

Assessment of Different Risk Components in 150 subjects suffering from Acute Coronary Syndrome (ACS) at A Tertiary Care Hospital.

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Abstract

Background: The rates of predictable risk issues responsible for acute coronary syndrome are different in male and female gender, equally in the common populace and in subjects suffering from ACS (acute coronary syndrome). **Objective:** To analyze the incidence of conservative risk issues in patients suffering from acute coronary syndrome in both genders (males and females) in Pakistani population. **Design:** This was a cross-sectional study. **Setting:** Cardiology Department, PMC Hospital Nawabshah **Sample size:** A total of 150 male and female patients with acute coronary syndrome. **Duration:** 1stAugust, 2019 and February 2020. **Material and Methods:** Subsequent to thorough history and examination; routine necessary investigations were advised for assessment of the different risk factors in relation to ACS. Hypertension, diabetes mellitus and other cardiac risk factors were enquired from all the participating subjects. History concerned to smoking and the presence of the ischemic heart disease in first degree relatives were also obtained. From the records of subjects Lipid profile facts were also noted.

Results: From the four conventional risk factors at a minimum one risk factor was analyzed in –150 subjects. More women were noted with hypertensive and diabetes ($p = 0.003$ and 0.009 respectively) in comparison to the males. 34.00% of males ($P = <0.001$) were smokers and 00% of females with smoking were noted. **Conclusion:** In women frequency of diabetes mellitus and hyper-tension was more than males. There was increased incident of smoking in males with acute coronary syndrome in comparison to females. To understand the gender difference in better way more researches are required on several aspects of ischemic heart disease that occur in our inhabitants.

Key Words: Acute Coronary Syndrome, ACS, STEMI, NSTEMI, Unstable Angina.

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INTRODUCTION:

A rupture of an atherosclerotic plaque in the coronary artery resulting in partial or complete thrombosis leads to a variety of clinical presentations referred as acute coronary syndromes (ACS).¹ Unstable angina (UA), Non–ST-segment Elevation Myocardial Infarction (NSTEMI), and ST-segment Elevation Myocardial Infarction (STEMI) are the inclusions of this syndrome. In spite of the parallel pathophysiology of UA and NSTEMI, the irvariation is established on the cruelty of symptoms and the existence of definite bio-

markers. Myocardial infarction (MI) is usually presented with severe chest pain. Furthermore, after myocardial necrosis biomarkers are released after some hours of the onset of pain in chest in NSTEMI but not after Unstable Angina. Cardiac-specific troponins T or I and CK-MB (muscle and brain fraction of creatinine kinase) are the biomarkers associated with myocardial necrosis². Coronary Artery Disease (CAD) is usually manifested at younger age in obese subjects³. Hypercholesterolemia, hypertension, diabetes mellitus (DM),

smoking and obesity are the common risk factors for CAD^{2,3}.

Around 01.36 million subjects are hospitalized each year in USA due to ACS². The incidence of ACS is different from country to country in the Middle East. In 2004, ACS in Saudi Arabia was 06.00%, in Egypt (2001) 08.3% and in Lebanon (2008) 13.00%⁴. The frequency of ACS is estimated to increase by 2030; due to growing incidence of HTN, DM, overweight, obesity, physical inactivity, smoking and dyslipidemia⁴. The substantial cause of morbidity and mortality around the globe remains due to the premature ACS. The reason of death in younger Canadians subjects (1894 in 2012) with age less than 55 years was CAD. A substantial source of vanished work productivity, joblessness, and ill health in younger age class (under the age of 40; 85% of them male) were related with ACS⁵. In Iraq, 29.20% of the subjects with CAD were under the age of 50 years and from them 58.50% were male⁶. However the occurrence of coronary events are increased amongst the male gender, but the death rate from CAD is higher in female gender⁷.

Aim of Study

To conclude the risk issues in subjects presenting with ACS at CCU PMCH Nawabshah.

Rationale

By identifying the risk factors in patients with ACS, it will be properly managed by the health care providers. Awareness particular for patients and public on whole can be imposed in decreasing the morbidity and mortality by the current research.

Operational Definition

ACS: A rupture of an atherosclerotic plaque in the coronary artery resulting in partial or complete thrombosis leads to a variety of clinical presentations referred as acute coronary syndromes (ACS).¹ Unstable angina (UA), Non-ST-segment Elevation Myocardial Infarction (NSTEMI), and ST-segment Elevation Myocardial Infarction (STEMI) are the inclusions of this syndrome.

