population to prevent mortality and morbidity due to CVD.<sup>[4,5]</sup> Measurement of carotid intima medial thickness (CIMT) with a B-mode ultrasonography is a valid approach for identifying and quantifying the presence of subclinical atherosclerosis. It is a noninvasive, sensitive and reproducible technique for identifying and quantifying atherosclerotic burden and CVD risk. It is also a well validated research tool that has been translated into clinical practice.<sup>[6,7]</sup>

In our study, the relationship between CIMT and the presence or absence of CAD has been investigated. Also



## TO EVALUATE THE PLATELET FUNCTION IN PATIENTS OF ACUTE CORONARY SYNDROME RECEIVING DUAL ANTI-PLATELET THERAPY

### Cardiology

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### ABSTRACT

**INTRODUCTION:** Cardiovascular diseases are one of the leading cause of death in the world. Several factors have led to the increase in vascular disorders, including the aging population, unhealthy lifestyles, increasing rates of diabetes and raised lipids, and further risk factors resulting in inflammation and calcification of the vascular endothelium. Activated platelets in damaged blood vessels can trigger arterial thrombus formation, leading to vascular occlusion with subsequent organ hypoperfusion and clinical manifestation of myocardial infarction, stroke, or peripheral artery disease. **AIMS AND OBJECTIVES:** To evaluate platelet function in patients of Acute Coronary Syndrome 12hrs after loading dose of dual anti-platelet agents and evaluate platelet function in patients of Acute Coronary Syndrome on maintenance dose of dual anti-platelet agents in steady state. **MATERIALS AND METHODS:** 41 Adult Patients of both sexes admitted in Department of Cardiology, NRS Medical College and Hospital, a tertiary care hospital from 1ST FEBRUARY 2016 TO 31ST JULY 2017 (18months). **RESULT AND ANALYSIS:** In our study 51.2% were hypertensive. The study population were varied when it comes to occupation. Our study population consisted of 56.1% smokers and 43.9% non-smokers. The mean height of the study population was 165.8 cm. The maximum height was 180cm. The minimum height was 150cm. The mean weight of the study population was 61.36kg. The maximum weight was 76kg. The minimum weight was 49kg. The mean BMI was 22.36. The maximum was 27.77. The minimum was 18.56. Our study population consisted of 51.2% patients of Type II Diabetes Mellitus. **CONCLUSION:** This study was undertaken to assess the extent of Aspirin and Clopidogrel non-responsiveness in patients of Acute Coronary Syndrome. If non-responders are detected early particularly Clopidogrel non-responders, we can change the outcome with change of P2Y<sub>12</sub> receptor antagonist at an early stage. Although most of the recent guidelines do not recommend routine platelet function testing but almost all studies show a strong association.

### KEYWORDS

Platelet Function, Acute Coronary, Syndrome And Dual Anti-Platelet Therapy

#### INTRODUCTION

Cardiovascular diseases are one of the leading cause of death in the world. Several factors have led to the increase in vascular disorders, including the aging population, unhealthy lifestyles, increasing rates of diabetes and raised lipids, and further risk factors resulting in inflammation and calcification of the vascular endothelium. Activated platelets in damaged blood vessels can trigger arterial thrombus formation, leading to vascular occlusion with subsequent organ hypoperfusion and clinical manifestation of myocardial infarction, stroke, or peripheral artery disease.

Activated platelets play a pivotal role in the pathogenesis of acute coronary syndrome (ACS) and are a major concern in relation to ischemic complications following percutaneous coronary intervention (PCI)<sup>1</sup>. Even though stent thrombosis (ST) is a rare event, it is a severe or fatal complication and is associated with high mortality rates<sup>2</sup>. Dual antiplatelet therapy consisting of aspirin and a P2Y<sub>12</sub>- inhibitor (clopidogrel, prasugrel, or ticagrelor) is state-of-the-art therapy in ACS patients undergoing PCI for prevention of ischemic adverse events. This therapy is maintained for 1 year in the majority of patients undergoing PCI. However, inter-individual response to platelet inhibiting drugs has led to treatment failure in selected patients: up to 25% of patients respond inadequately to clopidogrel and around 10% have an inadequate response to aspirin. The reason for this is multifactorial: genetic factors, drug interactions, altered drug absorption, diet, age, lack of compliance, lifestyle, co-morbidities, and platelet turnover may contribute to insufficient drug efficacy. The phenomenon of clopidogrel low responsiveness or 'resistance', which is also termed high on-treatment platelet reactivity (HPR), has been associated with an increased risk of ischemic complications, including ST<sup>3</sup>. Several publications and meta-analyses have also reported the increased incidence of arterial ischemia with 'aspirin resistance'<sup>4</sup>.

Moreover, most of the benefit seen with prasugrel versus clopidogrel treatment in ACS patients with regard to thrombotic risk reduction was

seen in the early and acute periods of treatment<sup>5</sup>. As a consequence, strategies to optimize P2Y<sub>12</sub> receptor-directed antiplatelet treatment beyond the acute phase and during the maintenance phase of treatment may significantly improve the outcome for ACS patients undergoing PCI. It is also important to mention that both prasugrel and ticagrelor are significantly more costly than treatment with generic clopidogrel.

#### AIMS AND OBJECTIVES SPECIFIC OBJECTIVES

1. To evaluate platelet function in patients of Acute Coronary Syndrome 12hrs after loading dose of dual anti-platelet agents.
2. To evaluate platelet function in patients of Acute Coronary Syndrome on maintenance dose of dual anti-platelet agents in steady state.

#### MATERIALS AND METHODS STUDY AREA

N.R.S Medical College and Hospital, Kolkata.

#### STUDY POPULATION

Adult Patients of both sexes admitted in Department of Cardiology, NRS Medical College and Hospital, a tertiary care hospital.

#### STUDY PERIOD

From 1ST FEBRUARY 2016 TO 31ST JULY 2017 (18months)

#### SAMPLE SIZE

41 patients.

#### SAMPLE DESIGN

Simple random selection

#### STUDY DESIGN

Cross sectional, analytical, single hospital based study.



## Review Article

## Cardiological society of India position statement on COVID-19 and heart failure



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## Review Article

Cardiological Society of India: Document on acute MI care during COVID-19<sup>☆</sup>

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## ABSTRACT

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The unprecedented and rapidly spreading Coronavirus Disease-19 (COVID-19) pandemic has challenged public health care systems globally. Based on worldwide experience, India has initiated a nationwide lockdown to prevent the exponential surge of cases. During COVID-19, management of cardiovascular

<sup>☆</sup> The Cardiological Society of India (CSI) acknowledges the sincere efforts of all the various bodies (viz. your institute or hospital, local and state health authorities, Ministry of Health and Family Welfare and the ICMR) in devising response plans to contain, mitigate and suppress this pandemic. The purpose of this guidance statement is to supplement, not to override, valuable guidance from these bodies.

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## Original Article

## Changing pattern of admissions for acute myocardial infarction in India during the COVID-19 pandemic



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## Original Article

## Pattern of acute MI admissions in India during COVID-19 era: A Cardiological Society of India study - Rationale and design



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**Abbreviations:** COVID 19, corona virus disease of 2019; AMI, acute myocardial infarction; ACS, Acute coronary syndrome; STEMI, ST elevation myocardial infarction; NSTEMI, non-STEMI; CSI, cardiology society of India; ICMR, Indian council of medical research; GCP, good clinical practice.

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