

Differences in risk factors and clinical presentations between men and women with acute coronary syndrome at Sohag University Hospitals.

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ABSTRACT

Background: Gender differences in risk factors and clinical presentations of patients with acute coronary syndrome (ACS) have been reported in different parts of the world with contradicting results.

AIM: This study aimed to evaluate the gender differences in baseline characteristics & to investigate the presence of gender bias in patients admitted with ACS at Sohag University Hospitals.

Patients & Methods: All the patients underwent the followings:

(1) A detailed history was taken including traditional risk factors (2) Full clinical examination (3) Laboratory investigations: Fasting sugar, lipid profile, cardiac enzymes, blood count. (4) Electrocardiograph & echocardiography.

Results: The current study included equal numbers of both genders with 100 females & 100 males. Females were significantly older than males (58.22 ± 5.99 Vs 53.48 ± 4.16), $p < 0.0001$), more obese (25.64 ± 3.40 Vs 24.26 ± 2.34 , $P = 0.001$), less smokers (8% vs. 44%, respectively, $P < 0.0001$), more diabetic and hypertensives (65% Vs 37% , $p < 0.0001$ and (65% Vs 42% , $p = .001$ respectively)but non significant differences detected regarding dyslipidemia or family history of premature CAD. Atypical symptoms were more pronounced in females (42% vs. 28%, $P < 0.003$), unstable angina was more common in females (72% vs. 50%, $P < 0.001$), while STEMI was more pronounced in males (41% vs. 19%, $P < 0.001$). Furthermore, hemoglobin level was significantly lower in females and higher levels of HDL were observed. Females also had a better LV systolic function. **Conclusion:** gender differences in some risk factors & clinical presentation was documented in ACS patients admitted to Sohag university hospitals.

Keywords: acute coronary syndrome, Gender, risk Factors

Introduction

Coronary Artery Diseases (CAD) was previously called “disease of males”; but later on an increasing orientation of CAD is noticed in women (Thom T, et al, .2006 & Mosca L, et al, 2011). There are considerable variations in the prevalence of different risk factors such as diabetes mellitus, hypertension, positive family history of premature CAD, dyslipidemia, obesity,

and smoking may be due to advanced age of women at the time of presentation. The presenting complaints also vary as atypical symptoms such as atypical chest pain, shoulder pain, dizziness, and dyspnoea are more pronounced in women creating many challenges in diagnosis and make women more susceptible to suboptimal and less aggressive care

(Milner KA, et al 1999, Bedinghos J, et al., 2001 & Jneid H, et al 2001).

Consequently, a higher mortality rate is anticipated after the first attack of ST-elevation myocardial infarction and a higher probability of complications among women that require a gender-specific approach to primary and secondary prevention (Milner KA, et al 1999, Wenger NK et al., 2002 & Park JS, et al., 2010).

Evidence of sex-related disparities in acute coronary syndrome prognosis emerged >30 years ago; however, the mechanisms behind these differences remain unclear among patients with acute coronary syndrome (ACS) (Alexander KP, et al 2008). The presence of all these differences makes it important to have a gender-specific approach for better management of ACS in both genders.

patients and Methods :

Patient selection

This study performed on patients presented to Sohag university hospital coronary care unit with acute coronary syndrome

Inclusion criteria: Patients presented with acute coronary syndromes.

Exclusion Criteria:

Age <18 years.

Pregnancy.

Patients were classified into 2 groups according to gender:

Group1- Female patients with acute coronary syndrome.

Group2- Male patients with acute coronary syndrome.

Demographic data

The collected data include variable demographic data and traditional risk factors for coronary artery disease (diabetes mellitus, hypertension, smoking, obesity, dyslipidemia and positive family history for premature coronary artery disease).

Definitions:-

Diabetic patient:- is one who had a history of previously diagnosed diabetes and/or under drug treatment and/or dietary control or his/her fasting blood sugar of more than or equal to 7.0 mmol/L (126 mg/dl).

