Angiographic Characteristics of Young Yemeni Patients Undergoing Diagnostic Coronary Angiography: Data from A Major Cardiac Center In Yemen

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Abstract

Background: Coronary artery disease (CAD) accounts for the greatest proportion of CVDs and is one of the most common causes of death in the developed countries. It is one of the main etiologies of disease burden in developing countries. There is increase in the number of patients with coronary artery disease in Yemen. The number of patients undergoing elective diagnostic coronary angiography is increasing among different age groups. This study was aimed to identify and compare the prevalence of the risk factors, clinical presentation, management, and angiographic characteristics of CAD between young patients (age ≤ 40 years) and older patients (age ≥ 40 years) presented with ischemic heart disease (IHD). Methods: A total of 555 patients were were enrolled between January 2013 and June 2013. Patient admitted in ward as one-day admission and discharged 6 hours after the procedure. Demographic data, clinical findings, and 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 sable angina, post myocardial infarction and pre-operative coronary angiography before valve replacement. Results: The older group accounts for 90.3% while younger group accounts for 9.7% of the patients. The majority of patients in both groups were male (81.5% in the young and 74.5% in the older group). Most of the patients in the study were diagnosed as post MI angina. High incidence of diabetes and hypertension among the older group in comparison to the younger group (24.4% diabetes and 43.1% hypertensive Vs. 11.1% diabetes and 29.6% hypertensive). 50% of the younger group were smokers in comparison to 23.8% in older group with statistically significant difference (p=0.0001). Family history of IHD was higher in the younger age group (24.1%) than that in the older age group (16%) (p = 0.129). Dyslipidemia was not common risk factor among both groups. The percentage of Khat chewing did not differ between the two groups (70.4% and 62.5% in younger and older group respectively). Significant left main disease was more than double in younger group (3.7%) when compared older group (1.9%). About one-third (31.5%) of patients of younger group had significant LAD lesion while small number of older patients had significant LAD lesion (1.6%) (p = 0.037). The involvement of right coronary artery (RCA) was significantly higher in older group than in younger group (27.7% and 7.5% respectively; with p = 0.001). Although the incidence of left circumflex artery (LCX) disease was higher in older group (28.8% and 16.7% respectively) it did not reach statistical significance. The left anterior descending artery (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: Coronary angiography is a useful diagnostic and therapeutic tool for CAD. Smoking, male gender as well as family history of cardiovascular diseases showed high prevalence in the in younger patients ≤ 40 years, while hypertension and diabetes were common in the older patients. Khat chewing was highly prevalent among both groups.

I. 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. 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 those important risk factors varies greatly according to geographical region, sex, age and ethnic background. [5-7]. 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 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.

II. Patients and Methods

The cardiac center in Al-Thawra hospital is the major referral center for cardiovascular diseases and surgeries in Yemen. Patients are referred for diagnostic coronary angiography

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from different cities as well as from other hospitals. Personal data, 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 noted. This was a prospective observational study conducted from January 2013 to June 2013. A total of 555 patients were included in the study. Patient admitted in ward as one-day admission and discharged 6 hours after the procedure. The patient included were patients with sable angina, post myocardial infarction and pre-operative coronary angiography before valve replacement. A written informed consent signed by the patients and his or her relatives was obtained before the procedure. The study was performed with approval from the Ethical Committee of the cardiac center in Al-Thawra Modern General Teaching Hospital Coronary angiography was performed through femoral and occasionally through radial artery.

III. Results

In our observational and comparative study, a total of 555 participants underwent diagnostic coronary angiography. We divided them according to age into two groups (≤ 40 years old as younger group and age ≥ 40 years old as older group). The older group was 501 and accounts for 90.3% of the patients while the younger group was 54 and accounts for 9.7%. The majority of patients in both groups were male (81.5% and 74.5% in younger and older group respectively). The mean age of the whole study population was (54.7±10.26). In younger group was (36.8 ± 3.7) years and in older group (56.7±8.7) (p = 0.321). Most of the patients in both groups were married (98.1% and 96.0% in younger and older group respectively) with no statistically significant difference. Most of the patients (64.8%) in the younger group and 48.1% in the older group were post MI angina (P=0.01), while 14.8% of the patents in the younger group and 37.3% in the older group had stable angina (SA) P=0.001. Ejection fraction did not differ significantly in both groups (p= 0.566). Table (1)

