Original Article

Presentation, Management Practices and In-hospital Outcomes of Patients with Acute Coronary Syndrome in a Tertiary Cardiac Centre in Bangladesh

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Abstract

Background: There is no large-scale data on the management practices and in-hospital outcomes of acute coronary syndromes (ACS) in Bangladesh. This study aimed to document the presentation characteristics, treatment practices and in-hospital outcomes of ACS patients presenting to a specialized tertiary cardiac care institute in Bangladesh.

Methods: This retrospective observational study included all ACS patients presenting to Ibrahim Cardiac Hospital & Research Institute (ICHRI), Dhaka, Bangladesh, over the period of January 2013 to December 2013. Data were collected from hospital discharge records and catheterization laboratory database, and analysis was carried out using Statistical Package for Social Sciences (SPSS) version 16.0 (Chicago, Illinois, USA).

Result: A total of 1914 ACS patients were included. The mean age was 57.8 ± 12.1 years. 71.4% were male. 39.8% presented with ST-elevation myocardial infarction (STEMI), 39.7% with non- ST-elevation myocardial infarction (NSTEMI) and 20.5% presented with unstable angina (UA). 68.91% were diabetic, 74.24% hypertensive, 53.23% were dyslipidaemic, 25.75% were smokers and 20.72% had chronic kidney disease (CKD).1022 (53.4%) of all admitted ACS patients underwent coronary angiography, among whom 649 (33.9%) were advised percutaneous coronary intervention (PCI), and 198 (10.3%) and 207 (10.8%) were advised coronary artery bypass graft (CABG) surgery and medical management respectively. PCI was performed in 509 patients (26.6%)during the index admission. The majority of these patients were those of STEMI (39.23%), among whom 47 (6.2%) underwent primary PCI. 146 (7.6%) of the patients presenting with ACS expired during hospital stay. Mortality was highest among STEMI (10.5%), followed by NSTEMI (8.3%) and UA (1%). 501 (26.2%) patients developed left ventricular failure, 108 (5.6%) patients developed shock and 265 (13.8%) developed acute kidney injury.

Conclusion: This study represents one of the larger single-centre analyses of ACS patients in Bangladesh thus far. Our patients have high prevalence of cardiovascular risk factors, particularly diabetes and hypertension. There is room for further improvement in terms of guideline-directed medical and interventional treatment modalities, in order to improve outcomes.

Key words: Acute coronary syndrome, Outcomes, Bangladesh.

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Introduction

Cardiovascular disease (CVD) is a growing epidemic in South Asia, and is the leading cause of mortality in the Indian subcontinent[1], as well as Bangladesh[2].Acute coronary syndromes (ACS) are responsible for a large number of emergency hospital admissions and mortality, and represent the principal form of clinical presentation of coronary artery disease (CAD). Estimates from the Global Burden of Disease Study suggest that the South Asian region will have more

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individuals with atherothrombotic cardiovascular disease than any other region by the year 2020[1]. Most notable features of CAD in South Asian populations are extreme prematurity, increased severity, hospitalization and mortality[2,3].

The current understanding of the aetiology of ACS involves plaque erosion or rupture in response to inflammation, leading to local occlusive or non-occlusive thrombus[4]. Depending on the degree and reversibility of this dynamic obstruction, the clinical manifestations of ACS comprise a continuous spectrum of risk that progresses from unstable angina (UA) to non-ST-segment elevation myocardial infarction (NSTEMI) and ST-segment elevation myocardial infarction (STEMI)[5].

A number of national and multi-national registries across the globe, including in Asia, have investigated the clinical characteristics and treatment-related outcomesamong ACS patients[6-26]. These data have shown regional variation in the clinical presentations, use of invasive procedures and outcomes across the spectrum of ACS, across different regions of the world.In the South Asian region, two large registries in India[7-8] have documented the demographic characteristics, treatment practices and outcomes of ACS patients.

There are limited data onthe presentation and outcomes of ACS from Bangladesh, with most of the studies being small ones, restricted to a particular subset of ACS patients[27-29].A large-scale ACS registry of Bangladeshi patients is a timely necessity. This study aimed to document the characteristics, treatment practices and outcomes of ACS patients presenting to a tertiary cardiac care institute in Bangladesh.

