

Coronary angiography in left ventricular dysfunction patients with no clinical evidence of ischemic heart disease

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Abstract

Background : Coronary artery disease is the underlying cause in approximately two thirds of patients with systolic heart failure ;

Coronary artery angiography may be useful to define the presence ,

Anatomical characteristics ,and functional significance of Coronary artery disease in selected heart failure patients with or without signs and symptoms of Coronary artery disease.

Objectives: to verify the clinical usefulness of coronary angiography (CA) in congestive heart failure (CHF) patients with no history of ischemic heart disease and to identify predictive factors for performing coronary angiography to patients with congestive heart failure with no obvious ischemia.

Methods :this is a cross-sectional study conducted Ibn al –Bitar center for cardiac surgery during a period between November 2009 and November 2010 ;all included patients have symptomatic LV dysfunctional with NYHA functional class II or more with no clinical evidence of IHD .History, physical examination had been performed for each patient , in addition ti blood tests ,ECG ,CXR, echocardiography and Coronary angiography

Results :Among 112 patients with symptomatic LV dysfunction of unknown cause enrolled in this study male :female ratio 3:1 their age (17 -77 years)there were 14 patients (12.5%)with significant Coronary artery disease , statistical analysis between CADand non CAD group show :the CAD were more common in male 11 patients (78%) smokers(1)Were female , 25 patients (22.3%) were diabetic , 25 diabetic (22.3%) were hypertensive ,50 diabetic (44.6%) were smokers . 4 diabetic (3.5) with family history of dilated cardiomyopathy

(DCM) and 27 diabetic (23.2%) with hyperlipidemia and 3 diabetic (2.6%)) with family history ischemic heart disease (IHD in close relative at age <50 years in men and <55 years in women) as demographic distribution of patients in table 1 .coronary angiography show that are 14 patients (12.5%) with significant coronary artery disease (CAD) and 98 patients (87.5%) with significant coronary artery disease . as shown in figure 1 . eleven patients (78%) of patients (22%) were female statistical analysis shows that the male is more predominant in CAD groups as shown in table 2 . twelve patients (85.7%) of patients with CAD were smokers while only 38 patients (38.7%) were smokers in non CAD group . statistical analysis shows there is significant difference between the two groups (p value < 0.01) as shown in table 3 .nine patients (64.2%) of patients with CAD were diabetics while 16 patients (16.3%)were diabetics in non CAD group , statistical analysis shows there is significant difference between the two groups (p value < 0.005) as shown in table (3) .there is no statistical between the mean of left ventricular ejection fraction of CAD group (37 ±10 %) and that of non CAD (36±9 %) , p value > 0.5 as shown in table 6 . figure 2 revealed that LAD lesion was most common coronary artery lesion which represent 12 (85%) followed by in order of frequency LCX 42 % ,RCA 28% and LMS 7% ; in addition to that 57% with single vessel disease ,14.2% with 2 vessel disease and 28.4%with r vessel disease (2)Leads , ST depression ≥1 mm or deep T wave inversion had been excluded

Al – Kindy Col Med J 2013; Vol. 9 No. 1 P:133

Introductions

WCG ,CXR complete blood picture and biochemical tests including fasting blood sugar ,renal , liver function test and serum electrolytes also lipid profile ((in form of total serum cholesterol (TSC), serum low density triglyceride (TG))) has been checked in all patients .The normal and abnormal values of echocardiography studies follow American society of echocardiography s Guidelines and standards committee

Coronary angiography and left ventricular (LV) angiography measurement Lv and diastolic pressure (LVEDP) done according

to the standard method , coronary artery stenosis ≥50% of left main stem or ≥70% of main arteries or their major branches consider as significant .

The collected data had been tabulated in term of frequency distribution tables that showed that frequency,that mean and standard deviation of different parameters of heart failure .

Statistical analysis had been done using student `s t-test and chi square test , p value of less than 0.05 had been selected as the level of statistical significance

Result

This study had enrolled 112 patients with history of heart failure of unknown cause their ages had ranged between 17 -77 years

(mean age 47 ± 9 year) , 87 patients (77.6%) were male , 25 patients (22.3%)(3)

Table 1: Demographic data of study group characteristics

Character	No.	%
Total no.	112	100
Sex	Male	77.6
	female	22.3
DM	25	22.3
HT	25	22.3
Smoking	50	44.6
Family of DMC	4	3.5
History of thyroid disease	2	1.7
Hyperlipidemia	26	23.2
Family Hx of CAD	3	2.6

*IHD in close relative at age < 50 years in men and < 55 years in women ,DM : diabetes mellitus , HT : hypertension , DCM : dilated cardiomyopathy , Hx : history , CAD : coronary artery disease .

