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Clinical profile of the patients with myocardial infarction who underwent angiography at a rural tertiary care hospital

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Abstract
Background: Coronary angiography can be used to definitively diagnose or rule out coronary artery disease.
Aim: The present study was aimed to study the gender-based difference in general characteristics, risk factors, severity and types of MI in patients presenting with MI who underwent coronary angiography.
Methods: A total of 176 patients with MI who underwent coronary angiography between 2015 and 2017 were retrospectively studied. Diagnosis of acute MI was made according to World Health Organization (WHO) guidelines. The patients were grouped according to Killip class based on the physical findings at the time of admission.
Results: Mean age of the patients was 59.72±11.57 years. Male to female ratio was 4.2:1. The most common coronary risk factor was active smoking (56.8%) followed by hypertension (26.7%), and diabetes (21.6%). Approximately 88% of the patients were in Killip class-I followed by 8% in Killip class-II. There were only two patients in Killip class-IV. Approximately half of the patients (49.4%) were diagnosed with ST elevated MI (STEMI), 38.1% with non-STEMI (NSTEMI), and remaining 12.4% with unstable angina. Median age of both male and female was comparable (P=0.489) (Figure 3). None of the coronary risk factors was significantly associated with gender of the patients (P>0.05). Severity of Killip class was significantly higher among females (P=0.002). Females had a significantly higher incidence of unstable angina (P=0.027).
Conclusion: Females have more severe MI. The healthcare professionals should pay more attention to the female health, especially in females with AMI.

Keywords: myocardial infarction, coronary angiography, killip class

Introduction
Cardiovascular diseases (CVDs) have become an important cause of mortality. This epidemiological alteration is mainly due to the increase in the prevalence of CVDs and CVD risk factors [1]. Coronary artery disease (CAD) is of significant human cost and financial burden worldwide. Individuals' lifestyle, hereditary history, and environmental factors are the risk factors in the development of the CVD. [2, 3] CAD develops as a result of plague deposition within coronary arteries that are responsible for blood supply to heart muscles leading to a condition known as atherosclerosis [4]. Atherosclerotic changes result in the narrowing of the coronary arteries and reduced blood flow to the heart. Myocardial infarction (MI) occurs as a result of prolonged myocardial cell ischemia with the involvement of myocardial necrosis that may lead to traumatic events that are life-threatening and uneventful [1].
Medical care and technologies have greatly improved and facilitated access to health care. However, primary prevention strategies of CVDs have not reached the common people [5, 6]. This study was performed to identify the gender-based difference in general characteristics, risk factors, severity and types of MI in patients presenting with MI who underwent coronary angiography.

Methods
A total of 176 patients with MI who underwent coronary angiography between 2015 and 2017 were retrospectively studied.
Diagnosis of acute MI (AMI) was made according to World Health Organization (WHO) guidelines. The patients were included if they had a clinical history of ischemic-type chest discomfort, had changes in electrocardiographic tracings, and there was a change in serum cardiac markers.
Data were recorded from the case record files.
The patients were grouped according to Killip class based on the physical findings at the time of admission. "Class I - Absence of rales over lung fields and absence of third heart sound, Class II - Rales over 50% or less of the lung fields or presence of third heart sound, Class III - Rales over more than 50% of lung fields, and Class IV - Cardiogenic shock).

Statistical analysis
Data were recorded into Microsoft® excel workbook, and exported into SPSS v21.0 (for statistical analysis. Quantitative data were expressed as frequency and percentage, and compared using Chi square test. Quantitative non-normative data were expressed as median [interquartile range], and compared using Mann Whitney U test. P value <0.05 was considered significant.

Results
General characteristics
Mean age of the patients was 59.72±11.57 years. Male to female ratio was 4.2:1. The most common coronary risk factor was active smoking (56.8%) followed by hypertension (26.7%), and diabetes (21.6%).

Killip class
Approximately 88% of the patients were in Killip class-I followed by 8% in Killip class-II. There were only two patients in Killip class-IV (Figure 1).

