RESEARCH ARTICLE

Gender Specific Coronary Angiographic Findings in Patients with Coronary Artery Disease in the Age Year Group 40 to 60.

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Manuscript Info   *Abstract*

Objective: Gender specific coronary angiographic findings in patients with coronary artery disease in the age year group 40 to 60. The aim was to identify gender differences between both sex regarding risk factors and coronary vessels affected by coronary angiography.

Methods: A study of 100 patients (50 male & 50 female) underwent diagnostic coronary angiography in our catheterization laboratory in cardiovascular department in Benha University hospital from April 2014 to April 2015.

Results: A total of 100 patients with age range 40-60 years old were studied, 50 female patients with mean age (53.72±5.9) and 50 male patients with mean age (50.6±9.77).Females were significantly more obese than males. Males were significantly higher than females in smoking, DM & family history of IHD .The clinical presentation was significantly different in both groups. STEMI & NSTEMI were significantly higher in males than females while atypical chest pain was significantly higher in females than males .There was no significant differences between both groups regarding the number of vessels affected while the LAD was the most frequently affected vessel and the left main was the least.

Conclusion: We documented gender difference in clinical presentation between males & females with no significant difference regarding the number of vessels affected while the LAD was the most frequently affected vessel while the left main was the least in both group.

Introduction:-

Coronary artery disease (CAD) due to atherosclerosis is a major cause of death all over the world and is the most common form of heart diseases. Its incidence is increasing among different populations and by 2020 it is estimated that it will be the major cause of death all over the world. (**Lee G, Dennis A. 2004**)

Coronary angiography remains the "gold standard" for identifying the presence or absence of stenosis in coronary arteries and meanwhile provides reliable information during percutaneous coronary intervention. (**Eugene B, Doughles Z, Peter L, et al .2001**).

Significant sex differences exist between men and women with regard to coronary artery disease. The epidemiological studies show that incidence of coronary artery disease is greater in male than female (**Greenland, P., Reicher-Reiss H et al .1991**).

Aim of the study:-

To identify gender differences between males & females regarding risk factors and coronary affected vessels by coronary angiography.

Patients & methods

The present study 100 patients (50 female and 50 male patients) who underwent diagnostic coronary angiography in our catheterization laboratory in cardiovascular department in Benha University hospital from April 2014 to April

2015. Patients included in the study were in the age group 40-60 years old, diabetic, hypertensive, dyslipidemic, smoker patients and IHD patients either STEMI, NSTEMI, unstable angina or Stable angina and patients with positive family history.
Patients younger than 40 or older than 60 years old were excluded from the study.

Results:-

A total of 100 patients with age range 40- 60 years old were studied, 50 female patients with mean age (53.72±5.9) years old and 50 male patients with mean age (50.6±9.77years).

The distribution of the risk factors amongst our CAD patients is demonstrated in table 1. Surprisingly all the traditional risk factors were different in both sexes. Smoking, DM & family history of IHD were significantly higher in male patients than female patients while obesity was significantly higher in female patients than male patients while there was no significant difference between both groups regarding age, hypertension, dyslipidemia and HCV.

Table 5 shows the clinical presentation of the patients with CAD. The clinical presentation was significantly different between both sexes ($P<0.05$), STEMI & NSTEMI presented more often in the male patients while whereas most of the female patients presented with unstable angina & atypical presentation.

The different coronary artery involvements of the patient population are shown in Table 6. For each of the left main coronary artery, left anterior descending coronary artery, right coronary artery, and left circumflex coronary artery, there was no significant difference regarding the involvement between male and female groups. The left anterior descending coronary artery was the most involved coronary artery and the left main coronary artery was the least involved coronary artery in both groups.

Table 4 illustrates the number of involved coronary arteries. The number of the involved coronary vessels didn't differ significantly between the males and females.

Table 1: Comparative study between male & female group regarding risk factors:

Sex	Male	Female	X^2	P value
Age /y **Mean** ±SD	50.6±9.77	53.72±5.9	t= 1.93	>0.05
DM	35(70.0)	23(46.0)	5.91	<0.05
Hypertension	36(72.0)	27(54.0)	3.48	>0.05
BMI **Mean** ±SD	28.78±1.27	29.34±1.48	t=2.03	<0.05
Smokers	32(64.0)	0(0.0)	^ 44.16	<0.05
Menopause Yes No		40(80.0) 10(20.0)	-	-
Family History	24(48.0)	12(24.0)	6.25	<0.05
HCV	6(12.0)	10(20.0)	1.19	>0.05
Dyslipidemia	25(50.0)	31(62.0)	1.46	>0.05