Table 2

<i>Coronary Artery Disease</i>			
P value	no	yes	Gender
	No.(%)	No(%)	
<0.05	76(77.5%)	11(78%)	Male
>0.1	22(22.5%)	3(22)	Female
>0.1	98(100)%	14(100)	Total

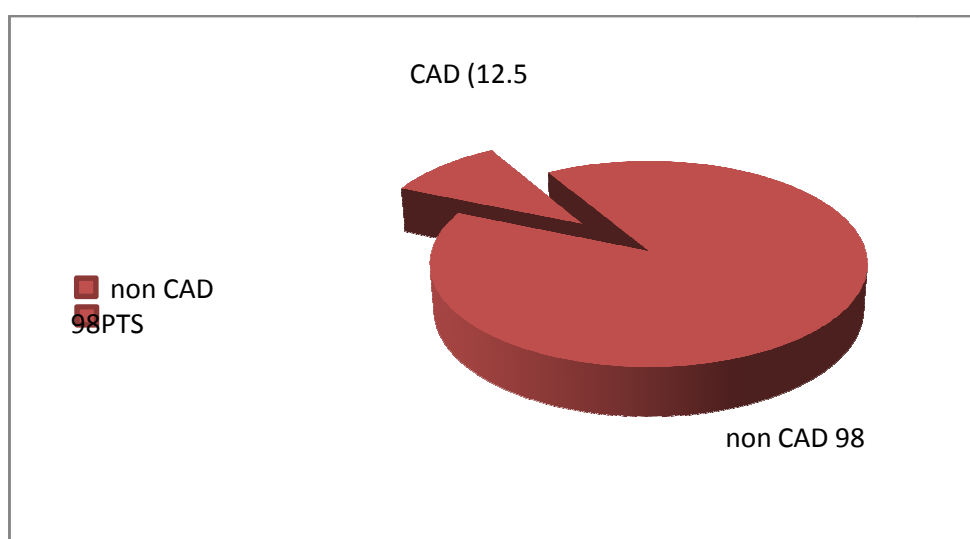
Figure 1 : distribution according to coronary angiography (CA) findings , CAD : coronary artery disease.

Table 3 : distribution of the studied groups according to risk factors

P-value	Coronary artery disease		Risk factor
	No	Yes	
	No.(%)	No.(%)	
<0.01	38(38.7%)	12(85.7%)	Smoking
<0.005	16(16.3%)	9(64.2%)	DM
>0.3	22(22.4%)	3(21.4%)	Hypertension
>0.4	22(22.4%)	4(28.6%)	Hyperlipidemia
>0.9	3(3%)	1(7%)	Family Hx of DCM
>0.4	2(2.04%)	1(7%)	Family Hx of CAD

*One patient may have more than one risk factor ,DM: diabetes mellitus ,DCM : dilated cardiomyopathy , Hx: history ,CAD : coronary artery disease .

