Original Paper

Current Practice in Management of Acute Coronary Syndrome in Tertiary Iraqi Cardiac Centers

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Abstract

Background There is continued debate as to whether a routine, early invasive strategy is superior to a conservative strategy for the management of acute coronary syndromes.

Aim of the study: To verify current practice in the setting of management of acute coronary syndromes in tertiary cardiac centers in Iraq.

Patients and methods Four hundred (400) patients were included in this study from 1st of January 2012 to 1st of January 2013from two tertiary Iraqi cardiac centers. Three hundred (300) patients from Ibn Albitar hospital and One hundred (100) patients from Iraqi center for heart disease refered to them as group (A) and group (B) respectively.

Results & discussion Mean age for all patients was54.6±9.9 year. In group A there was 208 male patients (69.3%), 92 female patients (30.6%), in group B there was 65 male patients (65%), 25 female patients (25%).

Low score (using thrombolysis in myocardial infarction score) found in 166(41.6%), intermediate score in 221 (55.3%), high in 13 (3.3%), no patients with high score was found in group B, mean TIMI score in group A was 1.61±0.5, in group B was 1.60±0.5 (P value NS). In group A UA found in 249 (83%), STEMI in 23 (7.7%), NSTEMI in 28 (9.3%).In group B UA in 79 (79%), STEMI in16 (16%), NSTEMI in 5 (5%) (Pvalue0.02). Smoking is prevalent more in group A (186 patients (62%) versus 43 patients (34%) in group B), while diabetes mellitus and family history of premature coronary artery were more prevalent in group B (Pvalue0.03).

All patients in group A with low score were treated medically while in group B with low score treated invasively. Invasive approach was more in group B compared with group A in intermerdiate risk score.

Normal coronaries were found in (3.3%) in group A versus (6.8%) in group B. Percutaneous coronary intervention was applied in (66.6%) in group A versus (50%)in group B, surgery used in (23.3%)in group A versus (28.3%)in group B, medical treatment in (10%) in group A versus (21.6%) in group B.

There were no statistical difference between both groups regarding duration of admission to hospital and mortality.

Conclusion Management of acute coronary syndromes was the same between tertiary cardiac centers and it is progressing significantly in our country.

Keywords: acute coronary syndrome, Iraqi cardiac centers

Introduction

The term acute coronary syndromes describe a spectrum of clinical syndromes that range from unstable angina to non ST segment elevation and ST segment elevation MI. Patients who present with ACS are divided into those with ST elevation or new LBBB and those with non ST elevation including unstable angina and NSTEMI[1,2] .

The five major causes of ACS are thrombus, mechanical obstruction, dynamic obstruction, inflammation and increased demands [3].The major path physiological mechanism is rupture or fissuring of an atheromatous plaque with superimposed thrombus[4,5,6 and 7].

Superficial fissuring of a plaque usually result in platelet deposition, but there is less superimposed thrombus formation in patient with UA than in those with Qwave MI,which is usually associated with deep arterial injury and occlusive thrombus[6 and 7]. Angioscopic findings showed that the thrombus associated with UA is white or gray and consist mostly of platelets, whereas the thrombus in patient with acute MI consist mostly of red blood cells[8].

Coronary artery ostial stenosis may occur after repair of a transposition of the great arteries in the neonatal period.An aberrant left main coronary artery with its origin at the right sinus of Valsalva may cause ACS, especially with exertion [9].

Coronary artery disease (CAD) is the most common serious, chronic and life threatening illness. This condition causes more deaths, disabilities and economic costs than many other illnesses. [10]. In 2001 ,CAD accounted for 54% of all deaths due to cardiovascular disease and was the single most frequent cause of death in men and women resulting in more than 1 in 5 all over the [10].