Methods

Patient population and definitions: This was a cross-sectional retrospective analysis of all patients who presented with the diagnosis of ACS to Ibrahim Cardiac Hospital & Research Institute (ICHRI), Dhaka, Bangladesh. All consecutive patients with a final diagnosis of ACS comprising of either STEMI, NSTEMI and UA were included in the study. Diagnosis of the different types of ACS and definitions of data variables and outcomes were based on ACCF/ AHA data standards[30].

Data collection: Demographic characteristics, risk factors, baseline clinical parameters, treatment modalities and medication administered, angiographic profiles, revascularization techniques and in-hospital outcomes were documented on a case report form (CRF) by study investigators. Data were derived from hospital in-patient clinical notes, discharge summaries and cardiac catheterization laboratory database.

Statistical analysis: Data analyses were carried out using Statistical Package for Social Sciences(SPSS) version 16.0 (Chicago, Illinois, USA). Continuous variables were expressed as mean ± standard deviation, and compared using the Student's t-test and ANOVA statistics. Categorical variables were expressed as number with corresponding percentage, and compared using the chi-square test.A p value < 0.05 was considered statistically significant.

Ethical approval: The study complied with the Declaration of Helsinki and ethical approval was obtained by the ethical review committee of ICHRI, Dhaka, Bangladesh.

Results

Demographic characteristics, key risk factors, and clinical presentation

A total 5502 patients were admitted during the period from January 2013 to December 2013, of whom 1914 (34.8%) presented withACS.The demographic details and baseline patient characteristics are presented in Table 1. The mean age of participants was 57.8 ± 12.1 (range 21-97) years. The majority of the patients (51.7%) were between the ages of 45- 64 years, with 17.1% <45 years of age. 1366 patients(71.4%) were male. Almost equal numbers of patients presented with STEMI and NSTEMI (39.8% and 39.7% respectively). 392 (20.5%) patients presented with UA. Diabetes (68.91%), hypertension (74.24%) and dyslipidaemia (53.23%) were the leading risk factors for CAD. Smoking and stroke were more common among patients with STEMI ($p<0.001$). Diabetes, prior myocardial infarction (MI) and chronic kidney disease (CKD)were significantly more frequent among those presenting with NSTEMI, while prior percutaneous coronary intervention (PCI), prior coronary artery bypass graft (CABG) surgery and hypertension were more common among those presenting with UA ($p<0.001$). 79.5% of patients had positive cardiac biomarkers at presentation. 79.1% of patients presented with chest pain, a symptom which was approximately equally observed across the whole spectrum of ACS, albeit slightly lesser among those with NSTEMI (42.3%). However, NSTEMIpatients tended to present the most frequently with dyspnoea (42.3%) in comparison with STEMI (24.5%) and UA patients (28.3%). This was reflected further by the increased incidence of left ventricular failure (31.9%) seen among NSTEMI patients.

In-hospital diagnostic evaluations and management

1022 (53.4%) of the 1914 admitted ACS patients underwent coronary angiography during index hospitalisation.Left main stenosis >50% and severe graft vessel stenosis was observed significantly more among NSTEMI patients (3.4% and 1.3% respectively, $p<0.001$). Significant stenosis of left anterior descending (LAD) and right coronary artery (RCA) were seen most frequently among STEMI patients (Table 2).

