Table (1): Distribution of the different clinical types of acute coronary syndromes according to sex.

Type of ACS	Men (no=76) No (%)	Women (no=60) No (%)	P. value.
STEMI	47 (61.9%)	26 (43.3%)	0.03
NSTEACS	29 (38.1%)	34 (56.7%)	0.03
UA	20 (26.3%)	28 (46.7%)	0.04
NSTEMI	9 (11.8%)	6 (10%)	NS
Total	76 (100%)	60 (100%)	

UA= Unstable Angina

NSTEMI = Non ST-Elevation Myocardial Infarction

ACS = Acute Coronary Syndromes.

STEMI= ST-Elevation Myocardial Infarction

NSTEACS= Non ST- Elevation Acute Coronary Syndromes.

Out of 76 male patients 47 (61.9%) presented with STEMI, 9 (11.8%) patient presented with NSTEMI, and 20 (26.3%) presented with UA. Out of 60 female patient, 26 (43.3%) presented with STEMI, 28 (46.7%) presented with UA, and 6 (10%) presented with NSTEMI. Significantly fewer women than men presented with STEMI (P =0.03), in contrast, significantly fewer men than women presented with UA (P=0.04). no significant difference between men and women as regard incdence of NSTEMI.

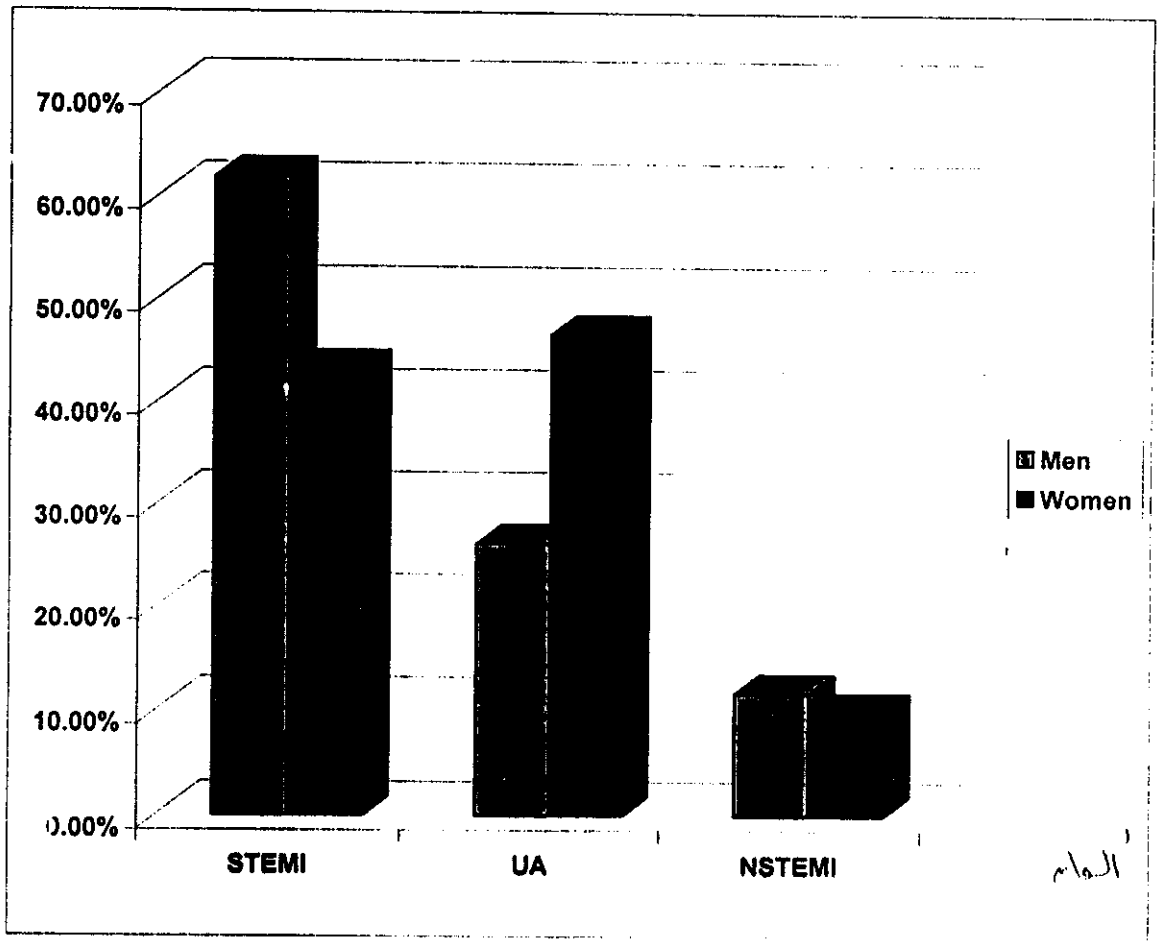

Fig. (1): Distribution of the different clinical types of acute coronary syndromes according to sex.