In the last two decades these 2 modalities had undergone great advances , in spite of that the introduction of percutaneous coronary revascularization and the huge advances with equipments and technique had revolutionized the management of coronary artery disease. In May, 1977, in san Francisco, Gruentzig, Myler, and Hanna performed coronary angioplasty for the 1st time in living humans [11]. Initial problems with intracoronary stenting included access site complications and subacute thrombosis.Stent thrombosis occurred in < 1 % of patients undergoing stenting due to improved technology by using high pressure stenting which was 1st introduced by Antonio Columbo in 1994, and the periprocedural use of thienopyridines in addition to aspirin by (Marie –Claude Maurice and others) in 1994[12,13and 14].Drug eluting stent 1st used at 2000 to overcome problems of baremtal stent [15].

In Iraq the first PTCA was performed in 1993 by Dr.Omar AL-Kubaisee and Dr.Nabil Hasso and stenting for first time was done by Dr.Talib Khair-Allah in 1997[16].

In 2006, cardiovasculer disease was the second most commonly reported longstanding illness in Great Britain (after musculoskeletal conditions) [17].

Coronary heart disease is the leading cause of death in the United States. According to the American Heart Association, someone in the United States suffers a coronary heart event approximately every 29 seconds, and someone dies from such an event approximately every 60 seconds. Estimated 1.2 million new or recurrent coronary attacks in the USA in 2004 (American Heart Association, 2004) [18].

Several randomized trials had studied the differences between invasive and conservative way in management of ACS.Trials that showed benefit of early invasive strategy (within 24-48 hours of admission) included:-FRISC ll,TACTICS-TIMI 18, RITA 3,IASAR-COOL,while those showing no benefits or increase in mortality included:-TIMI IIIB,VANQWISH and ICTUS trials[19].

(TIMI) IIIB trial studied 1473 patients, 740 underwent early invasive treatment with angioplasty or coronary artery bypass surgery while 733 underwent conservative medical treatment. At one year there was no significant difference in death or repeat heart attack [20].

VANQWISH trial studied 920 non-Q wave myocardial infarction patients, 396 had a history of prior myocardial infarction and 524 did not. Patients with a history of prior myocardial infarction were older and had a higher incidence of multiple high-risk baseline characteristics than those

with a first non-Q wave myocardial infarction. Compared to the group with a first myocardial infarction, the prior myocardial infarction group suffered more events at both 1 month and at 12 months. Patients with a first non-Q wave myocardial infarction may fare better with a conservative or ischaemia-guided approach during the first post infarction year [21].

The FRISC II trial studied 2,457 patients from 58 Scandinavian centers who had unstable symptomatic coronary artery disease were divided into 2 groups. Group 1 consisted of 1222 patients who underwent an invasive strategy were compared to 1235 patients (Group 2) who were treated noninvasively. The mortality rate at the end of one year was 2.2% in the invasive group compared to 3.9 % in the noninvasively treated group [22] .

TACTICS-TIMI 18 trial studied 2475 patients 1106 patients treated conservatively, 1114 patients treated invasively, this trial shows that an invasive strategy with early coronary angiography and revascularization is superior to an initial strategy of medical stabilization in patients admitted with ACS [23].

RITA 3 trial enrolled 1810 patients, there were 504 patients in the angioplasty and 514 in the medical therapy group. An invasive strategy is preferable to a conservative strategy in patients with non ST elevation ACS, mainly because of less refractory angina. There was no increased risk for death or MI [24].

ICTUS trial studied 1200 patients in 42 hospitals in The Netherlands between 2001 and 2003.604 patients treated invasively, 596 patients treated with selective invasive way,at 3year follow up no differrnce in the rate of all-cause mortality or cardiac death between the two groups [25].

Patients and Methods

The study was conducted at Ibn Albitar hospital and Iraqi center for heart disease. A total of four hundred (400) patients were included in this study from 1st of January 2010 to 1st of January 2011.Three hundred (300) patients from Ibn Albitar hospital and One hundred (100) patients from Iraqi center for heart disease refered to them as group (A) and group (B) respectively.

Variable data were taken from the patients as follows: age, gender, smoking (current smoker, ex-smoker or nonsmoker at all).Other risk factors for ischemic heart disease were taken from patients as follow:-

1- Hypertension:-defined as blood pressure of 140/90 or more, in two or more separated occasions, or history of hypertension on anti-hypertensive medication.

