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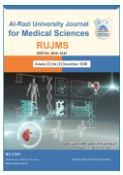

Angiographic Characteristics of Young and Older Yemeni Patients Undergoing Diagnostic Coronary Angiography at Cardiac Center in Al-Thowrah Hospital, Sana' a City-Yemen

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Abstract

Background: *Coronary artery disease accounts for the greatest proportion of CVDs and is one of the most common causes of death in the developed countries.* ***Aim****: to identify the risk factor and angiographic characteristics of CAD among young and older patients presented with IHD.* ***Methods:*** *A total of 555 patients underwent diagnostic coronary angiography were enrolled between January and June 2013. Patient admitted in ward as one-day admission and discharged 6 hours after the procedure. Demographic data, clinical findings, details of electrocardiographic and echocardiographic findings were recorded. The traditional cardiovascular risk factors (smoking, hypertension, Khat chewing, family history and diabetes mellitus, dyslipidemia) were noted. The patient included were patients with stable angina, post-myocardial infarction and pre-operative coronary angiography before valve replacement. A written consent form was signed by the patient-and his or her relatives was obtained before the procedure.* ***Results****: Most of the patients in the study were diagnosed as post MI angina. High percentage of diabetes and hypertension among the older group in comparison to the younger group (P-value <0.05). 50% of the younger group were smokers in comparison to 23.8% in older group with statistically significant difference (P-value =0.000). Family history of IHD was higher in the younger age group than that in the older age group but not significant (P-value = 0.129).. Significant left main disease was more than double in younger group (3.7%) when compared older group (1.9%). about one-third of younger group had significant LAD lesion while small number of older patient had significant LAD lesion (P-value = 0.037). The involvement of RCA was significantly higher in older group than in younger group (P-value=0.001). Although the prevalence of LCX disease was higher in older than younger group (P-value = 0.59). It is found that LAD was commonly involved vessel in the young group (31.5%) in comparison to older group (1.6%) while left circumflex artery and right coronary artery was common in in the older group.* ***Conclusion:*** *Smoking, family history of cardiovascular diseases, and Khat chewing high in the young patients but hypertension and diabetes were high in old patients.*

Keywords: Coronary artery disease**:** angiographic characteristics; ischemic heart disease

Introduction

Coronary artery disease (CAD) accounts for the utmost proportion of CVDs and is the main cause of mortality in the developed countries as well as in developing countries[1,2]. Three-fourths of global deaths due to CAD occurred in the low and middle-income countries [3,4]. The major risk factors for coronary artery disease

include hypertension, cigarette smoking, diabetes mellitus, elevated cholesterol levels, and obesity. The prevalence of important those risk factors varies greatly according to geographical region, sex, age, and ethnic background[5,6,7]. The variation in disease prevalence from region to another is likely a result of many non-traditional risk factors. Some investigators proposed considering khat chewing which is a common habit among Yemenis as a risk factor for CAD as it was associated with a higher mortality rate and complications such as cardiogenic shock, heart failure, recurrent ischemia, and stroke despite a lower prevalence of cardiovascular risk factors, including diabetes mellitus and prior CVD [8-12]. To date, there is no information available on the different aspects of ischemic heart disease in young patients in Yemen. In the present study, we identify risk factors, mode of presentation, treatment and angiographic profile of CAD in younger ischemic heart disease patients.

Aim of the study

To identify the risk factors and angiographic characteristics of CAD among young and older patients presented with ischemic heart disease (IHD).

Subjects and Methods

This study was conducted in the cardiac center in Al-Thowrah Modern General hospital (AMGH). AMGH is the major referral center for cardiovascular diseases and surgeries in Yemen. Patients are referred for diagnostic coronary angiography from different cities as well as from other hospitals. A hospital-based study was conducted from January to June 2013. A total of 555 patients were included in the study. Patients admitted in the ward as one-day admission and discharged 6 hours after the procedure. The patients with stable angina, post-myocardial infarction, and pre-operative coronary angiography before valve replacement were included in the study. Data were e collected through a structured questionnaire which included; demographic data (age, sex, marital status and education), clinical examination, electrocardiography, and echocardiography were documented on catheterization laboratory forms filled by either cardiologist or trained practitioner. The traditional cardiovascular risk factors (smoking, hypertension, Khat chewing, family history, diabetes mellitus, and dyslipidemia) were collected. Coronary angiography was performed through femoral and occasionally through the radial artery. The data was analysis by used SPSS version 18.Percentage, numbers and Mean±SD were applied. Age of patients was divided into two groups (≤ 40 years old as younger group and age > 40 years old as older group). The differences between groups were done using x^2 test (for categorical variables) and independent *t*-test (for the numerical variables). *P*-value <0.05 depicted significant statistical difference. The study was performed with approval from the Ethical Committee of the cardiac center in AMGH. A written informed consent signed by the patients and his or her relatives was obtained before the procedure.

