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Acute Coronary Syndrome in Slemani, Iraqi Kurdistan

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Abstract

Background and objectives: Ischemic heart disease still accounts for major cause of cardiovascular disease and death worldwide. Its incidence has increased dramatically over the last decade. Presentation and management outcomes of Acute Coronary Syndrome is affected considerably with age, sex and race. The objective of this study was to assess epidemiological characteristics and analyze angiographic findings of patients.

Methods: This is an observational cross-sectional study carried out on 440 patients with acute coronary syndrome who were admitted from April to June 2024 to Slemani Cardiac Hospital and for whom coronary angiography was done. Percentages of patients with regard to age and sex determined, and angiographic characteristics identified as whether patients were right or left dominant, and number significant lesions they had. Management outcomes were also studied as if they were treated with stent, referred to open heart surgery, or just treated medically. Moreover, these angiographic findings were correlated in males with females.

Results: The results revealed that nearly two third of the patients (69%) were males. Most common age presentation was 50-60 years old (34%), while only 14% and 27% were among age groups of 40-50 and 60-70 years old, respectively. Nearly 85% of the patients were right dominant (93% of males, compared to 85.5% of females). A significant number of the patients had other significant coronary artery disease in addition to culprit lesion (104 out of 440 patients), while non-significant obstructive artery disease observed more in women (32%) compared to only 20% of males, which is statistically significant. Percutaneous coronary intervention was the most frequent modality of treated (54% of all the patients).

Conclusions: Acute coronary syndrome is quite common in this locality and plan is needed to target both primary and secondary prevention strategies.

Keywords: Acute coronary syndrome, Coronary artery bypass grafting, Region of Kurdistan, Slemani

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Introduction

Acute coronary syndrome (ACS) occurs when there is sudden limitation of blood flow to the myocardium. It can be of three types: unstable angina, non-ST elevation myocardial infarction (non-STEMI) and ST elevation myocardial infarction (STEMI). Non-STEMI is differentiated from unstable angina by elevation of cardiac biomarkers as a result of myocardial necrosis caused by ischemia. Diagnosis of STEMI is established when symptoms are accompanied with ST-elevation on surface ECG for >20 minutes.[1] ischemic heart disease (IHD) remains a major cause of cardiovascular disease and death all over the world. In 2015, it accounted for 8.9 million deaths, higher than any other cause worldwide.[2] The number increased to 9.14 million deaths in 2019, in part because of increase in populations with hypertension (HTN), diabetes mellitus (DM) and obesity.[3] Latin America, the Middle East and the Far East faced the highest rise in the number of cardiac events.[4] The presentation of patients with ACS is widely influenced by sex, age and race.[5] It usually manifests 10 years later in women than in men, and the incidence is increasing with advancing age in both sexes. Moreover, myocardial infarction (MI) occurs more frequently in black people, regardless of age and sex.6,7 Acute coronary syndromes can manifest in a variety of ways.[6] Chest pain is the most common symptom, associated sometimes with shortness of breath, nausea, burning sensation, restlessness, faintness, or sense of impending death Although resting 12-lead ECG may be normal, it should be done in all patients with chest pain, unless there is a clear non-cardiac cause.[7,8] Furthermore, blood biomarkers such as high-sensitivity cardiac troponin (hs-cTn) have an important role in the diagnosis and risk stratification of patients suspected to have NSTE-ACS.[8] Echocardiography provides valuable information about left and right ventricular functions, and valvular and other anatomical and functional abnormalities. The presence of regional wall motion abnormalities helps delineate which artery territory has likely been the culprit artery.[3,9-11] The management of patients with NSTEMI has changed considerably during the last several years. Over the last decade, the 6-month mortality of patients with NSTEMI has declined because an increasing number of such patients received early angiography (<72 hours) and invasive therapy.[12] With regards to STEMI, timely performed percutaneous coronary intervention (PCI), within 12 hours of symptoms onset and 2 hours from diagnosis, by an experienced team is the ideal reperfusion strateg.[13] The current study was undertaken to assess the hospital-based incidence, epidemiological and angiographic characteristics of patients with ACS in Slemani province, Region of Kurdistan, Iraq in light of the relevant literature.