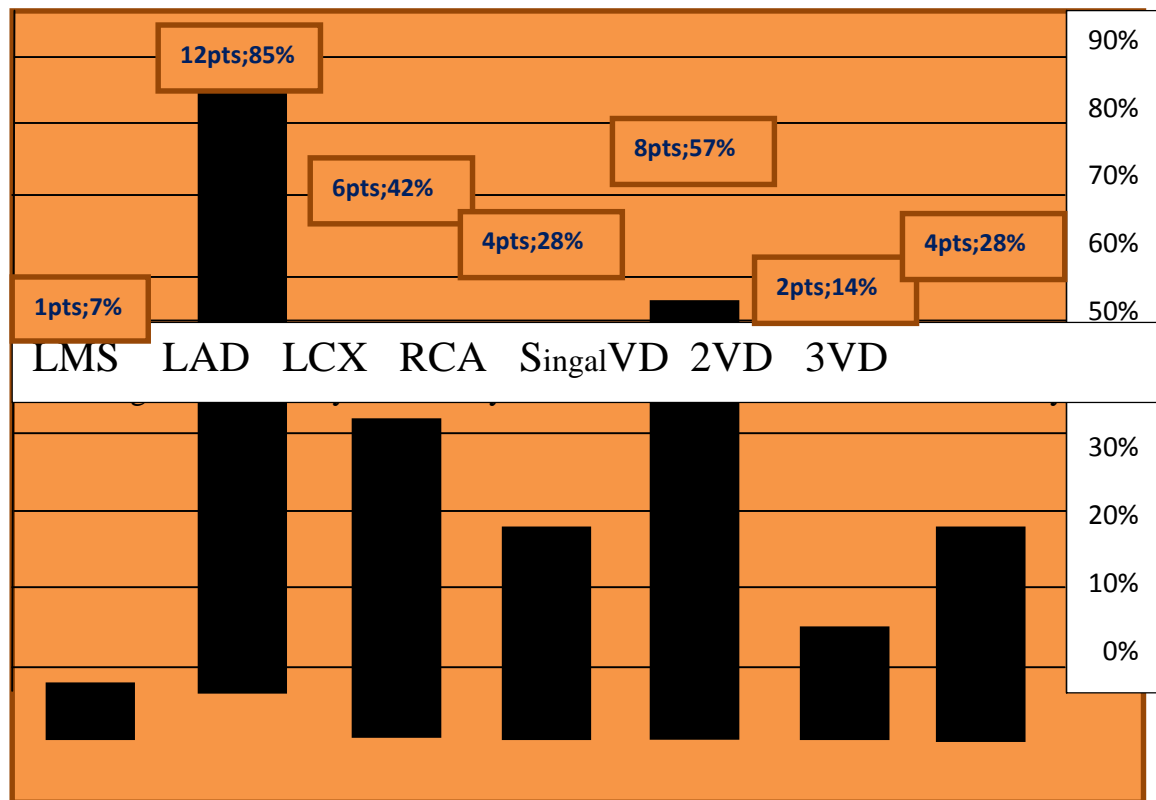
Table 5 Distribution of echocardiography data (RWMA)* according to CA findings**

<i>Coronary Artery Disease</i>			
P value	no	yes	
<0.05	20(20%.4)	8(57.1)	Positive
<0.001	87(79.6)	6(42.9)	Negative
>0.6	98(100)	14(100)	Total

Table 6 : Relation between left ventricular ejection fraction (LVEF)* and coronary angiography findings .

P- value	Coronary artery disease		LVEF%
	No	Yes	
	No.(%)	No.(%)	
>0.05	4(4.08%)	2(14.2%)	50-45
>0.05	54(55.1%)	7(50%)	30-44
>0.05	40(40.8%)	5(35.5%)	<30
>0.05	36 9(24-45)	37 10(22-47)	Mean SD range

*Left ventricular ejection LVEF is measured by echocardiography .



Discussion

As routine coronary angiography in heart failure patients is not cost effective this had stimulated many research workers to study the parameters that indicate ischemic origin in those patients who present with left ventricular dysfunction symptoms with no obvious clinical evidence of ischemic heart disease in order to determine which patient of whom should send for coronary angiography, specially heart failure patients with coronary artery disease are often asymptomatic with regard to ischemic symptoms(4).

However, angina may be missing and dyspnea may be the leading symptom, which is misinterpreted as heart failure symptom rather than an ischemic equivalent(4).

Current study revealed that (12.5%) of total patients have significant coronary artery disease among patients with symptomatic LV dysfunction with no clinical evidence of ischemic heart disease and these results are nearly comparable to the findings of Mortara et al study who revealed that

(17.6%) of patient with heart failure of uncertain etiology with significant CAD(5).

.our results was in disagreement with the findings of Duncan et al study whose results 61% of patients have significant coronary artery disease and the cause of this difference could be explained by in Duncan et al study they exclude only cases of myocardial infarction within three months and cases of unstable angina within one month (6) .

Also the results of current study is slightly lower to results of Ramazan et al study in which 37% of heart failure patients were ischemic in origin (20) Also current study results differ from results of Zoltan et al study in which 75% of heart failure patients with severe MR were ischemic in origin and the cause of this difference is they not exclude myocardial infarction patients (7).