Table 1: Baseline characteristics of patients

	Young Group (n =54)	Older Group (n = 501)	p
Mean age	36.76±3.7	56.65±8.7	.001
Male	44 (81.5%)	373 (74.5%)	0.32
Female	10 (18.5%)	128 (25.5%)	
Marital status Married	53 (98.1%)	480 (96.0%)	0.15
Education (Yes)	41 (75.9%)	218 (43.5%)	.001
Indication			
Post MI*	35 (64.8%)	231 (48.1%)	0.01
SA	8 (14.8%)	179 (37.3%)	0.00
Pre-op	9 (16.7%)	65 (13.5%)	0.41
CM	2 (3.7%)	5 (1.0%)	0.14
ECHO Findings			
EF			
<50	**23 (42.6%)**	**237 (47.7%)**	0.57
>50	**31 (57.4%)**	**260 (52.3%)**	

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

23.8% of the older group were smokers in comparison to 50.0% in younger group statistically significant difference (p=0.000). Hypertensive patients were (29.6%) in younger group and (43.1%) in the older group (p = 0.06). The prevalence of diabetes was high in the older age group (24.4%) in comparison to the younger age group (11.1%) (p = 0.027). Dyslipidemia was not 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 incidence 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 = 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 = 0.3) (Table 2).

Table 2: Distribution of risk factors

Younger Group (n = 54)		***Older Group (n = 501)***	***P Value***
DM *	**6 (11.1%)**	**122 (24.4%)**	0.027
HTN	**16 (29.6%)**	**216 (43.1%)**	0.06

Dyslipidemia	**10 (22.7%)**	**100 (26.2%) ¥**	0.692
Smoking	**27 (50.0%)**	**119 (23.8%)**	0.001
Khat chewing	**38 (70.4%)**	**313 (62.5%)**	0.30
FH	**13 (24.1%)**	**80 (16.0%)**	0.129

DM: Diabetes mellitus – HTN: Hypertension – FH: Family History ¥ Missed data: Patients had lipid profile done in older group only 381 patients

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

¥ LM: Left main coronary artery, LAD: Left Anterior Descending Artery – LCX: Left Circumflex Artery – RCA: Right Coronary Artery

Our study showed significant left main disease was more than double in younger group (3.7%) when compared older group (1.9%). about one-third (31.5%) of patients of younger group had significant LAD lesion while small number of older patient had significant LAD lesion (1.6%) (p = 0.037). The involvement of right coronary artery (RCA) was significantly higher in older group than in younger group (27.7% and 7.5% respectively) with P = 0.001.). Although the incidence of left circumflex artery (LCX) disease was higher in older group (28.8% and 16.7% respectively) but did not reach statistical significance (P= 0.59).

It is found that the left anterior descending artery (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 (Table 3).

Table 3: Coronary characteristics in the patients

	Younger Group (%)	**Older Group (%)**	**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			

IV. Discussion

Coronary artery disease (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 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). Same incidence was seen in Nadeem et al and Shahid et al [18,19].

Myocardial infarction 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 young group of our study [22-25]. Family history was dominant in young group that is in consistence with the data that shows family history of premature MI has been considered as an independent risk factor for the development of cardiovascular events, particularly in young patients [2629]. Unsurprisingly diabetes was common among the old group in our study as most studies [30-33].

Hypertension was more prevalent in older group when compared to younger CHD patients that are nearly the same in study done by Nesligul et al. The study revealed that HTN prevalence was 47% and 22% in older and younger group patients respectively [25]. The prevalent was higher in the older group in Abu Siddique study and showed ratio of 2:1 [33].

Dyslipidemia in the term of high triglyceride, high LDL and low HDL shows lower incidence in both groups, which is in correlation with other previous studies [25,31]. Khat chewing which is commonly used habit among Yemenis did not differ in the two groups, which indicates higher prevalence of Khat chewing in Yemeni community and carry a high risk of acute myocardial infarction [34,35].

The study showed that the left anterior descending artery (LAD) was commonly diseased in the young group (31.5%) which is in consistence with the study

done by Nafakhi and shows 41.5% LAD disease in young patents [36] while left circumflex artery and right coronary artery was common in in the older group.

V. Conclusion

In our study, male gender, smoking, and family history of cardiovascular diseases were high in the younger patients
(≤ 40 years). On the other hand, the older patients had more hypertension, and diabetes. Khat chewing was highly prevalent among both groups. Most of the patients in both groups whom scheduled for diagnostic coronary angiography were post MI that reflects the big defect in utility of primary PCI in our hospital.

VI. Recommendation

Dominance of smoking that is the most modifiable risk factor in premature CAD in young patients indicated 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.

VII. References

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