Patients and methods

This was an observational cross-sectional study that was carried out in Slemani Cardiac Hospital, Kurdistan, Iraq, from April to June 2024. Inclusion criteria were any patient with acute coronary syndrome admitted to Slemani Cardiac Hospital over that period for whom coronary angiography was undertaken. Exclusion criteria were patients with chronic coronary syndrome, and those with acute coronary syndrome who were treated non-invasively. Epidemiological characteristics of the patients in terms of age and sex were obtained, and angiographic findings analyzed with regard to whether they were right or left dominant, how many significant lesions found and how they were treated. Angiographic characteristics were further studied with regard to sex differences. Patients' privacy and confidentiality respected. Study was approved by Slemani Cardiac Hospital Ethical Committee. The P values were measured to assess the impact of gender on selected variables. In this study,

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the right coronary artery (RCA) was considered dominant if it gave off the posterior descending artery and supplied the posterior portion of the interventricular septum. On the other hand, if this territory was supplied from left circumflex (LCX) artery, the left coronary artery was considered dominant and if the supply was shared by the RCA and LCX, it was considered co-dominant.[14] A significant coronary lesion was defined as 70% or more stenosis in a main artery, or branches with diameters >2 mm. Ad-hoc PCI was defined as PCI performed in the same session as index diagnostic coronary angiography while non-ad hoc PCI referred to PCI performed in a separate session after diagnostic coronary angiography.

Results

During the study period, 631 patients with ACS were admitted to Slemani Cardiac Hospital accounting for a hospital-based incidence of 2,524 patients per year. A total of 440 patients with ACS were eligible for diagnostic coronary angiography and were enrolled in the study. There were 302 males (69%) and 138 females (31%) with a male to female ratio of 2.18 to 1, Table (1).

Table (1): The age distribution of the patients

Age (years)	Number of Patients	Percentage
30-40	9	2 %
41-50	62	14%
51-60	151	34%
61-70	120	27%
≥70	98	23%
Total	440	100%

The age of the patients ranged from 27 years to 92 years with a mean of 59.89 ± 11.023 years. Most patients (n=369, 83.9%) were above the age of 50 while younger patients (below 50) constituted the minority (n=71, 16.1%). Majority of the patients in this study (n=307, 83.5%) had right coronary artery dominance while the remainder patients, had either left coronary artery dominance (n=40, 9%) or coronary artery co-dominance (n= 33, 7.5%), Table (2).

Table (2): The number and percentage of patients who had right, left or co-dominant coronary arteries.

Dominant Coronary Artery	Number of Patients	Percentage
Right	307	83.5%
Left	40	9%
Co-dominant	33	7.5%
Total	440	100%

Table (3): The pattern of CAD in the studied patients.

Number of vessels with significant lesions	Number of Patients	Percentage
1-vessel disease	138	31%
2-vessels disease	100	23%
3-vessels disease	104	24%
No significant lesion	98	22%
Total	440	100%

Almost one third of the patients (n=138, 31%) had significant lesion in one vessel, while 47% had lesions in more than one vessel (23 % had 2-vessels disease and 24% had 3-vessels disease), Table (3). No significant coronary artery lesion was found in 98 (22%) patients who could be categorized as Myocardial Infarction with Non-Obstructed Coronary Arteries (MINOCA). All patients received appropriate medical treatment. In patients scheduled for revascularization, the coronary vessels were assessed with diagnostic angiography, and depending on the lesions and patients' characteristics, further management was decided; either PCI, optimum medical therapy (OMT) or coronary artery bypass operation (CABG). Some stable patients with NSTEMI were left for multidisciplinary team (MDT) discussion

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mainly because of the complexity of their lesions, Table (4).

Table (4): The numbers and percentages of patients who received medical treatment, PCI, CABG operation, or left for further discussion.

Type of Treatment	Number of Patients	Percentage
PCI	237	54%
CABG	56	13%
Medical Treatment	107	24%
MDT and/or Family Discussion	40	9%
Total	440	100%

More than half of the patients (n=237, 54%) received PCI, one quarter (n=107, 24%) continued on medical therapy, while CABG was offered for (n=56, 13%) patients. Multidisciplinary team (MDT) opinion was sought in (n=40, 9%) of cases. Women had more right coronary artery dominance than men (93% vs. 85.5%). Left coronary artery dominance was more frequent among males (8.5% vs. 1.5%). Coronary co-dominance was equivocal among both genders. Women presented much older with ACS than men; the majority being ≥70 compared to men. Non-significant lesions or normal coronaries (MINOCA) were more frequent in women than in men. This may account for more frequent medical therapy in women compared to men, Table (5).