Table-I

Patient level characteristics in presentation, by ACS type

Parameter	TotalN (%)	STEMIn (%)	NSTEMIn (%)	UAn (%)	p value
Total ACS patients	1914	762 (39.8)	760 (39.7)	392 (20.5)	
Demographics					
Age, years	57.8±12.1	55.6 ± 11.8	60.2 ± 12.2	57.9 ± 11.6	<0.001
<45	327 (17.1)	172(22.5)	97(12.8)	58(21.2)	<0.001
45-64	989 (51.7)	401(52.6)	378(49.8)	210(53.6)	
65-74	382 (20)	125(16.4)	174(22.9)	83(21.2)	
e”75	216 (11.3)	65(8.5)	110(14.5)	41(10.5)	
Sex: male gender	1366 (71.4)	587(77.1)	525(69.0)	254(64.8)	<0.001
BMI	25.6 ± 3.7	25.4 ± 3.6	25.6 ± 3.8	26.2 ± 3.9	0.033
Admitted on holidays	123 (6.4%)	48(6.3)	46(6.0)	29(7.4)	0.664
Key Risk factors					
Diabetes	1319 (68.91)	495(65.0)	556(73.3)	267(68.1)	0.003
Hypertension	1421 (74.24)	518(68.1)	590(77.5)	313(79.8)	<0.001
Tobacco/ Smoking	493 (25.75)	256(33.6)	166(21.8)	71(18.1)	<0.001
Dyslipidaemia	1019 (53.23)	402(52.8)	391(51.4)	226(57.7)	0.124
Prior stroke	107 (5.6)	69(9.1)	37(4.9)	1(0.3)	<0.001
Peripheral vascular disease	48 (2.50)	23(3.0)	15(2.0)	10(2.6)	0.422
Chronic kidney disease	397 (20.74)	104(13.6)	229(30.2)	64(16.3)	<0.001
Previous medical history					
Prior MI	310(16.2)	80(10.5)	160(21.0)	70(17.9)	<0.001
Prior PCI	219 (11.4)	37(4.8)	107(14.1)	75(19.1)	<0.001
Prior CABG	120 (6.3)	19(2.5)	63(8.3)	38(9.7)	<0.001
Clinical features on presentation					
Admitted with chest pain	1514 (79.1%)	635(83.4)	565(74.2)	314(80.1)	<0.001
Admitted with dyspnoea	619 (32.3%)	186(24.4)	322(42.3)	111(28.3)	<0.001
HR <60bpm	165 (8.6%)	78(10.2)	61(8.0)	26(6.6)	0.087
BP <90bpm	83 (4.3%)	50(6.6)	31(4.1)	2(0.5)	<0.001
Key in-hospital investigations					
HbA1C (%)	12.7 ± 1.7	16.6 ± 3.7	9.7 ± 1.5	11.3 ± 3.4	0.182
S. creatinine (mg/dL)	1.4 ± 0.9	1.4 ± 0.9	1.6 ± 1.1	1.3 ± 0.9	<0.001
Cardiac marker positive	1521 (79.5)	761(100.0)	760(99.9)	0(0.0)	<0.001
LDL- cholesterol level (mg/dL)	98.97 ± 41.35	106.6 ± 41.9	95.2 ± 42.0	90.2 ± 35.7	<0.001
LV ejection fraction (%)	49.48± 10.92	47.1 ± 9.6	49.1 ± 11.3	55.2 ± 10.5	<0.001

Table-II

Coronary angiographic findings, by ACS type

Key	n (%)	STEMI	NSTEMI	UA	p value
Left main stenosis >50%	46 (2.3)	13 (1.7)	26 (3.4)	5 (1.3)	0.026
LAD >70%	644 (33.7)	314 (41.3)	261 (34.3)	69 (17.6)	<0.001
LCx>70%	519 (27.1)	211 (27.7)	236 (31.1)	72 (18.4)	<0.001
RCA>70%	520 (27.2)	241 (31.7)	214 (28.2)	65 (16.6)	<0.001
Ramus intermedius>70%	41 (2.1)	12 (1.6)	18 (2.4)	11 (2.8)	0.194
Graft vessel lesion >70%	16 (0.8)	1 (1)	10 (1.3)	5 (1.3)	<0.001

Overall, 649 (33.9%) patients were advised PCI, and 198 (10.3%) and 207 (10.8%) were advised CABG and medical management respectively. PCI was performed in 505patients (26.4%), the majority of whom presented with STEMI (Table3). 448 (88.7%) of those who underwent PCI received a drug eluting stent (DES).Only 47 (6.2%) of STEMI patients underwent primary PCI, 84.1% of whom received a DES.

In-hospital outcomes and predictors of mortality:

146 (7.6%) of the patients presenting with ACS expired during hospital stay (Table 4) with mortality being highest among those presenting with STEMI (10.5%), followed by NSTEMI (8.3%) andUA (1%). 501 (26.2%) patients developed LVF, significantly among NSTEMI patients (21.2%), and 108 (5.6%) of patients developed shock, significantly among STEMI patients. 265 (13.8%) of patients developed acute kidney injury (AKI). The highest incidence of CKD was observed among NSTEMIpatients (30.2%), who were also the most prone to develop AKI (16.6%).142 (7.4%) of patients (most frequently STEMI patients) required mechanical ventilation, of whom 38 were successfully extubated. Multivariate analysis revealed that age >50 years, CKD, bradycardia on admission, shock, LVF, admission with dyspnoea and STEMI were independent predictors of in-hospital mortality (Table 5)

Discharge medical therapy and prescriptions:

95.5% of ACS patients received aspirin at discharge, 93.2% in whom it was prescribed as a component of dual antiplatelet therapy (DAPT) (Table 6). Statins (82.8%) and