Methods

Design and Participants Design:

This was a cross sectional study, piloted in the Cardiology Department, PMC Hospital Nawabshah, and all the patients diagnosed as ACS including male and female from the age from 30 years and above were included in this research. The study was performed from 1st August, 2019 and February 2020.

Sample size: A total of 150 male and female patients with acute coronary syndrome.

Data Collection: Specific preformat was considered for the assembly of data. Subsequent to thorough history and examination; routine necessary investigations were advised for assessment of the different risk factors in relation to ACS. Hypertension, diabetes mellitus and other cardiac risk factors were enquired from all the participating subjects. History concerned to smoking and the presence of the ischemic heart disease in first degree relatives were also obtained. From the records of subjects Lipid profile facts were also noted. Venous bloods were obtained and instantaneously send to the laboratory. Subjects with age ranging from 30 to 65 years with ACS were recruited in the study. Exclusion standards comprised; age below 30 and above 70 years, and subjects denying joining in the study.

Ethical Considerations

Subsequent to the authorization from ethical review committee we preceded this study.

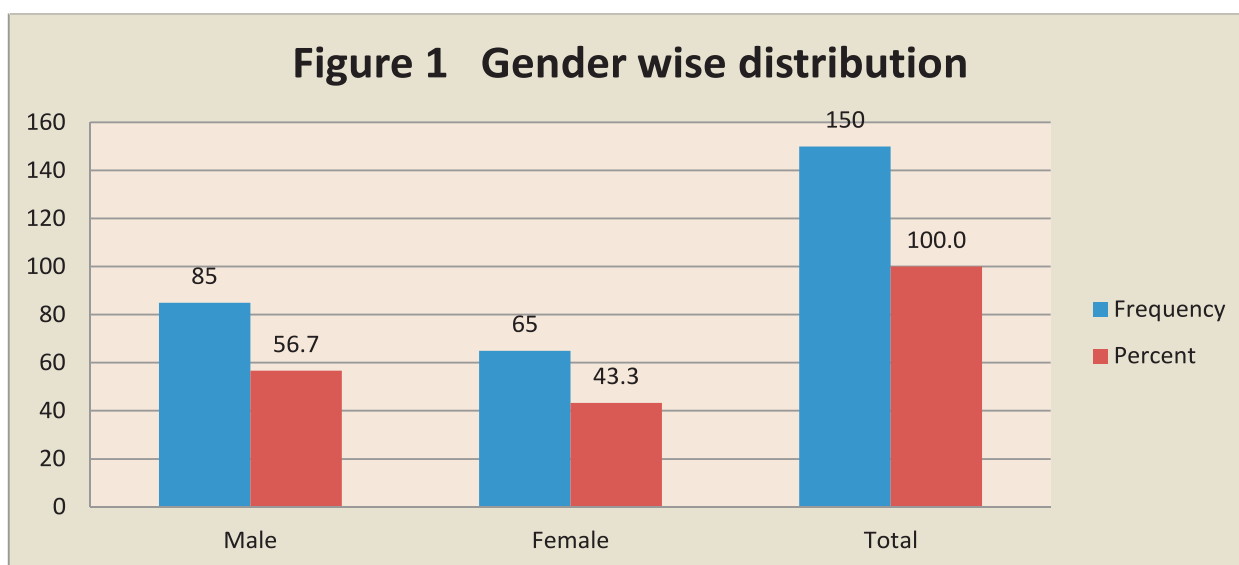
Statistical Analysis

A computer software program SPSS version 20.0 was applied for analyses of the collected data. The assessment of percentages and frequencies for dissimilar variables such as; DM, HTN, Smoking and obesity in patients with diverse ACS levels were obtained. The assessment for mean and SD for categorical variables such as; age, gender, and others in patients with diverse ACS levels were obtained. Stratification was performed for to observe the effect modifiers such as age and sex. Chi-square test was performed for all the variables.