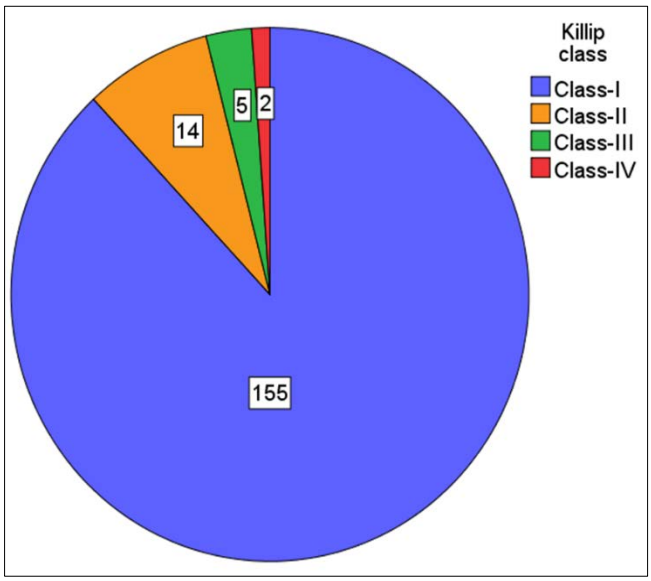

Fig 1: Distribution of patients on the basis of Killip class

Type of MI

Approximately half of the patients (49.4%) were diagnosed with ST elevated MI (STEMI), 38.1% with non-STEMI (NSTEMI), and remaining 12.4% with unstable angina.

Gender-based comparison of general characteristics

Median age of both male and female was comparable (P=0.489) (Figure 3). None of the coronary risk factors was significantly associated with gender of the patients (P>0.05). Severity of Killip class was significantly higher among females (P=0.002). Females had a significantly higher incidence of unstable angina (P=0.027) (Table 2).

Table 1: General characteristics

	Frequency	Percentage
Age (years)		
≤40	8	4.5
>40	168	95.5
Gender		
Male	142	80.7
Female	34	19.3
Coronary risk factors		
Smoking	100	56.8
Diabetes	38	21.6
Hypertension	47	26.7

Table 2: Gender-based comparison of general characteristics

	Male (n=142)	Female (n=34)	P value
Age (years)			
≤40	7 (4.9%)	1 (2.9%)	0.967
>40	135 (95.1%)	33 (97.1%)	
Coronary risk factors			
Smoking	99 (69.7%)	1 (2.9%)	0.11
Diabetes	28 (19.7%)	10 (29.4%)	0.22
Hypertension	35 (24.6%)	12 (35.3%)	0.21
Type of MI			
NSTEMI	50 (35.2%)	17 (50%)	0.027
STEMI	77 (54.2%)	10 (29.4%)	
Unstable angina	15 (10.6%)	7 (20.6%)	
Killip class			
I	130 (91.5%)	25 (73.5%)	0.002
II	10 (7%)	4 (11.8%)	
III	1 (0.7%)	4 (11.8%)	
IV	1 (0.7%)	1 (2.9%)	

Discussion

Epidemiological studies have revealed that the prevalence of CAD is increasing along with the rising prevalence of conventional risk factors for CAD in India. Indians have one of the highest rates of heart disease in the world.

The disease also tends to be more aggressive and manifests at a younger age. However, in our study, the mean age of presentation was 59.72±11.57 years comparable to other studies done in India, that is, Sharma et al. [7] study (54.70 ± 19.90 years), the Western population as in COURAGE trial 62 ± 5 years conducted in USA, but lower than study by Hochman *et al*. [8] (69 years), and Chang et al. (73 years). [9]

The skewed gender distribution males 79.5% versus females 20.5% of the study population can be attributed to the gender bias and atypical presentation, which is also a feature in Interheart study and its South Asian cohort (overall male, 76% and South Asian cohort, 85%). [10]

In our study, median age of both males and females was comparable (P=0.967). However, in a study by Moshki et al. [11], males were significantly younger than females (P=0.04). One of the reasons could be a lesser number of females in our study.

In our study, females had a non-significantly higher co-morbidities such as diabetes and hypertension. A study conducted in Tehran also reported that diabetes mellitus, hyperlipidemia and hypertension were more common in females with AMI than in men [12].

The study limitations include the noninclusion of factors like detailed dietary habits, exercise frequency and alcohol consumption, as the primary aim was to study the clinical correlation with angiographic profile of the first event of ACS patients. The waist hip ratio, which is better marker for measurement of obesity, was not used in our study. In mortality group, only five patients could undergo angiogram because of unstable condition, which restricted us in commenting on how CAD severity influenced the mortality group.

Conclusion

There is a higher prevalence of diabetes and hypertension in Indian subcontinent. The prevalence of some important risk factors (such as diabetes and hypertension) seems to be higher in females than in males. Moreover, females have more severe MI. Therefore, the healthcare team, including nurses and physicians, should pay more attention to the female health, especially in females with AMI. Community interventions should also be implemented to reduce the risk factors of CAD and AMI with special focus on female health.

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