Results

A total of 555 patients underwent diagnostic coronary angiography were enrolled in this study. Age of patients was divided into two groups (≤ 40 years old as younger group and age > 40 years old as the older group).

The older group account for 501 (90.3%) while younger group accounts for 54 patients (9.7%). The majority of patients in both groups were male

(81.5% and 74.5% in younger and older group respectively). The means age of the both study groups was (54.7±10.26). In younger group was (36.8 ± 3.7) years and in older group (56.7±8.7), no statistical differences between groups (p-value = 0.321). Most of the patients in both groups were married (98.1% and 96.0% in younger and older group respectively) with no statistical significant difference. Table 1

Most of the patients (64.8%) in the younger group and 48.1% in the older group were post MI angina (P-value=0.01), while 14.8% of the patents in the younger group and 37.3% in the older group had stable angina (SA) (P-value=0.001). Ejection fraction did not differ significantly in both groups (p-value= 0.566). Table 2.

Table 1: Demographic characteristics of the patients

Demographic Characteristics	**Younger group (Age ≤40 year) n=54**	**Older group (Age >40 year) n =501**	**P-value**
Age (Mean±SD)	36.76±3.7	56.65 ±8.7	0.000
Sex			
• Male	10 (18.5%)	373 (74.5%)	0.321
• Female	44 (81.5%	128 (25.5%)	
Marital status			
• Married	53 (98.1%	480 (95.8%)	0.151
• Unmarried	1(1.9%)	21(4.2%)	
Level of education			
• Educated	41(75.9%)	218 (43.5%	0.000
• Uneducated	13(24.1%)	283(56.5%)	

Table 2: Clinical examination, ECHO, and echocardiography of the patients

Variables	**Younger group (Age ≤40 year) n=54**	**Older group (Age >40 years) n =501**	**P-value**
Indication*			
• Post MI	35 (64.8%)	231 (48.1%)	0.01
• SA	8 (14.8%)	179 (37.3%)	0.001
• Pre-op	9 (16.7%)	65 (13.5%)	0.406
• CM	2 (3.7%)	5 (1.0%)	0.142
ECHO Findings			
Ejection Fraction			0.566
• <50	23 (42.6%)	237 (47.7%)	
• >50	31 (57.4%)	260 (52.3%)	

***MI:** Myocardial Infarction- **SA:** Stable Angina- **Pre-op:** Pre-operative- **CM:** Cardiomyopathy*

Risk factors among the patients

Table 3 shows the distribution of risk factors among patients. The findings of the study showed that 23.8% of the

older group were smokers in comparison to 50% in the younger group, statistically significant difference was found (p-value=0.000). Hypertensive patients were (29.6%) in younger group and (43.1%) in the older group (p-value = 0.06).

The prevalence of diabetes was high in the older age group (24.4%) in comparison to the younger age group (11.1%), there was statistical difference between age group (p-value = 0.027). Dyslipidemia was not a common risk factor among both group with no statistically significant difference between the two groups (26.2% and 22.7% in older and younger group respectively).

The prevalence of family history of IHD was observed to be higher in the younger age group (24.1%) than that in the older age group (16%)(p-value= 0.129). The percentage of Khat chewing did not differ between the two groups (70.4% and 62.5% in younger and older group respectively) (p-value = 0.3).

Table 3: Distribution of the risk factors among the patients

Risk Factors	Younger group (Age ≤ 40 year) n=54	Older group (Age > 40 year) n=501	P-value
Diabetes mellitus	6 (11.1%)	122 (24.4%)	0.027
Hypertension	16 (29.6%)	216 (43.1%)	0.06
Dyslipidemia	10 (22.7%)	100 (26.2%)*	0.692
Smoking	27 (50.0%)	119 (23.8%)	0.000
Khat chewing	38 (70.4%)	313 (62.5%)	0.3
Family History	13(24.1%)	80(16.0%)	0.129

**** Missed data: Patients had a lipid profile done in the older group only 381 patients***

Coronary affection

Our study showed significant Left main coronary artery (LM) was more than double in the younger group (3.7%) when compared to the older group (1.6%). about one-third (31.5%) of patients of younger group had significant left anterior descending artery (LAD) lesion while a small number of the older patient had significant LAD lesion (1.6%) (P-value = 0.037).