Table-III

In-hospital diagnostic evaluations and treatment modalities, by acute coronary syndrome type

Key	n (%)	STEMI	NSTEMI	UA	p value
Coronary angiography	1022 (53.4%)	479 (62.9)	385 (50.7)	158 (40.3)	<0.001
Advised PCI	649 (33.9)	348(45.7)	230(30.3)	71(18.1)	<0.001
PCI on same admission	505(26.4)	297 (39.0)	163(21.4)	45 (11.5)	<0.001
Among PCI, received drug eluting stent	448(23.4)	261(34.3)	148 (19.4)	39 (9.9)	<0.001
Received BMS	108 (5.6)	64 (8.4)	36 (4.7)	8 (2)	<0.001
Primary PCI done	47 (6.2)	47 (6.2)	-	-	-
Advised CABG	198 (10.4)	72(9.5)	90(11.8)	36(9.2)	0.218
CABG done same admission	7(0.4)	1(0.1)	5(0.7)	1(0.1)	0.214
Advisedmedical management	206(11.7)	56(8.2)	83(11.9)	67(17.3)	<0.001

Table-IV

In-hospital event rates, by acute coronary syndrome type

In-hospital event rates		STEMI	NSTEMI	UA	P value
Shock	107 (5.6)	69(9.1)	37(4.9)	1(0.3)	<0.001
Left ventricular failure	501(26.2)	209(27.5)	243(31.9)	49(12.5)	<0.001
Acute kidney injury	265 (13.8)	113(14.8)	126(16.6)	26(6.6)	<0.001
Required mechanical ventilation	142 (7.4)	71(9.3)	65(8.5)	6(1.5)	<0.001
Expired	146(7.6%)	79(10.4)	63(8.3)	4(1.0)	<0.001

Table-V

Predictors of in-hospital mortality among ACS patients: Multivariate analysis

Variable of interest	Odds Ratio (95% CI of OR)	p-value
Age (≥50 yrs)	2.54(1.33 – 4.85)	0.005
Chronic kidney disease	2.10(1.36 – 3.26)	0.001
Peripheral vascular disease	1.22 (0. 44- 3.39)	0.708
HR < 60/min on admission	1.8(1.03 – 3.16)	0.04
Shock	16.82(10.29 – 27.5)	< 0.001
Left ventricular failure	2.43(1.58 – 3.73)	< 0.001
Admitted on holidays	1.88 (0.96 – 3.67)	0.06
Admitted with dyspnoea	1.80 (1.15 – 2.8)	0.009
STEMI	1.92 (1.27 – 2.90)	0.002

Table-VI

Discharge medical therapy prescriptions, by acute coronary syndrome type

Discharge treatment	Totaln (%)	STEMI (%)	NSTEMI (%)	UA (%)	p value
Aspirin	1828(95.5)	749(98.3)	718(94.5)	361(92.1)	<0.001
Clopidogrel	1627(85.0)	625(82.0)	670(88.2)	332(84.7)	<0.001
Prasugrel	243 (12.7%)	146(19.2%)	71 (9.3%)	26 (6.6%)	<0.001
DAPT	1784(93.2)	738(96.9)	708(93.2)	338(86.2)	<0.001
Aspirin+ Clopidogrel	1623(84.8)	625(82.0)	670(88.2)	328(83.7)	0.003
Aspirin+ Prasugrel	243 (12.7%)	146 (19.2%)	71 (9.3%)	26 (6.6%)	<0.001
Beta-clocker	904 (47.3)	367(48.3)	430(56.5)	180(45.9)	0.005
Statin	1464 (82.8)	571(83.7)	568 (81.4)	325(83.8)	0.437
ACEI/ ARB	280 (41.1)	237(34.0)	169(43.6)	169(43.11)	0.002
Nitrate	1349 (76.3)	529(77.6)	547(78.4)	273(70.4)	0.007
Trimetazidine	1241(70.2)	497(72.9)	515(73.8)	229(59.0)	<0.001
All 4 drugs: DAPT, beta-blocker, ACE-I/ARB, statin	207 (11.7)	108(15.8)	59(8.5)	40(10.3)	<0.001

Table-VII

Comparison of characteristics of ACS patients from registries in developed and developing countries