Hypertensive patient - is a patient who has a history of high blood pressure diagnosed and/or on medical therapy, dietary control, and/or lifestyle modification, his BP measurements more than 140 mmHg systolic and/or more than 90 mmHg diastolic on at least two separate occasions or the patient underwent antihypertensive therapy.

patient:- is a patient with a history of hyperlipidemia diagnosed and/or under drug treatment or his total cholesterol level more than 5.18 mmol/L (200 mg/dL) or LDL cholesterol exceed 3.37 mmol/L (130 mg/dL).

Current smoker:-is one who still smokes cigarettes or other smoking habits within 30 days of the index hospitalization.

Family history for premature coronary artery disease is considered positive if CAD diagnosed in a first-degree relative before 55 years of age for males and before 65 years for females.

Obesity defined by body mass index greater than 30 kg/m².

Clinical presentation includes data about the presenting complaints & in-hospital diagnosis. Also Results of investigations done as laboratory assessment, resting Electrocardiograph & Echocardiography.

Results

Our study included 200 patients who were admitted to CCU of Sohag University hospitals and we classified them into 2 groups according to their gender; male and female patients.

(1)- Comparison between groups:

(A) - Demographic data :

As regards Age & BMI we found statistically significant differences between females & males as reported that females were older & have higher BMI than males (table 1).

Variable	Females No=100	Males No=100	P-Value
Age in years Mean ± SD	58.22±5.99	53.48±4.16	<0.0001
BMI Mean ±SD	25.64±3.40	24.26±2.34	0.001

Table 1:- Age and BMI according to gender (B)- Presence of risk factors :

In comparison between males and females as regards the present risk factors we found a statistically significant differences between both groups as regard smoking, Diabetes &hypertension as smoking habits were less in females than males (8% versus. 44%, , P 0.001),hypertension was more pronounced in females (65% versus. 42%,, P value less than 0.001)and also more likely to be diabetic while in Dyslipidemia was found in 39% of studied females and was found in 32% of studied males with no significant differences (table2).

Variable	Female patients N=100	Male patients N=100	P-Value
Hypertension	65 (65.00%)	42 (42.00%)	0.001
DM	65 (65.00%)	37 (37.00%)	<0.0001
Dyslipidemia	39 (39.00%)	32 (32.00%)	0.30
Smoking	8 (8.00%)	44 (44.00%)	<0.0001

Table 2:- Risk factors according to gender

(c) Family and Past history :

In comparison between male & female as regards the presence of family and past history of CAD we found no statistically significant differences between both groups (table 3)

Variable	Female patients N=100	Male patients N=100	P Value
Family Hx of premature CAD	6 (6.00%)	11 (11.00%)	0.21
Previous AMI	18 (18.00%)	14 (14.00%)	0.44
Previous PCI	18 (18.00%)	12 (12.00%)	0.24
Previous CABG	2 (2.00%)	3 (3.00%)	0.66

Table 3:- Family and past history according to gender (D)- Presenting symptoms:

Table 4 displays variable clinical diagnoses the patients presented with atypical symptoms like dyspnoea or complaints other than traditional typical anginal pain) were more pronounced in females, (42% vs. 28%, respectively, $P < 0.003$).

Variable	Female patients No=100	Male patients No=100	P Value
Typical (anginal pain)	58(58%)	72(72%)	NS
Atypical presentation	42(42%)	28(28%)	<.0003

Table 4:- the Presenting symptoms

(E)- The presenting diagnosis:

In comparison between males and females groups as regard the presenting diagnosis we found that unstable angina was more pronounced in females (72%) versus.(50%) in males with $P < 0.001$ while STEMI occurred more in males(41%) versus(19%), for females with $P < 0.001$

Variable	Female patients No=100	Male patients No=100	P Value
STEMI	19 (19%)	41(41%)	<0.001
NSTEMI	8 (8%)	9 (9%)	NS
Unstable angina	72 (72%)	50 (50%)	<0.001

Table 5:- the presenting diagnosis (F) The patient's Investigations

Table 6 displays the investigations done for patients of both genders where hemoglobin level was significantly lower in females than males (12.8 ± 2.2 for females versus 14.6 ± 2.3 g/dl for males with P value less than 0.001).Also, the level of HDL cholesterol was found to be significantly more in females (1.1 ± 0.4 for females versus 0.98 ± 0.38 mmol/l for males with P value is less than 0.008).