Baseline clinical characteristics of the patients

Table (2): Baseline clinical characteristics of patients with STEMI.

Variables	*Men (no =47)*	*Women (no=26)*	*P. value.*
Age, (Mean ± SD) in years	53 ± 12.5	62.1 ± 13.2	0.006
Diabetes Mellitus	11 (23.4%)	9 (34.6%)	NS
Hypertension	10 (21.3%)	11 (42.3%)	0.05
Smoking	32 (68.1%)	0 (0%)	< 0.0001
Total. Cholesterol (Mean ± SD)	220.4 ± 52.9	249.7 ± 27.7	0.01
Family History	3 (6.4%)	2 (7.7%)	NS
Prior angina	13 (27.6%)	14 (53.8%)	0.02
Prior MI	3 (6.4 %)	0 (0%)	NS
PVD	2 (4.3%)	2 (7.7%)	NS
CVD	2 (4.3%)	3 (11.5%)	NS

- **MI = Myocardial Infarction.**
- **PVD= Peripheral vascular disease.**
- **CVD = cerebro- vascular disease.**

Women were older, more likely to have a history of hypertension, prior angina and had higher mean total serum cholesterol than men. Non of the women was smoker, in contrast to 32 (68.1%) men patients. No significant differences was observed as regard history of DM, peripheral vascular disease (PVD) and cerebro-vascular disease (CVD). Non of the women had a history of prior MI. while 3 male patients (6.4%) had such history. Non of the included patients had history of prior coronary revascularization (PTCA or CABG).

