

higher SBP, DBP, serum triglycerides, total cholesterol, LDL cholesterol but significantly lower GFR ( $62.3 \pm 14.1$  vs  $70.1 \pm 14.9$ ,  $p = 0.010$ ) compared to patients without MS. They were also having significantly high BMI ( $26.8 \pm 3.9$  vs  $23.8 \pm 4.8$ ), mid upper arm circumference, waist circumference, waist hip ratio (WHR), waist height ratio ( $0.63 \pm 0.07$  vs  $0.55 \pm 0.05$ ,  $p < 0.001$ ), and conicity index ( $1.42 \pm 0.07$  vs  $1.33 \pm 1.09$ ,  $p = 0.001$ ) compared to patients without MS. Prevalence of each component of the IRS in cases is much higher than in control (34% vs 8.5%). There is also definite urban/rural difference (35% vs 19%). Same is true for higher/lower socioeconomic group (36% vs 23%).

**Conclusion:** Metabolic syndrome was highly prevalent (74%) in north Indian CAD patients particularly in urban and upper class populations. Patients with MS were significantly older, had significantly higher lipid values, higher BMI, WHR, waist height ratio, and conicity index but lower GFR. Clustering of components (DM, HTN, dyslipidemia) increases the prevalence of insulin resistance. Possibly IRS causes common soil for development of both DM and CAD. BMI ( $>25$ ), GFR ( $<60$ ), and conicity index were the significant factors predicting MS.

### CAD in young – A neglected and underdiagnosed issue: Emphasis on risk factors



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**Background:** CAD in India is having one of the highest prevalence in the world. In various studies it is approaching approximately 11% in the urban population and 7% in the rural population across India. Though it is more prevalent at older age group, our present observation has been that, younger populations have been increasingly affected. Due to their young age quite often they have been underdiagnosed.

**Objective:** Here in this study we tried to find out the specific causes of CAD young. We also looked at the frequency of missed diagnosis during first medical contact.

**Method:** It was a retrospective study, where we included all CAD patients younger than 35 years of age. Both chronic stable angina and ACS/AMI group was included after angiographically proven lesion  $>50\%$  stenosis.

**Results:** We enrolled a total of 32 patients in the last 2 years. 28 patients underwent angiograms and 4 underwent CT angio. It was found that there is a strong male preponderance among the younger subsets of CAD. Among all, 28 (88%) patients were male. The youngest in pool was 17 years of age who was presented with STEMI. The risk factors included smoking, hypertension, and DM among conventional risk factors. hs-CRP was very high in all the patients in whom it was measured (30 patients). Five patients (15%) of them had family history of premature CAD. Lp(a) was measured in all patients and the level was high in 50% patients. Fifteen patients were found not to have any conventional risk factor. Lp(a) was although high in all of them. One of the surprising finding was high incidence of CAD among the IT sector workers especially who work at call centers and having regular night duties. We treated one female patient who presented with inferior wall MI, and angio revealed spontaneous coronary dissection. Two patients had HIV, though both of them also had smoking as a risk factor to confound with. Two patients had isolated morbid obesity as risk factors; both of them had high hs-CRP also.

An interesting finding we found during the study is that significant number of patients have been refused by physicians to undergo

cardiac evaluation despite patients wanting for the same. In 2 patients, diagnosis of myocardial infarction was missed initially. **Conclusion:** In the epidemic of CAD, the younger subsets are being increasingly affected. Other than the conventional CAD risk factors, additional factors found to be associated with young CAD includes: high hs-CRP, high Lp(a), IT sector job holders, call center workers, night duties, stress, HIV, and isolated morbid obesity. Any patient coming with classical chest pain/angina equivalent, especially if associated with above-mentioned risk factors, should have proper CAD evaluation irrespective of their age.