Table (5): The sex differences in relation to right or left dominance, number of significant vessels and management outcome

Coronary dominance	Females	Males	p value
Right	93%	85.5%	0.025
Left	1.5%	8.5%	0.051
Co-dominance	5.5%	6%	0.83
Age (years)	Females	Males	P value
30-40	0.7%	2.5%	0.2
41-50	9.5%	17%	0.03
51-60	17.5%	38.5%	<0.001
61-70	27%	30%	0.52
≥70	45.3%	12%	<0.001
Diseased Vessels	Females	Males	P value
1	26%	34%	0.09
2	17%	25%	0.06
3	27%	22%	0.25
No significant lesion	30%	19%	0.01
Treatment	Females	Males	P value
PCI	52%	56%	0.43
CABG	10%	14%	0.24
OMT	32%	20%	0.006
MDT Opinion	6%	10%	0.16

Discussion

Middle East is one of the regions with very high incidence of ischemic heart disease with an increasing incidence among young adults.[15] According to the present study, the hospital-based incidence of ACS in Slemani is 2,524 per year. We observe a high rate of ACS in our region. We further observed that majority of the patients were middle-aged men. These are consistent with the international studies showing that males were nearly 3 times more than females, and presenting nearly 10 years younger.[16,17] This should be investigated further as to whether related to protective hormonal factors in women, or worse eating habits, work-related stress and more smoking among men than women. In majority of people, the right coronary artery (RCA) supplies the posterior portion of the interventricular septum and gives off the posterior descending artery, in which case it is said to be right dominant. In the remainder minority population, supply of this territory is from left circumflex artery (LCX) (left dominant) or shared by the RCA and LCX (co-dominant).[18] Similar to what other authors have reported.[19], our results showed that right coronary artery dominant population was 83.5%, while left coronary artery dominant and co-dominant populations were 9% and 7.5% respectively. Near one third of patients in this series had one-vessel disease, while nearly half of the patients had more than one coronary artery

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with significant lesions. In contrast, 22% of the patients had no coronary artery with significant lesion apparent on the coronary angiogram. These might include patients with microvascular ischemia, or type 2 MI (an imbalance between myocardial oxygen demand and supply, leading to myocardial ischemia).[19,20]More than half of the patients (54%) in this series, were treated with PCI, 13% with CABG and 24% with medical management. Comparing these findings with a study done in Czech Republic,[20] a higher percentage of our patients received medical management alone. This could be attributed to variable reasons such as patients' frailty, multiple co-morbidities, complexity of coronary lesions and higher incidence of non-significant lesions detected on the coronary angiograms. Similar to our findings, previous researches have shown that patients with ACS in the absence of angiographically evident obstructive coronary artery disease were twice more common in women compared to men.[21] Other studies showed left coronary dominance rates were higher among the male patients; a finding similar to ours. [22]

Conclusions

Acute coronary syndrome is increasingly prevalent in the city of Slemani, across all age groups and in both sexes. Patients were treated appropriately with coronary intervention yet a significant portion were not amenable to medical or invasive treatment and they were referred for open heart surgery. Further workup plan is needed to diagnose and improve both primary and secondary prevention strategies.

Conflict of Interest

None.

References

1.Braunwald E, Morrow DA. Unstable angina is it time for a requiem? Circulation. 2013;127(24):2452–6.

2.Roth GA, Mensah GA, Johnson CO, Addolorato G, Ammirati E, Baddour LM, et al. Global Burden of Cardiovascular Diseases and Risk Factors, 1990-2019: Update from the GBD 2019 Study. J Am Coll Cardiol. 2020;76(25):2982–3021.

3.Puymirat E, Simon T, Cayla G, Cottin Y, Elbaz M, Coste P, et al. Acute myocardial infarction: Changes in patient characteristics, management, and 6-month outcomes over a period of 20 years in the FAST-MI program (French registry of acute ST-elevation or non-ST-elevation myocardial infarction) 1995 to 2015. Circulation. 2017;136(20):1908–19.

4.Ferreira-González I. The epidemiology of coronary heart disease. Rev Esp Cardiol (Engl Ed). 2014;67(2):139–44.

5.Bergmark BA, Mathenge N, Merlini PA, Lawrence-Wright MB, Giugliano RP. Acute coronary syndromes. Lancet. 2022; 399:1347–58.

6.Hess CN, McCoy LA, Duggirala HJ, Tavris DR, O'Callaghan K, Douglas PS, et al. Sex-based differences in outcomes after percutaneous coronary intervention for acute myocardial infarction: A report from TRANSLATE-ACS. J Am Heart Assoc. 2014;3(1):1–10.