Results:

There were 150 patients included in this study, the mean age of patients was 55.76 years with SD12.47, minimum and maximum ages were 24.00 &90.00 respectively. Table 1

Table 1 Descriptive Statistics							
	N	Range	Minimum	Maximum	Meanage	Std. Deviation	Variance
age in years	150	66.00	24.00	90.00	55.76	12.47316	155.580



There were 85(56.7%) males and 65(43.3%) females. Figure 1

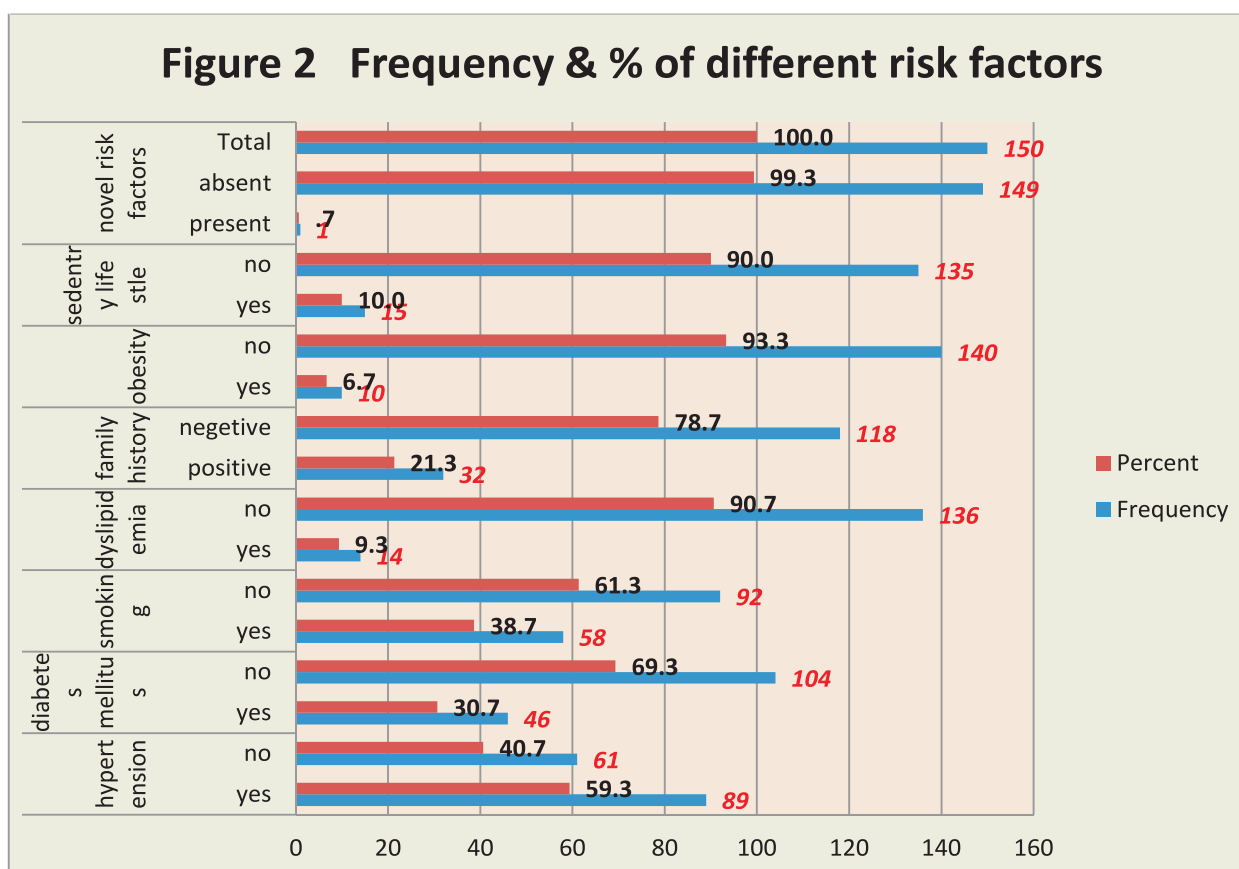


Table 2 Cross tabulation						
variable	response	%	Gender		Total	Pearson Chi-Square
			Male	Female		Asymp. Sig. (2-sided)
Hypertension	Yes	Count	53	36	89	.389
		% of Total	35.30%	24.00%	59.30%	
	No	Count	32	29	61	
		% of Total	21.30%	19.30%	40.70%	
Diabetes Mellitus	Yes	Count	24	22	46	.460
		% of Total	16.00%	14.70%	30.70%	
	No	Count	61	43	104	
		% of Total	40.70%	28.70%	69.30%	
Smoking	Yes	Count	44	14	58	.000
		% of Total	29.30%	9.30%	38.70%	
	No	Count	41	51	92	
		% of Total	27.30%	34.00%	61.30%	
Dyslipideamia	Yes	Count	10	4	14	.242
		% of Total	6.70%	2.70%	9.30%	
	No	Count	75	61	136	
		% of Total	50.00%	40.70%	90.70%	
Family History	Positive	Count	22	10	32	.120
		% of Total	14.70%	6.70%	21.30%	
	Negative	Count	63	55	118	
		% of Total	42.00%	36.70%	78.70%	
Obesity	Yes	Count	5	5	10	.660
		% of Total	3.30%	3.30%	6.70%	
	No	Count	80	60	140	
		% of Total	53.30%	40.00%	93.30%	
Sedentary Life Style	Yes	Count	13	2	15	.013
		% of Total	8.70%	1.30%	10.00%	
	No	Count	72	63	135	
		% of Total	48.00%	42.00%	90.00%	
Novel Risk Factors	Present	Count	1	0	1	.380
		% of Total	0.70%	0.00%	0.70%	
	Absent	Count	84	65	149	
		% of Total	56.00%	43.30%	99.30%	
Total	Count	85	65	150		
	% of Total	56.70%	43.30%	100.00%		

Table 3 Paired Samples Statistics&Paired Samples Correlations					
variables	Mean	Std. Deviation	Std. Error Mean	Correlation	Sig.
Gender Hypertension	1.4333	.49720	.04060	.070	.393
	1.4067	.49286	.04024		
Gender Diabetes Mellitus	1.4333	.49720	.04060	-.060	.464
	1.6933	.46265	.03778		
Gender Smoking	1.4333	.49720	.04060	.308	.000
	1.6133	.48862	.03990		
Gender Dyslipideamia	1.4333	.49720	.04060	.096	.245
	1.9067	.29187	.02383		
Gender Family History	1.4333	.49720	.04060	.127	.122
	1.7867	.41103	.03356		
Gender Obesity	1.4333	.49720	.04060	-.036	.662
	1.9333	.25028	.02044		
Gender Sedentary Life Style	1.4333	.49720	.04060	.202	.013