### Perspectives on the presentation, treatment, and outcomes of acute coronary syndromes in India: A prospective analysis of registry data from a major center in Uttar Pradesh



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**Background:** Despite India being the CAD capital of the world, no large study in recent past has been conducted on the patterns of presentation and management of coronary syndrome in largest study of India, Uttar Pradesh. Present study was conducted to highlight the same problem and recent trends in presentation and management of ACS patients in a major tertiary center of Uttar Pradesh catering to a large population.

**Methods:** We did a prospective registry study in the Department of Cardiology. All 3500 successive patients presenting with acute coronary syndrome to the Emergency Department between July 2014 and August 2015 were included and data analysed for various factors.

**Results:** Out of all patients, 11% were young patients of  $<40$  years age, 28% were diabetics, 33% were hypertensives, and 17% had BMI  $>30$ . Of all ACS, 61% had NSTEMI/UA while the rest 39% had STEMI. Of all STEMI who were hospitalized only 18% had primary PCI done while another 22% were thrombolysed and 20% taken up for pharmacoinvasive approach. Thus 40% patients of STEMI patients could neither be thrombolysed nor could they be given benefit of PCI. Amongst NSTEMI patients, 58% underwent PCI. Of all ACS patients who were taken up for CART  $\pm$  8% were advised CABG. In-hospital mortality was 11.5% overall.

**Conclusions:** Even today only 60% of hospitalized STEMI patients get benefit of reperfusion therapy with only 18% undergoing primary PCI. In-hospital mortality still remains high to 11.5% due to delayed presentation of MI. Thus, to improve the chain of survival for ACS, a highly integrated strategy is required beginning with patient education about the symptoms of ACS and early contact with the medical system, coordination of destination protocols in emergency medical services (EMS) systems, and efficient practices in emergency departments to shorten door-to-reperfusion time.

### Prevalence and predictors of occult left ventricular diastolic dysfunction in elderly



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**Introduction:** Because the process of myocardial remodelling starts before the onset of symptoms, recent heart failure (HF) guidelines

place special emphasis on the detection of subclinical left ventricular (LV) systolic and diastolic dysfunction and the timely identification of risk factors for HF. Our goal was to describe the prevalence and determinants (risk factors) of LV diastolic dysfunction in asymptomatic elderly population which is expected to have higher prevalence of diastolic dysfunction.

**Methods:** We evaluated 103 asymptomatic elderly populations at random in the LTMG Hospital, Mumbai from January 2015 to June 2015. For this we have included the patient's relatives who were beyond 60 years of age with LV ejection fraction  $\geq 60\%$ . Patients with organic heart disease were excluded from the study. Data on demographics, baseline characteristics, and medical therapies was collected. In a randomly recruited population sample ( $n = 103$ ; 53.3% women; mean age, 67.9 years), we measured early and late diastolic peak velocities of mitral inflow (E and A), pulmonary vein flow by pulsed-wave Doppler, and the mitral annular velocities (Ea and Aa) at 4 sites by tissue Doppler imaging. Stata SE 13.1 was used to analyse data. Fishers Exact test was applied to test the relationship of categorised independent and dependent variables.

**Results:** In the study population of 103, overall prevalence of diastolic dysfunction was 63.10% with the number of subjects in diastolic dysfunction groups 1 (impaired relaxation), 2 (elevated LV end-diastolic filling pressure), and 3 (elevated E/Ea and abnormally low E/A) were 43 (41.74%), 18 (17.47%), and 4 (3.88%), respectively (Table 1). We used Ar-A  $> 30$  ms to confirm possible elevation of LV filling pressures in group 2. Only 38 (36.89%) patients had normal diastolic function. Predictors of diastolic dysfunction in elderly were identified as age  $> 70$  years ( $p = 0.02$ ), type 2 DM ( $p = 0.03$ ), and smoking ( $p = 0.05$ ), though we did not find any significant difference correlating diastolic dysfunction with sex ( $p = 0.09$ ) and hypertension ( $p = 0.1$ ) (Table 2).