The data of echocardiography assessment for all patients revealed that female patients had a better systolic function where ejection fraction was higher in females (50.8 ± 13.8) than. 45.8 ± 14.2 than males with a significant P value of less than 0.003)

	Female patients No=100	Male patients No=100		P Value
Lab.tests	Value (mean \pm SD)	Value (mean \pm SD)	Reference range	
Hemoglobin (g/L)	12.8 ± 2.2	14.6 ± 2.3	12–16	<0.001
Fasting sugar (mmol/l)	8.3 ± 4.4	9.9 ± 4.8	3.90–6.0	NS
LDL (mmol/l)	2.7 ± 1.2	4.3 ± 1.2	<3.38	NS
HDL (mmol/l)	1.1 ± 0.4	0.98 ± 0.38	>0.91	<0.008
Triglyceride (mmol/l)	1.6 ± 1	1.6 ± 1	0.11–2.15	NS
Echocardiography				
Ejection fraction	50.8 ± 13	45.7 ± 14.2		<0.003
LV diastolic dysfunction	32 (32%)	29 (29%)		NS
Valvular abnormalities	49(49%)	50(50%)		NS

Table 6: The Performed investigations

Discussion:

Our study included 200 patients who were admitted in CCU of Sohag University hospital or those who were in cardiology outpatient clinic, the findings that female patients with ACS found to be older than male patients were displayed in previous studies (Dey et al., 2009; El-Menyar et al., 2009). a finding that is proportionate with the current study; this is mostly to be due to age-related decrease in the level of female hormones that have protective effects.

The present study shows analogous distribution of some of the risk factors for CAD in females and males as regard dyslipidemia, family history of

premature CAD & previous CAD events but different in diabetes mellitus and hypertension that were significantly found more in females than males. Also, History of smoking was less in females with significant values and this is Compatible with our socio-cultural environment. These findings are somewhat different from data reported in (McSweeney et al., 2003). these contradicting results may be caused by different sample size being smaller in this study and also may be due to different geographic locations.

Our findings coincide with the findings registered in Gulf RACE (El-Menyar et al., 2009) concerning the pattern of risk factors for CAD between both sexes; where the prevalence of hypertension and diabetes found to be higher in females with ACS. This similarity may be due to the geographic location.

In the current study, the common presentation for Female patients were atypical complaints rather than traditional typical chest pain and with unstable angina being more common in females unlike STEMI that reported to be common in males. this pattern of variable presentation of Acute coronary syndrome according to gender was found also in other studies (Dey et al., 2009; El-Menyar et al., 2009; Akhter et al., 2009). (Conlan et al., 1993; & Cucuianu et al., 1993) previously explained differences in the activity of thrombosis and fibrinolysis between males and females and consequently different patterns of acute coronary syndromes.

In the current study, we reported that females have lower hemoglobin level than males with significant P value. this finding was found to carry adverse short term in-hospital sequelae (Sabatine et al., 2005; Zeidman et al., 2004). This finding of Low female hemoglobin may be due to

gynecological factors and menstrual blood loss. High-density lipoprotein cholesterol level found to be significantly higher in females than males that will be reflected on clinical outcomes.

Another observation in the current study that female patients had a better LV systolic function as expressed by LV ejection fraction (LVEF) that found to be higher in females. This finding may be attributed to less severe disease in females as also males are commonly presented with ST-elevation myocardial infarction. These findings simulate those reported in a previous study (Anand et al., 2005).

Conclusion:

Data in the current study support the concept that a sex-related variability is found concerning some demographic factors, clinical findings, and presenting diagnoses. Consequently, Physicians and public awareness program should be applied for appropriate unbiased assessment and optimum care and treatment.

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