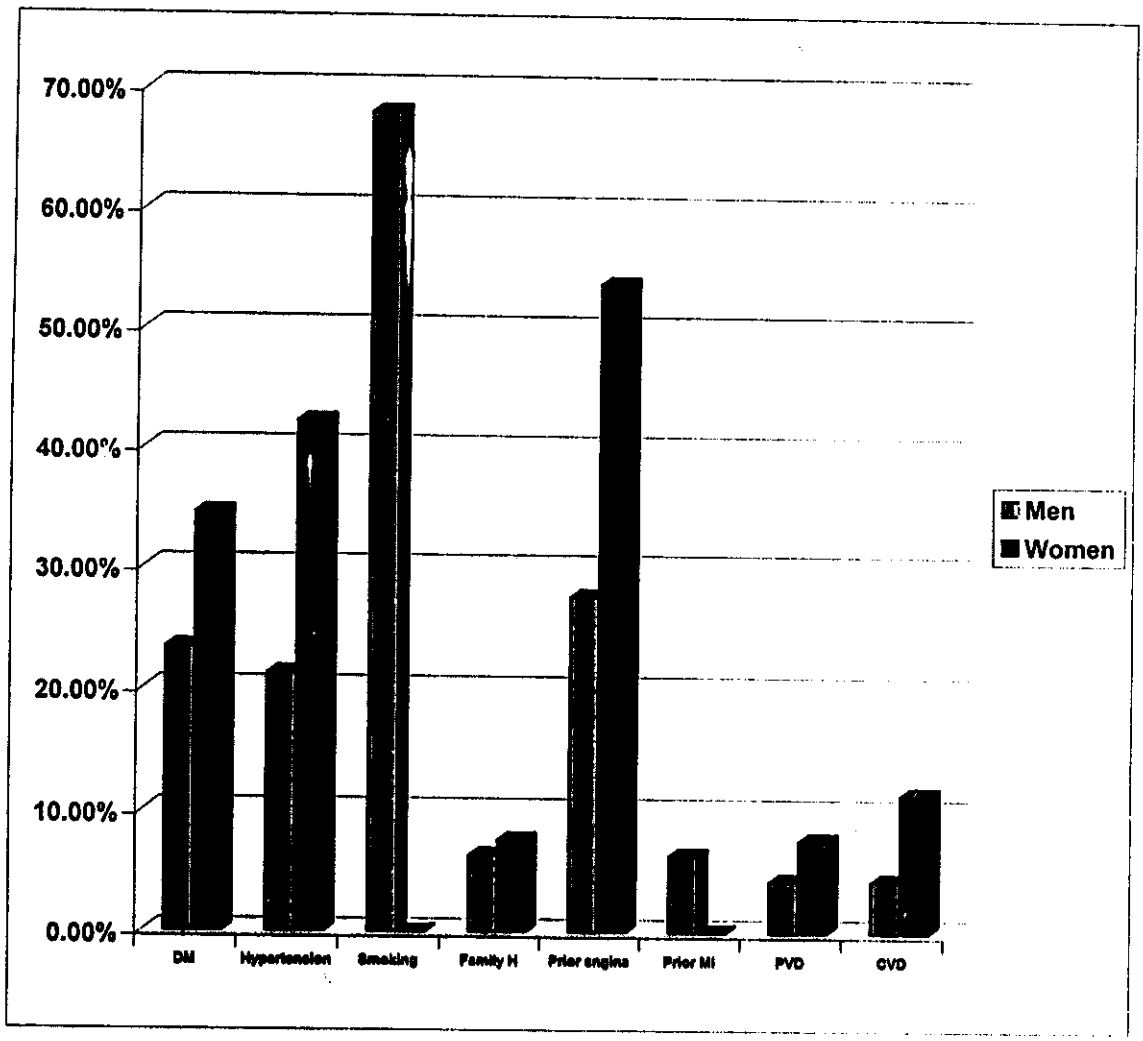

Fig. (2): Base line clinical characteristics of patients with STEMI.

Table (3) : Intial presentation of patients with STEMI

Variables	Men (no =47)	Women (no=26)	P. value.
- Hours to treatment (M±SD)	6.6 ± 6.8	11.8 ± 10.1	0.01
- Syst Blood pressure (M±SD)	112 ± 28	106 ± 24	NS
- Heart rate (Mean ±SD)	82 ± 28	81 ± 31	NS
- Cardiac arrest (VF,VT)	4 (8.5%)	0 (0%)	NS
Advanced A-V Block .	1 (2.1%)	4 (15.4%)	0.03
Killip class			
I	33 (70.2%)	13 (50%)	
II	11 (23.4%)	10 (38.4%)	
III	1 (2.1%)	1 (3.9%)	NS
IV	2 (4.3%)	2 (7.7%)	
Heart failure (all grades)	14 (29.8%)	13(50%)	0.08

VF =Ventricular Fibrillation VT =Ventricular Tachycardia

- **Time between onset of symptoms and presentation (In hours):**
- there is a significant delay in presentation in women than in men.
- **Hemodynamics at presentation:**
- Women presented with similar mean heart rate and mean systolic blood pressure as men.
- No statistically significant difference was observed as regard killip class at presentation. Ther was a non significant trend toward higher incidence of heart failure in women than in men.
- **Major cardiac arrlythmias :**

cardiac arrest (VF, VT). Non of the women with STEMI presented with Cardiac arrest , this is in contrast to 4 (8.5%) men patients.

Advanced AV block (Mobitz type II & complete AV block) significantly more women than men presented with advanced A.V block.

Table (4): Distribution of the site of Myocardial infarction according to sex

Location of infarction	Men (no =47) No (%)	Women (no=26) No (%)	P. value.
Anterior MI	31 (65.9%)	12 (46.1%)	0.09
Inferior MI	7 (14.9%)	7 (26.9%)	NS
Infero Right MI	1 (2.2%)	2 (7.7%)	NS
Infero posterior MI	3 (6.3%)	1 (3.9%)	NS
Infero. Lateral MI	2 (4.4%)	1 (3.9%)	NS
Infero. Right, Posterior MI	3 (6.3%)	3 (11.5%)	NS

- There was non significant trend toward a higher incidence of anterior MI in men than in women (65.9% vs 46.1%, P =0.09), other wise no significant difference was found between men and women with STEMI as regard the other locations of MI.

Table (5): Echocardiographic changes in patients with STEMI.