7.Virani SS, Alonso A, Benjamin EJ, Bittencourt MS, Callaway CW, Carson AP, et al. heart disease and stroke statistics—2020 update a report from the American Heart Association. Circulation. 2020 Mar 3;141(9): e139-e596. doi: 10.1161/CIR.0000000000000757. Epub 2020 Jan 29.

8.Williams RP, Manou-Stathopoulou V, Redwood SR, Marber MS. 'Warm-up Angina': harnessing the benefits of exercise and myocardial ischaemia. Heart. 2014;100(2):106–14.

9.Cohn PF, Fox KM, Daly C. Silent myocardial ischemia. Circulation. 2003;108(10):1263–77.

10.Daly CA, De Stavola B, Fox KM. Predicting prognosis instable angina-results from the Euro heart survey of stable angina:

Prospective observational study. Br Med J. 2006;332(7536):262–7.
11.Cerqueira MD, Weissman NJ, Dilsizian V, Jacobs AK, Kaul S, Laskey WK, et al. Standardized myocardial sementation and nomenclature for tomographic imaging of the heart: A Statement for Healthcare Professionals from the Cardiac Imaging Committee of the Council on Clinical Cardiology of the American Heart Association. Circulation. 2002;105(4):539–42.
12.Thiemann DR, Coresh J, Oetgen W, Powe NR. The Association Between Hospital Volume and Survival After Acute Myocardial Infarction in Elderly Patients. N Engl J Med. 1999;340(21):1640–8.
13.Sukul D, Bhatt DL, Seth M, Zakroysky P, Wojdyla D, Rumsfeld JS, et al. Appropriateness and Outcomes of Percutaneous Coronary Intervention at Top-Ranked and Nonranked Hospitals in the United States. JACC Cardiovasc Interv. 2018;11(4):342–50.
14.Abu-Assi E, Castiñeira-Busto M, González-Salvado V, Raposeiras-Roubin S, Riziq-Yousef Abumuaileq R, Peña-Gil C, et al. Coronary Artery Dominance and Long-term Prognosis in Patients with ST-segment Elevation Myocardial Infarction Treated with Primary Angioplasty. Rev Española Cardiol (English Ed. 2016;69(1):19–27.
15.El-Menyar A, Zubaid M, Rashed W, Almahmeed W, Al-Lawati J, Sulaiman K, et al. Comparison of Men and Women with Acute Coronary Syndrome in Six Middle Eastern Countries. Am J Cardiol. 2009;104(8):1018–22.
16.Jeffrey J, Scott K, Deepak L. Coronary arteriography and Intra-Coronary Imaging. In: Mann DL, Zipes DP, Libby P, Bonow RO, Braunwald E, editors. Braunwald's heart disease: a textbook of cardiovascular medicine Part 1. 10th ed. Philadelphia, PA: Elsevier/Saunders; 2017.
17.Neumann JT, Sörensen NA, Rübsamen N, Ojeda F, Renné T, Qaderi V, et al. Discrimination of patients with type 2 myocardial infarction. Eur Heart J. 2017; 38:3514–20.
18.Tousek P, Tousek F, Horak D, Cervinka P, Rokyta R, Pesl L, et al. The incidence and outcomes of acute coronary syndromes in a central European country: results of the CZECH-2 registry. Int J Cardiol. 2014;173(2):204–8.
19.Abizaid A, Kornowski R, Mintz G, Hong M, Abizaid A, Mehran R, et al. The influence of diabetes mellitus on acute and late clinical outcomes following coronary stent implantation. J Am Coll Cardiol. 1998;32(3):584–9.
20.Pasupathy S, Air T, Dreyer RP, Tavella R, Beltrame JF. Systematic review of patients presenting with suspected myocardial infarction and nonobstructive coronary arteries. Circulation. 2015;131(10):861–70.
21. Abizaid A, Kornowski R, Mintz G, Hong M, Abizaid A, Mehran R, et al. The influence of diabetes mellitus on acute and late clinical outcomes following coronary stent implantation. J Am Coll Cardiol. 1998;32(3):584-9.
22. Pasupathy S, Air T, Dreyer RP, Tavella R, Beltramae JF. Systematic review of patients presenting with suspected myocardial infarction and non-obstructive coronary arteries. Circulation. 2015;131(10):861-70.

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