2- Diabetes mellitus:- defined as symptoms of D.M (polyuria , polydipsia,..) plus random blood glucose concentration more than 200mg/dl or fasting plasma more than 126mg/dl or two hours plasma glucose more than 200mg/dl during oral glucose tolerance test, or previous history of D.M on oral hypoglycemic medication or insulin therapy.

3- Dyslipideamia:- was defined by any of the followings : -

   - Total serum cholesterol > 200 mg /dl

   - Serum LDL-cholesterol > 1oo mg/dl

   - Serum HDL-cholesterol < 40 mg /dL in men &< 50 mg /dl in women

- Serum TG > 150 mg/dl

4- Obesity:-defined as body mass index (BMI) >30km/m2.BMI was calculated according to the equation

B.M.I= body weight in Kg/(height in meters)^2 .

Normal B.M.I (18-24.9)kg/m^2.

Over weight (25-29.9) kg/m^2.

Mild obesity (30-34.9) kg/m^2.

Moderate obesity (35-39.9) kg/m^2.

Morbid obesity ≥40 kg/m^2.

5- Family history of premature coronary artery disease:- Family history of premature CAD (CAD in male 1st degree relative <55 years , CAD in female 1st degree relative <65 years) or sudden cardiac death.

ECG was done for all patients, blood samples were withdrawn and tested for RBS, lipid profile, renal function test and troponin (STANDARD BIO LINE TROPONIN I TEST KIT, GERMANY). Echocardiography also done for all patients.

Exclusion Criteria:-

1-Severe reactive airway diseases:-

2-Renal failure (serum creatinine≥2 mg/dl):-

All patients were evaluated using TIMI score into low, intermediate and high risk groups depending on numbers of risk factors as follow:-

1-Low risk when 1-2 TIMI risk score factors were present.

2-Intermediate risk when 3-5 TIMI risk score factors were present.

3-High risk when 6-7 TIMI risk score factors were present.

Patients were stratified into those with STEMI and patients without; the latter group was subdivided into those with NSTEMI and UA depending on troponin test. All patients given aspirin, clopidogrel, statin and heparin.

Statistical Analysis

All data were coded & enter to the computer by using statistical package of social science (SPSS 15).The association between different variables were measured by using Chi square test. P value below 0.05 consider as a level of significance.

Results

In this cross sectional retrospective study ,the mean age of group A was 54.08±9.1 year range (31-85 years),the mean age for group B was 56±11 year, range (34-80 years), The mean age of total sample was 54.6±9.9,no statistically significant difference was present between both groups regarding age as shown in table(2). Regarding gender distribution, in group A there was 208 male patients (69.3%),92 female patients (30.6%), in group B there was 65 male patients (65%),25 female patients (25%) ,no significant difference

was present between both groups as shown in table (3).

Smoking was prevalent more in group A; 186 patients (62%) versus 43patients (43%) in group B (Pvalue 0.01), while diabetes mellitus and family history of premature coronary artery disease were more in group B ; (45) patients (45%) versus 39 (31%) Pvalue0.01, 9 patients (9%) versus6 patients (2%) Pvalue 0.01 respectively, no significant difference was found regarding obesity between both groups, as shown in table (4).

STEMI was more prevalent in group B; 16 patients (16%) versus 23 patients (7.7%) in group A, while NSTEMI was more in group A 28 patients (9.3%) versus 5 patient (5%) in group B as shown in table (5), which was statistically significant Pvalue 0.02.UA was nearly the same in both groups; 249 patients (83%) in group A, 79 patients (79%) in group B as shown in table (5).

Normal ECG was found in 50 patients (16.7%) in group A and in 14 patients (14.1%) in group B, STsegment depression was more in group A; 62 patients (20.7%) versus 11 patients (11.1%) in group B which was statistically significant Pvalue 0.01 as shown in table (6).