Variables	Men (no =44)	Women (no=20)	P. value.
EF (mean ± SD)	54 ± 9	47 ± 8	0.007
Diastolic. Dysfunction.	30 (68.2%)	17 (85%)	NS
LV anenysm	4 (9.1%)	1 (5%)	NS
LV thrombus	4 (9.1%)	1 (5%)	NS
Acute sever MR	1 (2.3%)	2 (10%)	NS
Wall motion abnormality	37(84.1%)	18(90%)	NS

LV = Left ventricle ***MR = mitral regurge***

- Ecchocardiography was done in 44 (93.6%) men and 20 (77%) women as some patients died before echocardiography could be done. Women had statistically significant lower mean ejection fraction than men. No significant difference was found as regard other parameters (acute severe MR, diastolic dysfunction, presence of wall motion abnormality, LV aneurysm, and LV thrombus.

Table (6): In-hospital complications in patients with STEMI

In-hospital complications	Men (no=47)	Women (no=26)	P. value.
Worst killip class			
I	32 (68.1%)	9 (34.6%)	
II	8 (17%)	9 (34.6%)	0.04
III	4 (8.5%)	3 (11.5%)	
IV	3 (6.4%)	5 (19.2%)	
Heart failure (all grades)	15 (31.9%)	17 (65.3%)	0.005
Sustained hypotension	11 (23.4%)	7 (26.9%)	NS
Acute severe mitral regurge	1 (2.1%)	2 (7.7%)	NS
Recurrent ischemia	17 (36.2%)	11 (42.3%)	NS
(Re) infarction	2 (4.3%)	2 (7.7%)	NS
Stroke (Non hemorrhagic)	1 (2.1%)	1 (3.8%)	NS
Bleeding (mild to moderating)	7 (14.9%)	7 (26.9%)	NS
VF (Secondary, late)	9 (19.2%)	4 (15.4%)	NS
Ventricular Tachycardial	4 (8.5%)	2 (7.7%)	NS
Atrial Fibrillation / Flutter	3 (6.4%)	4 (15.4%)	NS
Advanced A.V. block	2 (4.3%)	1 (3.8%)	NS

- Among the complications that occurred during hospitalization, heart failure (killip ≥ II) was one of the most common complications in both men and women. However, women were in higher killip classes than men and they had significantly higher incidence of heart failure.

- No statistically significant difference was found between men and women as regard other complications.