	1.9000	.30101	.02458		
Gender Novel Risk Factors	1.4333	.49720	.04060	.072	.384
	1.9933	.08165	.00667		

Table 4 Paired Samples Test								
variable	Paired Differences					t	df	Sig. (2-tailed)
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error	Lower	Upper			
Gender Hypertension	-.02667	.67503	.05512	-.08224	.13558	.484	149	.629
Gender - Diabetes Mellitus	-.26000	.69928	.05710	-.37282	-.14718	-4.554	149	.000
Gender - Smoking	-.18000	.58009	.04736	-.27359	-.08641	-3.800	149	.000
Gender Dyslipidemia	-.47333	.55195	.04507	-.56239	-.38428	-10.503	149	.000
Gender - Family History	-.35333	.60353	.04928	-.45071	-.25596	-7.170	149	.000
Gender - Obesity	-.50000	.56462	.04610	-.59110	-.40890	-10.846	149	.000
Gender - Sedentry Life Stle	-.46667	.52669	.04300	-.55164	-.38169	-10.852	149	.000
Gender - Novel Risk Factors	-.56000	.49805	.04067	-.64036	-.47964	-13.771	149	.000

Discussion

A rupture of an atherosclerotic plaque in the coronary artery resulting in partial or complete thrombosis leads to acute coronary syndromes (ACS) and comprises the unstable angina (UA), Non-ST-segment Elevation Myocardial Infarction (NSTEMI), and ST-segment Elevation Myocardial Infarction (STEMI). The prime manifestation resulting due to ACS is the IHD (ischemic heart disease). IHD is the major portion of the ailments of the cardiovascular diseases⁸. The leading cause of mortality in women is the cardiovascular diseases and these are under-estimated in the females⁹. Every year death due to cardiovascular diseases in female subjects is higher than the male subjects. In 2004, 32.00% of female death was related to cardiovascular diseases in comparison to 27.00% in the males. Conversely in both genders the IHD remains the common reason of expiry globally¹⁰. The IHD is responsible for about 11.00% of total deaths and is the 2nd leading cause of death in Pakistan¹¹. The chief or the conventional risk issues for IHD include HTN, DM, dyslipidemias and smoking. The large number of subjects with IHD has one or more from these risk factors for that reasons these factors are called as the conventional¹². More than 80.00% of MI (myocardial infarction) in the common public is related with these conventional factors and as well as to the physical inactivity¹³. In a study by