Table 2: Comparative study between male & female group regarding left ventricular function (EF %) & RSWMA:

Sex	Male	Female	t	P value
EF **Mean** ±SD	56.96±8.74	61.56±6.67	2.96	<0.05
RWMA	29(58.0)	13(26.0)	10.51	<0.05

Table 3: Comparative study between male & female group regarding ECG changes:

Sex	Male	Female	X^2	P value
Normal ECG	12(24.0)	15(30.0)	0.457	>0.05
HR **Mean** ±SD	84.22±11.69	84.02±12.56	t=0.082	>0.05
ST elevation Yes No	 7(14.0) 43(86.0)	 3(6.0) 47(94.0)	 ^ 1.0	>0.05
ST depression Yes No	 6(12.0) 44(88.0)	 6(12.0) 44(88.0)	 0.0	>0.05
QS Yes No	 23(46.0) 27(54.0)	 11(22.0) 39(78.0)	 6.42	 <0.05
T wave inversion Yes No	 28(56.0) 22(44.0)	 26(52.0) 24(48.0)	 0.161	 >0.05

Table 4: Comparative study between male & female group regarding the number of vessels affected:

Sex	Male	Female	X^2	P value
No of vessels One Two Multiple	 24(48.0) 10(20.0) 16(32.0)	 16(32.0) 16(32.0) 18(36.0)	 3.1	 >0.05

Table 5: Comparative study between male & female group regarding the clinical presentation:

Sex	Male	Female	FET	P value
Clinical presentation STEMI NESTEMI Chest pain & atypical presentation	 15(34.1) 1(2.3) 28(63.6)	 6(12.2) 1(2.0) 42(85.7)	 6.57	 <0.05

Table 6: Comparative study between male & female group regarding the frequency of coronary arteries involvement:

Sex	Male	Female	X^2	P value
LM Yes No	 5(10.0) 45(90.0)	 6(12.0) 44(88.0)	 0.102	 >0.05
LAD Yes No	 43(86.0) 7(14.0)	 46(92.0) 4(8.0)	 0.919	>0.05
LCX Yes No	 12(24.0) 38(76.0)	 17(34.0) 33(66.0)	 1.21	>0.05
RCA Yes No	 21(42.0) 29(58.0)	 21(42.0) 29(58.0)	 0.0	>0.05

X^2-value: chi square test.   FET ^: fisher exact test.   P value >0.05: Insignificant   P value <0.05: Significant

Discussion:-

Coronary artery disease (CAD) is a leading cause of death of women and men worldwide. CAD's impact on women traditionally has been underappreciated due to higher rates at younger ages in men. Microvascular coronary disease disproportionately affects women. Women have unique risk factors for CAD, including those related to pregnancy and autoimmune disease. *(Kavita Sharma & Martha Gulati 2013).*

For far too long, many believed that coronary artery disease (CAD) was primarily a "man's disease." With increased awareness of the fact that the leading cause of death in women is CAD, this notion is slowly eroding. CAD is a common cause of death or disability in men and women, but CAD manifests differently in women. *(Mosca, Mochari-Greenberger, et al 2010).*

This study enrolled one hundred patients, fifty male patient and fifty female patient in the age group 40 to 60 years old with ischemic heart disease presented for coronary angiography.

It was designed to assess the difference between male and female groups in this age group in CAD affection of number of vessels by visual assessment and QCA.

In this study there was no difference in age between both groups in contrast to other studies as Saudi-Arabian, Iranian& Iraqi studies. *(Assiri 2011)* ,*(Abbasi, De Leon, et al 2012)*, *(Saeed I.D., Abdulmajeed M.A, 2013)*in those the age was significant difference higher in female group than male group but this may be explained in the current work by choosing an age group limited from 40 to 60 years old.

In this study DM was significantly higher in female group than male group with P value <0.05 which was in agreement with Iranian study*. (Abbasi, De Leon, et al 2012).*

On the other hand it was significantly increased in male group than female group in Saudi-Arabian study *(Assiri 2011)* and was statistically insignificant difference between male & female groups in Iraqi study *(Saeed I.D., Abdulmajeed M.A, 2013).*

In this study there was no significant difference in hypertension between male & female groups while it was significantly higher in female group than male group in Iranian study & Iraqi study *(Abbasi, De Leon, et al 2012)*,*(Saeed I.D., Abdulmajeed M.A, 2013).*However, it was significantly higher in male group than female group in Saudi-Arabian study *(Assiri 2011).*

In this study smoking was significantly increased in male group than female group with P value <0.05 & this finding was in agreement with Saudi-Arabian and Iranian studies *(Assiri 2011)*, *(Abbasi, De Leon, et al 2012).* And this may be explained by socio-cultural environment.