Beta blockers were given in 294 patients (98%) in group A and in 82 patients in group B (Pvalue 0.01),thrombolytics were given in 20 patients (6.6%) in group A and in 10 patients (10%) in group B.ACEI was given in 148 patients (49.3%) in group A and in 67 patients (67%) in group B (Pvalue 0.01).GP2b3a inhibiters were given in 48 patients (32%) in group A versus 29 patients (29%) in group B (Pvalue NS). Calcium channels blockers were given in 13 patients (4.3%) in group A versus 10 patients (10.1%) in group B(Pvalue 0.01); B.blockers more in group A while ACEI, and calcium channel blockers more in group B, as shown in table (7).

There were no statistically significant difference between both groups regarding duration of admission to hospital; mean

duration of admission was 3.74±2.5 SD in group A and 3.88±2.5SD in group B as shown in table (8).

Mean TIMI score in group A was 1.61±o.58SD, in group B was 1.60±0.51SD showing no statistically significant difference as shown table (8).

In group A all patients with low score treated medically; 127 patients (100%) while 17 patients (44.8%) in group B treated invasively.16 patients (10%) with intermediate score treated medically versus 20 patients (32.2%) in group B , 144 patients (90%) versus 42 patients (67.3%) in group B treated invasively.7 patients (53.8%) with high score treated medically and 6 patients (46.2%) treated invasively in group A ,no high score was found in group B. These finding were statistically significant as shown in table (9) and (10) respectively, P value 0.01.

115 patients (38.3%) in group A and 40 patients (40%) in group B had EF <50%. All patients receive asperin, clopidogrel, statin and heparin. Positive troponin found in 148 patients (49.3%) in group A and in 45 patients (45%) in group B. Among patients managed invasively; left main stem disease was found in 12 patients(8%) in group A versus 5 patients (8.5%) in group B. single vessel disease in 71 patients (47.3%) in group A versus 27 patients (45.8%) in group B, two vessel disease in 24 patients(16%) in group A

versus 8 (13.4%) in group B, three vessel disease in 38 patients (25.3%) in group A versus 15 patients (25.4%) in group B.Normal coronaries were found in 5 patient (3.3%) in group A versus 4 patients (6.8%) in group B, as shown in table (11), percutaneous coronary intervention was applied in 100 patients (66.6%) in group A versus 30 patients (50%) in group B, surgery in 35 patients (23.3%) in group A versus 17 patients (28.3%) in group B, medical treatment in 15 patients (10%) in group A versus 13 patients (21.6%) in group B, as shown in table (12).

150(50%) patients in group A and 60(60%) patients in group B managed invasively.

No significant difference was found between both groups regarding gender and treatment given, in group A 95 patients(63.4%) were male and 23 patients (57.5%) in group B were male, treated medically, while 55 patients (36.6%) in group A were female and 17 patients (24.5%) in group B were female also treated medically, where as105 patients (70%) in group A and 42 patients (70%) in group B were male treated invasively,45 patients (30%) in group A were female and 18patients (30%) were female treated invasively as shown in table (13).Mortality rate in group A was 1.3% and 2% in group B.

Table 1. Shows Mean Age of Studied Sample

	Group	N	Mean	Std.Deviation
Age (years)	Group A	300	54.08	9.18
	Group B	100	56.23	11.70

Pvalue NS

Table 2. Shows Distribution of Studied Sample According To Gender

		Group A	Group B
gender	Males	208(69.3%)	66(66%)
	Females	92(30.7%)	34(34%)

P value NS

Table 3. Shows Distribution of Studied Sample According to Demographic Characters

Variables	GROUP A	GROUP B	
DM	93(31%)	45(45%)	Pvalue0.01
HT	135(45%)	55(55%)	Pvalue NS
SMOKING	186(62%)	43(43%)	Pvalue0.01
F.H	6(2%)	9(9%)	Pvalue 0.01
DYSIPIDEMIA	22(7.3%)	4(4%)	Pvalue NS
OBESITY	60(20%)	16(16%)	Pvalue NS