Mirza AJ et al, the mean age of the study subjects was 36.00 years and the male population was 85.00%. The BMI was 29 kg/m² and the waist circumference was 98.00cms. The BMI and the waist circumferences were higher than the controls (BMI 24.00 kg/m² and 72.00cms waist circumference) respectively. Obesity was prevalent in 86.00 subjects, smoking in 62, HTN in 26 DM in 22 and significant family history was noted in 24 patients with ACS. Multi-vessel CAD (involving 2 – 3 vessels) was analysed in 83 subjects. ACS is rising health issue in young adults with obesity as the most prevalent risk issue¹⁴. Another well-known factor for DM as an absolute risk issue was the DM¹⁵. The incidence and consequence of risk issues fluctuate by the form of ACS. STEMI is usually associated in subjects with alcohol abuse and smoking. Subjects with high rate of hypertension, previous ACS or angina (stable) mostly manifest with NSTEMI or unstable angina. Dyslipidemias were more common in subjects with NSTEMI than in subjects with STEMI or UA. Subjects with diabetes mellitus don't show any dominance to any kind of ACS¹⁶. The younger age groups with mean age of 53.00 years from south Asian population have higher rates of Myocardial infarction in comparison to other nations with mean age of 58.8 years. Higher apolipoprotein B₁₀₀ /apolipoprotein A-I ratio and higher waist to hip ratio and other risk factors are more common in south

Asian population below the age of 60 years¹⁷. South Asians suffer one decade earlier in comparison with western nations¹⁸. However in Sri Lanka the average age of ACS presentation ranges from 61 to 63.7 years¹⁹. So the onset of ACS is later in life in Sri Lankan populations as compared to the South Asians. To elucidate this dissimilarity in the region studies are required on large scale. An increased one year mortality rate was associated with STEMI in subjects with DM, on the other hand the one year mortality rate was similar for non-diabetics with STEMI to that of subjects with diabetes mellitus with NSTEMI or Un-stable Angina²⁰. Smoking and alcohol abuse are the modifiable risk issues that can lead to the STEMI. By proper education and the life style adjustments the risk of STEMI may be restricted or abolished to a greater extent.

Conclusions:

A rising public health issue at younger age is the ACS. Obesity is the well-known factor for the development of atherosclerosis. Obesity the recognized risk agent was the most prevalent in current series. A prompt and correct identification of ACS and its risk issues is essential to direct management consequently.

Recommendations: To recognize the epidemiology, clinical features and risk factors for the ACS especially at different regional levels more researches are required. The knowledge will help in implementing the precautionary actions such as lifestyle alterations and medical treatment improving risk factors.

Limitations:

This is small single centre study representing only small part of population.

Conflict of interests

None to be professed.

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No any fund was delivered.

Authors contribution

Dr Ghulam Fareed Shah, Dr Qurban Ali Rahu Dr. Jagdesh Kumar Khatri designed the research and gathered the statistics.

Dr Muhammad Khan Soomro analyzed the figures, reviews the literature and composed

the text. Dr. Anwar Ali Jamali participates in analyzing data.

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Footnotes

Peer review under responsibility of JPUMHS Nawabshah.