**Conclusions:** The overall prevalence of LV diastolic dysfunction in a random sample of an elderly population is as high as 63.10% with advanced age being the best predictor of diastolic dysfunction followed by diabetes mellitus and smoking, though

gender and hypertension failed to predict the presence of diastolic dysfunction.

## Clinical and angiographic characterization of STEMI in women in Eastern India



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**Introduction:** India is now estimated to be the coronary artery disease (CAD) capital of the world. CAD among women as a group is less easily recognized worldwide and this problem is especially relevant in a developing country like India.

**Aims and methods:** Fifty female patients of STEMI, aged less than 65 years (mean 49 years) were assessed by clinical, biochemical, and coronary angiographic study. Main parameters observed were time of presentation and angiographic severity.

**Results:** Average duration of presentation to hospital from symptom onset was 28 h and only 30% ( $n = 15$ ) patients presented within window period of 12 h. Single vessel disease (SVD) was noted in 70% ( $n = 35$ ) patients. Double (DVD) and triple vessel disease (TVD) was seen in 16% ( $n = 8$ ) and 14% ( $n = 7$ ), respectively. Among specific coronary artery disease, LAD was involved in 78% ( $n = 39$ ), LCX 26% ( $n = 13$ ), and RCA 26% ( $n = 13$ ). LMCA was involved in 8% ( $n = 4$ ) cases.

**Conclusion:** This study reiterates the need of establishing systems for early recognition and awareness of CAD among women in India. As SVD is more common, complete revascularization through PCI is feasible and economically viable in this segment of the Indian population.

**Table 1**

Echo parameters (mean)	Normal function N = 38 (36.89%)	Grade I N = 43 (41.74%)	Grade II N = 18 (17.47%)	Grade III N = 4 (3.88%)
LA (mm)	38.8	40.6	42.5	41.4
LV (mm)	50.3	50.7	50.5	48.5
IVS (mm)	9.6	10.4	10.8	12.2
PW (mm)	8.5	9.2	9.6	10.4
EF (%)	68.4	66	71.8	71.6
E peak (cm/s)	78.3	53.8	81.3	63
A peak (cm/s)	60.6	78.9	82.2	96.2
E/A	1.37	0.7	1.02	0.65
IVRT (ms)	98.3	114.9	108.5	107.1
Ea peak	12.7	8.28	7.8	5.94
Aa peak	10.2	12.1	10.5	11.6
E/Ea ratio	6.37	6.66	10.6	10.7

**Table 2**

	Normal diastolic function N = 38	Diastolic dysfunction N = 65	p value
Age (mean)	65	71	0.02
Male (n, %)	14 (36.84)	34 (52.30)	0.09
Smoker	7 (18.42)	29 (44.61)	0.05
Diabetic	15 (39.47)	39 (60)	0.03
Hypertensive	20 (52.63)	37 (56.92)	0.10

## An observational, multi-centric, prospective study to understand the usage pattern of Ticagrelor in Indian patients with acute coronary syndrome



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**Rationale:** The choice of newer anti-platelet therapies and strategies is continuously evolving as well as the International guidelines for their use. The available data concerning the usage pattern of newer anti-platelet therapies in ACS patients is largely derived, essentially from clinical trials. The TREASURE observational study is designed to address the need to understand the usage pattern of Ticagrelor in real life scenario in large number of ACS patients in India.

The multicenter national participation will allow generating real life evidence by involving patients from different geographies and healthcare systems in India.

**Objectives:** To describe the usage pattern of Ticagrelor in various ACS patient population who undergo either PCI, CABG, or medical management in a real-life setting in India. Also to record various risk factors (i.e. elderly patients, diabetes, renal impairment, smoking, risk score, and their association with ACS and usage of Ticagrelor).

**Methods:** This is an observational, multi-centric, prospective study. Study intends to include 3000 subjects from 60 sites across India. Key inclusion criteria would be provision of subject informed