The involvement of the right coronary artery (RCA) was significantly higher in the older group than in the younger group (27.7% and 7.5% respectively) with (P = 0.001). Although the prevalence of left circumflex artery (LCX) disease was higher in the older group (28.8% and 16.7% respectively) but statistical significance was not found (P-value= 0.59). It was found that the LAD was commonly involved vessel in the young group (31.5%) in comparison to older group (1.6%) while left circumflex artery and the right coronary artery was common in the older group. Table 4.

Table 4: Distribution of coronary affection among the patients

Coronary affection	Younger group (Age ≤ 40 year) n =54	Older group (Age > 40 year) n =501	P-value
LM			
• Normal	51 (94.4%)	484 (96.6%)	0.418
• Not Significant	1 (1.9%)	7 (1.4%)	0.790
• Significant	2 (3.7%)	8 (1.6%)	0.269
LAD			
• Normal	26 (48.1%)	484 (96.6%)	0.100
• Not Significant	11 (20.4%)	7 (1.4%)	0.530
• Significant	17 (31.5%)	8 (1.6%)	0.037
LCX			
• Normal	37 (68.5%)	283 (56.6%)	0.089
• Not significant	8 (14.8%)	73 (14.6%)	0.962
• Significant	9 (16.7%)	144 (28.8%)	0.059
RCA			
• Normal	37 (68.5%)	277 (55.3%)	0.062
• Not Significant	12 (22.6%)	85 (17.0%)	0.334
• Significant	4 (7.5%)	139 (27.7%)	0.001

Discussion

CAD remains the commonest cause of mortality worldwide[14]. It becomes more frequent in young age people than it was in the past[15]. Many studies showed that younger patients have significant hypercholesterolemia; positive family history[16] as well as the history of smoking in comparison with older patients [17]. In our study, most patients in both groups were male (81.5% and 74.5% in younger and older group respectively). The same incidence was seen in Nadeem et al and Shahid et al [18,19].

Myocardial infarction (MI) was common in this study as most of the patients 64.8% in younger and 48.1% in the older group were post-MI angina, while 14.8% of the patents in the younger and 37.3% in the older group had stable angina (SA). This is very important as the risk recurrent MI and cardiovascular death were the most frequent events as it was seen by some studies[20,21]. As reported data show that smoking is the commonest risk factor encountered in young patients with acute myocardial infarction, it was also common in the young group of our study[22-25]. Family history was dominant in a young group that is in consistency with the data that shows a family history of premature MI has been considered as an independent risk factor for the development of cardiovascular events, particularly in young patients[26-29]. Unsurprisingly diabetes was common among the old group in our study as most studies [30-33]. Hypertension was more prevalent in the older group when compared to younger CHD patients that are nearly the same in a study done by Nesligul et al. The study revealed that HTN prevalence was 47% and 22% in older and younger group patients respectively [(34)]. The prevalence was higher in the older group in Abu Siddique study and showed a ratio of 2:1[33]. Dyslipidemia in the term of high triglyceride, high LDL and low HDL show lower incidence in both groups, which is in correlation with other previous studies [31, 34]. Khat chewing which is a common used habit among Yemenis did not differ in the two

groups, which indicates a higher prevalence of Khat chewing in the Yemeni community and carry a high risk of acute MI[35-36]. The study showed that the left anterior descending artery (LAD) was commonly diseased in the young group (31.5%) which is in consistency with the study done by Nafakhi and shows 41.5% LAD disease in young patients[37] while left circumflex artery and the right coronary artery was common in the older group.

Conclusion

We conclude that, smoking, family history of CVD, and khat chewing were high prevalent in the young patients but hypertension and diabetes were high in older patients. Most of the patients in both groups who scheduled for diagnostic coronary angiography were post-MI that reflects the big defect in the utility of primary PCI in our hospital.

Recommendations

The dominance of smoking that is the most modifiable risk factor in premature CAD in young patients indicate that awareness of smoking must be taken. Establishing primary PCI facilities should be considered as timely managed young patients with AMI have favorable in-hospital prognosis.

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