Registry	Mean age (years)	Sex(male %)	HTN %	DM %	DL %	Smoking %	STE-MI %	NST-EMI %	UA %	CAG rates %	PCI rates %	PPCI rates %
Bangladesh	57.8 ± 12.1	71.4	74.2	68.9	53.2	25.8	39.8	39.7	20.5	53.4	26.6	6.2
Kerala ACS Registry[8]	60.4 ± 12.1	77.4	48.4	37.6	N/A	34.4	37	31	32	19.5	11.9	N/A
CREATE Registry[7]	57.5 ± 12.1	76.4	37.7	30.4	N/A	40.2	60.6	39.4*	—	23.2	7.5	
Gulf RACE Registry[16]	55 ± 12	76	46	38	31	45	39	32	29	22	N/A	7
SPACE Registry[17]	58 ± 12.9	77.4	55.3	58.1	41.4	32.4	41.5	58.5*	—	67.2	35.3	17.5
GRACE Registry [18-19]	64± 13	72	50§	21§	35§	62§	30	25	38	55	40	18
Malaysian NCVDACS Registry[11]	59 ± 12	75	72.6	55	55.9	57	42	33	25	35	46	8
CPACS Registry, China[14]	64.4	67	59.7	21.2	32.9	52.3	43	11	46	56.8§ï	52.7§ ï	16.3
TRACS Registry[13]	63.5 + 12.8	67.5	59.5	50.7	83.2	32.1	54.9	33.1	12	44.3	42.05	24.7
ACCESS Registry[21]	59	81	56.73	35.87	41.46	40.32	46	54*	—	57.85	35.29	
The Euro Heart Survey on ACS (I) [2,23]	65.2	67.5	51.6§	21.1§	46.8§	63.1§	42	51*	—	56.3§	40.4§	37
Euro Heart Survey – ACS II [23]	64.7	70.1	50.0§	21.4§	43.2§	45.6	47	48*	—	70.2§	57.8§	59
NCDR ACTION AR-G Registry[24]	60§	71.3§	62.5§	22.7§	52.2§	43.7§	-	-	-	93	81.5	83

For STEMI only * NSTE-ACS î admitted to level 3 hospital

nitrates (76.3%) were the next most commonly prescribed class of medications after antiplatelet drugs. 367 (48.3%) of patients with STEMI were prescribed beta-blockers. STEMI patients (15.8%) were the most likely to receive four drug classes known to have mortality benefit after ACS (i.e. DAPT, beta-blocker, ACE-inhibitor and statin.

Discussion

To the best of our knowledge, these data represent the largest contemporary ACS registry in Bangladesh, to date. It provides insight into the descriptive epidemiology, practice patterns and in-hospital outcomes of Bangladeshi ACS patients presenting to a tertiary cardiac centre. Table 7 represents a comparison of characteristics of ACS patients from different registries worldwide.

The mean age of our subjects was a relatively young age of 57.8 ± 12.1 years, which is comparable with those of the CREATEand middle eastern registries (GulfRACE and SPACE)[7, 16, 17],marginally lower than the Kerala ACS

registry[8] and ACCESS registry[21], but significantly younger than those of Thai ACSRegistry, GRACE, ACTION AR-G and other European registries[13, 18, 22-24], reflecting the younger presentation of ACS among Bangladeshis.

Approximately three-fourths of our ACS population was male, an observation seen across all ACS registries worldwide. In terms of risk factor distribution, 74.2% had hypertension, 68.9% had diabetes, 53.2% had dyslipidaemia and 25.8% had a history of smoking. These rates of smoking may be underestimated owing to lack of data in some patient records. Hypertension,diabetes and dyslipidaemia showed much greater incidence in our population in comparison to other Asian and Western registries. In fact, the incidence of diabetes we report may be one of the highest rates of diabetes in an ACS population, which is triple the rates reported in the multinational GRACE registry[18,19], and almost double the rates reported in Indian studies[7,8]. The presence of CKD, an additional risk factor contributing to poor outcome, was as high as 20.7% in this ACS population, possibly linked to the high prevalence of concomitant diabetes and hypertension. CKD has not been well-documented in other ACS registries, however, we found in our study that CKD posed significant mortality risk (odds ratio 2.1, p<0.001). The clustering of these co-morbidities may be responsible for ACS presentation at a much younger age in our population, as well as for the marginally increased overall mortality rate observed in our registry. Similarly, in a sub analysis of Gulf RACE registry, diabetic patients presenting with ACS were more likely to have a clustering of additional co-morbidities and were at risk of more adverse non-fatal hospital outcomes[31].