Table 4. Shows Mode of Presentation of Studied Sample

			Group		Total
			A	B	
Presentation	UA	Count	249	79	328
		% within group	83.0%	79.0%	82.0%
	STEMI	Count	23	16	39
		% within group	7.7%	16.0%	9.8%
	NSTEMI	Count	28	5	33
		% within group	9.3%	5.0%	8.3%
Total		Count	300	100	400
		% within group	100.0%	100.0%	100.0%

P value=0.027

Table 5. Shows ECG Findings the Sample Studied

Variables	Group A	Group B
Normal	50(16.7%)	14(14.1%)
ST depression	62(20.7%)	11(11.1%) P value=0.001
ANT.STelevation	13(4.3%)	10(10.1%)
T inversion	63(21%)	16(16.2)
ANT.Qwave	55(18.3)	25(25.3%)
INF Qwave	49(16.3%)	11(11.1%(
INF.ST elevation	8(2.7%)	7(7.1%)
LBBB	0	5(5.1%)

Table 6. Shows Mean TIMI Score and Mean Duration of Admission to Hospital

DOA(days)	Group A	300	3.74	1.64
	Group B	100	3.88	2.54
TIMI Score	Group A	300	1.61	.58
	Group B	100	1.60	.51

P value NS

Table 7. Shows Medical Treatment Given In Both Groups

Variables	Group A	Group B	
Thrombolytics	20(6.6%)	10(10%)	Pvalue NS
B.blockers	294((98%)	82(82%)	Pvalue0.01
ACEI	148(49.3%)	67(67%)	Pvalue0.01
GP2b3Ai	48(32%)	29(29%)	Pvalue NS
CCB	13(4.3%)	10(10.1%)	Pvalue 0.01

Table 8. Shows Relation between TIMI Score and Modality of Treatment in Group B

Score	Medical	Invasive	Total
Low	21(55.2%)	17(44.8%)	38(100%)
Intermediate	20(32.2%)	42(67.3%)	62(100%)

p.value=0.001

Table 9. Shows Relation between TIMI Score and Modality of Treatment in Group A

Score:	Medical	Invasive	Total
Low	127(100%)	0(0%)	127(100%)
intermediate	16(10%)	144(90%)	160(100%)
High	7(53.8%)	6(46.2%)	13(100%)

Pvalue=0.001

Table 10. Shows Number of Coronary Arteries Involved in the Invasive Group

VARIRBLES	GROUP A(150)	GROUP B(60)
LMS DISEASE	12(8%)	5(8.5%)
SVD	71(47.3%)	27(45.8%)
2VD	24(16%)	9(15%)
3VD	38 (25.3%)	15(25.4%)
NORMAL	5(3.3%)	4(6.8%)

Table 11. Shows Ways of Treatment in Patients Underwent Coronary Angiography

	Group A	Group B
PCI	100(66.6%)	30(50%)
Surgery	35(23.3%)	17(28.3%)
Medical	15(10%)	13(21.6%)
Total	150	60

Table 12. Distribution of Studied Sample According to Gender and Treatment

Type of treatment	Gender	Group A NO.( )%	Group B NO. ( )%
Medical treatment	Male	95(63.4%)	23(57.5%)
	Fmale	55(36.6%)	17(42.5%)
	Total	150(100%)	40(100%)
Invasive treatment	Male	105(70%)	42(70%)
	Female	45(30%)	18(30%)
	Total	21(100%)	60(100%)

Pvalue NS

Discussion

Coronary artery disease is the epidemic of our time and set to remain the single most important disease in the world in the terms of mortality, morbidity, disability and economic loss until 2020 year [26]. Mean age of our study is earlier than that found in VANQWISH, RITA-3, ICTUS, and GUSTO IIb Trials [21,24 ,25 and 27], which might be attributable to poor control of risk factors, patient neglection and poor health education. Our study shows no gender difference regarding age and treatment given which is differ from study conducted by Ruchira et al which show female to be older [28].Our study shows more prevalence of smoking among risk factors followed by hypertension, diabetes mellitus and obesity, while DM and smoking have similar prevalence in a study conducted by ZN Hatmi, [29] ,dyslipideamia (6.5%) and family history of premature coronary artery disease (3.8%) is less prevalent in our study compared to that found by ZN Hatmi.