On the other hand smoking was insignificant difference between both groups in Iraqi study.

In this study obesity significantly higher in female group than male group with P value <0.05 in agreement Iranian studies *(Abbasi, De Leon, et al 2012)* while BMI wasn't obtained in the other studies.

In this study family history of IHD was significantly higher in male group than female group with P value <0.05 which was in agreement with Saudi-Arabian study *(Assiri 2011).*

On the other hand family history of IHD was significantly higher in female group than male group in Iranian & Iraqi studies. *(Abbasi, De Leon, et al 2012). (Saeed I.D., Abdulmajeed M.A, 2013).*

In this study there was no significant difference in dyslipidemia between male & female groups which was in agreement with Iraqi study. *(Saeed I.D., Abdulmajeed M.A, 2013).*

On the other hand dyslipidemia was significantly higher in male group than female group in Saudi-Arabian *(Assiri 2011).*However, dyslipidemia was significantly higher in female group than male group in Iranian studies *(Abbasi, De Leon, et al 2012).*

In this study left ventricular function was significantly higher in female group than male group with P value <0.05 in agreement with Saudi-Arabian and Iranian studies *(Assiri 2011), (Abbasi, De Leon, et al 2012).*

In this study RWMA was significantly higher in male group than female group with P value <0.05 which wasn't documented by other studies but it may be explained by higher left ventricular function in females than males & increased incidence of STEMI & NSTMEI in male group than female group.

In this study STEMI & NSTEMI were significantly higher in male group than female group with P value <0.05 which was in agreement with Saudi-Arabian , Iranian & Iraqi studies *(Assiri 2011),(Abbasi, De Leon, et al 2012), (Saeed I.D., Abdulmajeed M.A, 2013).*

On the other hand atypical presentation, recurrent chest pain & dyspnea were significantly higher in female group than male group with P value <0.05 in agreement with Saudi-Arabian, Iranian and Iraqi studies.*(Assiri 2011), (Abbasi, De Leon, et al 2012), (Saeed I.D., Abdulmajeed M.A, 2013).*

The explanation of the previous finding can be that acute coronary syndrome and MI had a higher frequency in male patients, whereas the female patients presented with chronic stable angina unstable angina and atypical presentation more frequently. It means that the presentations of female subjects were less severe than were those of male patients. It can be argued that men may be more prone to severe or acute coronary events than women.

On the other hand, there may be no definite difference between the two sexes but men may seek medical advice late and thus exhibit more severe symptoms. In other words, Egyptian men, traditionally, may not be inclined to complain about their medical problems unless they are severe.

What is more, the false positive results of diagnostic measures such as the exercise tolerance test or cardiac perfusion scan could be to blame for the selection of women with less severe symptoms for coronary angiography. Even when having non-severe symptoms, patients can be candidates for angiographic procedures due to the positive results of their exercise tests or cardiac perfusion scans; both of these diagnostic procedures have false positive results. Since the false positive results of these diagnostic tests is considerably high in women, many female patients undergo coronary artery angiography when their symptoms are not significantly severe. The other possible reason for the less severe presentations of female patients could be sought in their anxiety about developing CAD, which could prompt them to demand coronary angiography. Indubitably, further research is required to shed light on the factors responsible for the differences between men and women in terms of CAD presentations.

In this study there was no significant difference as regard the number of vessels affected between male and female groups and this finding may be explained by the small number of the patients included in the study and the age range 40-60 years old in male and female patients, while in Saudi-Arabian and Iranian studies single vessel disease was significantly higher in female group while two vessel disease and multi-vessel disease were higher in male group than female group. *(Assiri 2011), (Abbasi, De Leon, et al 2012).*

In this study the frequency of coronary arteries involvement in both groups was LAD, RCA, LCX & left main respectively which means there was no gender differences in the preference of coronary vessel atherosclerosis in agreement with the Iranian study *(Abbasi, De Leon, et al 2012).*

In this study the most commonly affected vessel in both groups was the LAD and the least commonly affected one was the left main coronary artery in agreement with the Iranian study *(Abbasi, De Leon, et al 2012).*

Limitations of the study:-
A relatively limited number of patients were included in this study, and this was responsible for some results being statistically non-significant, so it needs to be validated prospectively in larger studies.

Conclusion:-
There is no significant difference between female and male groups regarding the number of vessels affected while the frequency of coronary arteries affection in IHD patients either males or females was the same ,the most frequently affected vessel is the LAD while the least was left main coronary artery in both groups.

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