In this study, STEMI patientswere younger than those with NSTE-ACS. They had fewer risk factors, and a less frequent history of prior cardiac disease or intervention; they were, however, more often smokers, and significantly higher in-hospital mortality rate, compared to NSTEMI. These findings reflect those observed in regional registries such as CREATE, Kerala ACS and ACCESS[7,8,21], as well as those from high income countries (AR-G registries-ACS II registries)[22-24], reflecting a pattern of a generally greater co-morbidities and higher number of risk factors among NSTE-ACS patients.

There was almost equal presentation of STEMI and NSTEMI as admission diagnosis, in this series. This is in contrast to most Asian registries and the GRACE registry, where STEMI was the most common presentation of ACS[7,8,11,13,16]. In both the Euro Heart Surveys, SPACE registry and a more contemporary Indian study, NSTEMI was the more common diagnosis[9,16,22,23].53.4% of all ACS patients in our registry underwent coronary angiography. This is comparable with GRACE and Euro-Heart SurveryACS-Iregistry [18, 22, 23], and significantly higher in comparison to Indian registries, as well as Gulf RACE[7,8,16]. The higher angiographic rates could largely be driven by the relatively more affluent socio-economic status of patients being admitted in this hospital, as well as the more contemporary nature of our data. A PCI rate of 26.6% is also higher than other registries in the region, albeit substantially lower than Middle Eastern and Western registries (Table7). 43% of patients who underwent PCI had presented with STEMI, among whom only 6.2% underwent primary PCI. This relatively lower rate is comparable to Gulf RACE and Malaysian NCVD ACS registry [11, 16], but is staggeringly lower than rates of high income countries. Explanations for this lower rate are multifactorial: it may be due to the unavailability of primary PCI facilities during night hours, and also due to educational and cultural factors such as patient refusal to undergo an 'invasive' procedure immediately after admission, preferring a more conservative approach in the initial days of admission.

However, a much higher number of overall STEMI patients undergoing PCI were given a DES (84.3%), in comparison to 39% in ACCESS and 26% in GRACE[18, 21]. Of the 5.5% in whom primary PCI was done, 85.4% received a DES. This may reflect the more contemporary nature of our data and the increased use of DES over time.

93.2% of our patients received DAPT at discharge, among whom 85% were given clopidogrel, and 12.7% prasugrel as P2Y12 blocker. Compared with the Kerala registry, patients in our study were more likely to receive most key evidence-based ACS medications on discharge prescriptions, except beta-blockers, which were prescribed less (47.3% vs 62.7% in Kerala registry)[8].The lower rates of prasugrel reflect a new entry of the drug into the local arena;ticagrelor was unavailable in the country during the time of this study.

The overall in-hospital mortality rate of 7.6% is comparable to data from CREATE[7] and the Malaysian NCVD registry[11], but higher than those observed in registries from high income countries, and the Kerala registry[8]. This may be due to the increased prevalence and clustering of more than one cardiovascular risk factor among study subjects. Although NSTE-ACS patients had worse prior histories and more risk factors, their mortality was lower than STEMI patients, reflecting similar observations of prior studies[21].

Limitations

Due to the retrospective nature of the study, the data were observational, which limits our ability to evaluate causation, and correlation to prominent ACS risk scores for predicting outcomes such as the GRACE risk score and Thrombolysis in Myocardial Infarction (TIMI) risk score. Due to logistical

reasons, data collected were of in-patients, and do not take into account the highest risk patients who expired in the emergency room (ER) prior to admission; as such, mortality rates may be underestimated. The absence of follow up data and post-discharge event rates are an additional limitation.The socio-economic status of the patients was not documented, a factor that largely influences patients' ability to finance coronary angiography and PCI, both of which are important predictive factors access to health care and consequent outcome. Also, as data was limited to the capital city where patients finance care by themselves, it may not be geographically or socioeconomically representative on the entire Bangladeshi population, in terms of risk factor and mortality rates.

Conclusion

To the best of our knowledge, this study represents one of the larger single centre analyses of ACS patients in Bangladesh thus far. Bangladeshi subjects with ACS tend to be younger, with high prevalence of cardiovascular risk factors particularlydiabetes. In-hospital mortality rates were comparable to some South and East Asian registries, but higher than those of developed countries in Europe and the Americas.Management strategies were more conservative than those reported in Western populations, and there is room for further improvement in terms of guideline-directed therapy, both pharmacotherapy and interventional, in order to improve outcomes among ACS patients.

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