References

1. Mansour H., Reda A., Mena M., Ghaleb R., Elkersh A. Pattern of risk factors and management strategies in patients with acute coronary syndrome, in different age groups and sex categories. *Atherosclerosis Supp.* **2017**;25:e1–e11. [Google Scholar]
2. Kumar A., Cannon C.P. Acute coronary syndromes: diagnosis and management. Part I. *Mayo Clin Proc.* **2009**;84:917–938. [PMC free article] [PubMed] [Google Scholar]
3. Foussas S. Obesity and acute coronary syndromes. *Hellenic J Cardiol.* **2016**;57:63–65. [PubMed] [Google Scholar]
4. Ahmed M.H., Awadalla H., Elmadhoun W.M., Osman M., Noor S.K., Almobarak A.O. Prevalence and risk factors for acute coronary syndrome among sudanese individuals with diabetes: a population-based study. *Cardiol Res.* **2017**;8:184–189. [PMC free article] [PubMed] [Google Scholar]
5. Sedlak T.L., Izadnegahdar M. Outcomes in premature acute coronary syndrome: has the sex gap closed? [Editorial] *Can J Cardiol.* **2016**;32:1375–1377. [PubMed] [Google Scholar]
6. Al-Mukhtar S.B., Ahmad A.J. Comparison between quantitative and qualitative biochemical markers in the diagnosis of acute coronary syndrome. *Iraq J Pharm.* **2011**;11:101–109. [Google Scholar]
7. Al-Marayati A.N., Al-Mosawi N. In-hospital outcome and complications of percutaneous coronary intervention in acute coronary syndrome, gender differences. *Fac Med Baghdad.* **2008**;50:420–4243. [Google Scholar]
8. Braunwald E, Fauci AS, Kasper DL, et al.: *Harrison's Principles of Internal Medicine.* 15 ed. New York, Mc-Graw-Hill, **2001**: pp 1386-8.

9. Stramba-Badiale M, Fox KM, Priori SG, et al.: Cardio-vascular diseases in women: a statement from the poli-cy conference of the European Society of Cardiology. *Eur Heart J* **2006** Apr;27(8):994-1005.
10. Gao YT, Shu XO, Dai Q, et al.: Association of men-strual and reproductive factors with breast cancer risk: results from the Shanghai Breast Cancer Study. *Int J Cancer* **2000** Jul 15;87(2):295-300.
11. Andrieu N, Prevost T, Rohan TE, et al.: Variation in the interaction between familial and reproductive factors on the risk of breast cancer according to age, menopausal status, and degree of familiarity. *Int J Epidemiol* **2000** Apr;29(2):214-23
12. Khot UN, Khot MB, Bajzer CT, et al.: Prevalence of conventional risk factors in patients with coronary heart disease. *JAMA* **2003** Aug 20;290(7):898-904.
13. Heidemann C, Hoffmann K, Klipstein-Grobusch K, et al.: Potentially modifiable classic risk factors and their impact on incident myocardial infarction: results from the EPIC-Potsdam study. *Eur J Cardiovasc Prev Reha-bil* 2007 Feb;14(1):65-71
14. Aram J. Mirza,^a Abdulsalam Y. Taha,^{b,□} and Bahar R. Khdir^c. Risk factors for acute coronary syndrome in patients below the age of 40 years. *Egypt Heart J.* 2018 Dec; 70(4): 233–235. Published online **2018** Jun 2. doi: 10.1016/j.ehj.2018.05.005
15. Sakhi H., Hassoon S.M. Admission plasma glucose level among non-diabetic patients sustaining acute coronary syndrome. *Mustansiriya Med J.* **2011**;10:1–7. [Google Scholar]
16. Ralapanawa U, Kumarasiri PV, Jayawickreme KP, Kumarihamy P, Wijeratne Y, Ekanayake M, Dissanayake C. Epidemiology and risk factors of patients with types of acute coronary syndrome presenting to a tertiary care hospital in Sri Lanka. *BMC Cardiovascular Disorders* volume 19, Article number: 229 (**2019**) <https://doi.org/10.1186/s12872-019-1217-x>
17. Joshi P, Islam S, Pais P, Reddy S, Dorairaj P, Kazmi K, Pandey MR, Haque S, Mendis S, Rangarajan S, Yusuf S. Risk factors for early myocardial infarction in south Asians compared with individuals in other countries. *JAMA.* **2007**;297(3):286–94. <https://doi.org/10.1001/jama.297.3.286>.
18. Sharma R, Bhairappa PSR, Manjunath CN. Clinical characteristics, angiographic profile and in hospital mortality in acute coronary syndrome patients in south indian population. *Heart India.* **2014**;2(3):65–9.
19. Medagama A, Bandara R, De Silva C, Galgomuwa MP. Management of acute coronary syndromes in a developing country; time for a paradigm shift? an observational study. *BMC CardiovascDisord.* **2015**;15:133. <https://doi.org/10.1186/s12872-015-0125-y>.
20. Donahoe SM, Stewart GC, CH MC, et al. Diabetes and mortality following acute coronary syndromes. *JAMA.* **2007**;298:765–75.