Male is the predominant gender (statistically significant) in CAD group they constitute (78%) and the male gender is also predominant in K. Papadopoulou et al study (90%)(8) this could be expected as CAD is more common in male than female(9).

In CAD group the smokers constitute (85.7%) which is statistically different than smokers in non CAD group (38.7%) and this related to endothelial dysfunction in coronary circulation, while findings are not in agreement with papadopoulou et al study the smokers are not predominant in CAD group (24%) and in non CAD group (30%)(8)

Diabetes Mellitus is more frequent in CAD group in statistically significant value, in current study the diabetics constitute(64.2%) in CAD group and (16.3%) in non CAD group and these results are quite similar to Italian Mortara et al study in which(66.6) were diabetics in CAD group and in non CAD patients diabetics constitute 27.4% and these results attributed to acceleration of atherosclerosis in diabetes mellitus due in part to atherosclerosis small dens particles of LDL(9).

echocardiographic finding of dyskinesia, akinesia or aneurysm were excluded while patients with regional wall motion abnormality(RWMA) in form of hypokinesia involved in the study; the statistical analysis show .

Conclusion

In heart failure patients with no obvious ischemia by history examination,ECG, or echocardiographic findings there is 12.5% percent of coronary artery disease need to be evaluated with coronary artery disease need to be evaluated with coronary angiography ,being male, smoker or diabetic increase the like hood of coronary artery disease in patients presents with heart failure of uncertain etiology and promote us to perform coronary

Angiography ,LAD is the most common artery affected and its involvement alone is enough to cause left ventricular dysfunction, so to clarify the results of this study and confirm these conclusions ,larger studies are recommended to include larger number of patients and continue for longer duration

References

1. cowie MR ,Mosterd A ,Wood DA, et al . The epidemiology of heart failure . Eur j . 1997 ; 18 :208-225.
2. ckeland L ,Erdmann E,Ferrari R. et al . Guidelines for the diagnosis of heart failure . Eur heart j . 1995;16:741 -751
3. Lang RM, Bierig M,Devereux RB,et al : chamber Quantification writing Group ; American Society of Echocardiography `s Guidelines and standards committee ;European Association of Echocardiography :Recommendations for chamber Quantification : A report form the American Society of Echocardiography `s Guidelines and standards committee and the chamber Quantification writing Group ,developed in conjunction with the Eoropean Association of Echocardiography , a branch of the European Society of cardiology. J AM Soc Echocardiogr 2005 ;18 : 1440
4. Otto M.Hess john D .carroll , Braunwald`s Heart Disease ,clinical Association of heart failure, Eighth Edition 2007 ; Philadelphia : Elsevier ;23;p 568,569
5. A.Mortara , p.delfion , et al , Coronary angiography in CHF patients with no history of ischaemic heart disease ,policlinico di monza, cardiology,monza (MI),italy:Eur heart j. Vol 4,Abstr.suppl.August2002.page578
6. Duncan M.,E. Dalamaga, T,Karamitsos, et al, stress long Axis identities ischemia cardiomyopathycirculation 2004;108;1214-1220.
7. Zoitan.A.Szalay,Ali Civelek,Stephen Hohe,Hans-peter Brunner-LaRocca,wolf-peter Klpvkorn,Igor Inez ,paul R. Vogt,Erwin p. Bauer.Mmitral annuloplasty ,in patients with ischemic versus dilated cardiomyopathy;Eur j cardiothorac surg 2003;23:567-572.
8. Kilo papadopoulou , georgos giannakoulas , haralambos krvounis ,emmanouella dalamanga, theodors karamitsos , despina parcharidou, eftthlia damvopoulou ,georios.K efthimiadis, loannis styliadis ,differences in echocardiographic characteristic of functional mitral regurgitation in ischemic versus idiopathic DCM ,Hellenic J Cardiol 2009;50:37-44.
9. Bierman EL atherosclerosis in diabetes.Arterioscler thromb 1992; 12:647-56.
10. Eric H. Awtry, joseph loscalzo,CECIL essential of medicine , coronary heart disease , risk factors sixth edition W.B, saunders company ,ch9 p88.
11. A,Bayes – genis et al / distinct LBBB pateren in ischemic and non ischemic DCM , THE Eur J OF heart failuar 5 (2005) 165-170.

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