Most of patients were low –intermediate risk score (TIMI score) as found in TACTICS-TIMI-18[23].

Most patients in our study presented with UA followed by STEMI and NSTEMI in a decreasing order of frequency which differed from one trial to another; in a study conducted by Ferrieres J,

UA/NSTEMI found in 62%while ,STEMI in 38%[30],while in a study conducted by Zubaid et al 34% had STEMI, 27% NSTEMI and 39% UA [31]while in Steg PG et al study STEMI found in 30%, NSTEMI found in 25%, UA in 38% [32].

Medical therapy in our study is close to that recommended by guidelines in particular ACEI,B-blockers and calcium channels blockers, GP2b3a inhibiters used mainly in patients managed invasively, all patients in our study who underwent invasive management receive loading dose of 600mg clopidogrel unlike study conducted in Kuwait where only minority receive it(18%) ,the use of GP2b3aI was minimal 2%,mortality rate was 4%in this study[31], while in UK most frequently used a 300-mg clopidogrel loading dose (70%) compared with France (53%) and Spain (56%), while >300 mg was used in 21%, 34% and 16% patients, respectively[32].

In this study, invasive therapy used in 55 % (in% group A 50%,in group B 60%),which was different from that found in Kuwait by Zubaid et al study (20%)[31], while in a study conducted by Christopher B found invasive modality in 60% in TIMI IIIB trial, 49% in USA, 25% in Canada [27]. Other study conducted by Piegas et al showed a wide range in coronary angiograms ranging from 60% in Brazil

and 58% in the United States to 15% in Hungary and 2% in Poland [33].

There was trend to use invasive therapy in low risk group similar to study conducted by Yan Andrew T et al[34], but majority of invasive therapy applied for intermediate risk group in our study.

Some interventionists preferred to avoid invasive treatment in high risk group with NSTEMI as found Deepak L et al [35] a similar trend found in our study.

International guidelines recommend referral to cardiac catheterization for intermediate and high-risk NSTE ACS patients within the first 48 hours of presentation. Despite these recommend-ations, data from a large nationwide registry show that the majority of high-risk patients with NSTE ACS are not being managed with an early invasive strategy [36].

Surgery (coronary artery bypass graft) used mainly for patients with LMS disease and in patients with 3 vessel disease with LV dysfunction or diabetes mellitus.

Among patients underwent coronary angiogram in our study medical treatment used in patients who were unfit for revascularizations by PCI or by surgery, about half of all (single vessel disease) cases were amenable for revascularization by PCI.

The current study shows no significant difference between conservative arm and invasive one regarding mean duration of admission to hospital which differ from that expected with those managed invasively to have short duration of admission to hospital, this finding may be explained by a more difficult and complicated cases dealt with in the invasive approach, mortality rate in group A was 1.3%, while in group B was 2% which may be related to dealing with more complicated cases. Absence of high risk score in group B may be explained by selection bias or a chance finding.

Reduction in numbers of patients underwent invasive modality of treatment in our study could be explained by large number of patients attending these centers and small number of catheterization units, interventional cardiologist and trained staffs.

Limitations of our study were being retrospective descriptive study unable to deal with cases in a proper way; another potential limitation was lack of the follow up to know fate of patients.

Conclusion

Management of acute coronary syndromes was the same between tertiary cardiac centers and it is progressing significantly in our country.

Recommendation

1- Increase the numbers of cardiac centers, units and staffs dealing with acute coronary syndromes including primary PCI to meet the increasing number of patients suffering from coronary artery disease.

2- Adoption of guidelines for tertiary centers that did not differ from American or European guidelines.

3- Routine use of validated risk score may enhance risk stratification and facilitate more appropriate tailoring of intensive therapies toward high-risk patients.

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