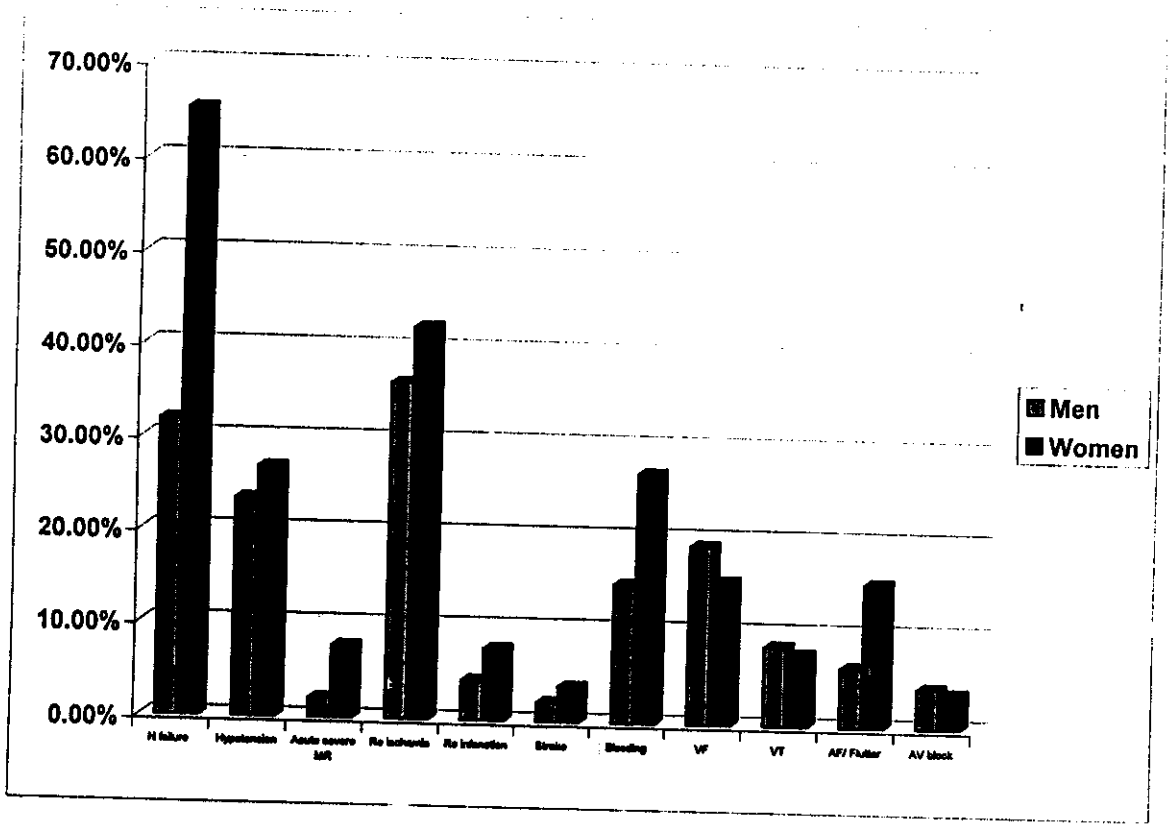

Fig. (3): In- hospital complications in patients with STEMI.

Table (7): Medical treatment including Thrombolytic therapy in patients with STEMI

Variables	Men (no=47) No.(%)	Women (no=26) No (%)	P. value.
Received Streptokinase	29 (61.7%)	13 (50%)	NS
Not eligible for thrombolysis	18 (38.3%)	13 (50%)	
Late presentation	12 (25.5%)	9 (34.6%)	
Contraindication	5 (10.7%)	3 (11.5%)	NS
Equivocal ECG	1 (2.1%)	1 (3.9%)	
Bleeding (mild to moderate) after thrombolysis	4 (8.5%)	4 (15.4%)	NS
Clinical success of thrombolysis	17 (36.2%)	7 (26.9%)	NS
Aspirin therapy	42 (89%)	23 (88%)	NS
B- blocker therapy	28 (60%)	9 (35%)	0.005
ACE inhibitors therapy	30 (64%)	10 (38.5%)	0.006

- No statistically significant difference was observed as regard frequency of administration of thrombolytic therapy (Streptokinase), clinical evidence of reperfusion (rapidly improving chest pain and regression of ST- segment elevation), bleeding complications ,and causes of ineligibility.
- Late presentation was the most common cause of ineligibility to thrombolytic therapy in both men and women.
- Women were less likely to receive B- Blockers and ACE inhibitors than men, however no difference was observed as regard aspirin therapy.

Table (8): Use of temporary and permanent pacing in patients with STEMI.

Variables	Men (no =47) No (%)	Women (no=26) No (%)	P. value.
Advanced AV block	3 (6.4%)	5 (19.2%)	NS
Temporary pacing	3 (6.4%)	4 (15.4%)	
Permanent pacing	0 (0%)	2 (7.7%)	0.1

There was a non significant trend toward a higher incidence of advanced A-V block as well as pacemaker implantation in women than in men .

Table (9) : Base line clinical Characteristics of patients with NSTEACS.

Variables	*Men (no = 29)*	*Women (no = 34)*	*P. value.*
Age (Mean ± SD)	54.3 ± 10.6	57.6 ±8.1	NS
Diabetes Mellitus	13 (44.8%)	21 (61.7%)	NS
Hypertension	14 (48.2%)	30 (88.2%)	0.0006
Smoking	21 (72.4%)	0 (0%)	< 0.0001
Total Cholesterol. (Mean ± SD)	236.6 ± 61.2	252.6 ± 22.8	NS
Family History	3 (10.3%)	2 (5.9%)	NS
Prior Angina	17 (58.6%)	18 (52.9%)	NS
Prior MI	13 (44.8%)	8 (23.5%)	0.07
PVD	1 (3.5%)	2 (5.8%)	NS
CVD	5 (17.2%)	4 (11.7%)	NS
Prior PTCA	4 (13.8%)	0 (0%)	0.02
Prior CABG	6 (20.7%)	0 (0%)	0.005

- **MI = Myocardial Infarction.**
- **PVD= Peripheral vascular disease.**
- **CVD = Cerebro- vascular disease.**
- **PTCA= Percutaneous Transluminal Coronary ngioplasty.**
- **CABG = Coronary Artery Bypass Grafting**

Women were more likely to have a history of hypertension. They were less likely to have a history of prior MI. Non of the women was smoker, in contrast to 20 (72.4%) men patients. No significant difference was observed between men and women as regard mean total serum cholesterol, history of DM, prior angina, family history of CAD, PVD and CVD. Non of the women had a history of prior coronary revascularization (PTCA or CABG) in contrary to 10 (34.5%) men patients who had a history of prior coronary revascularization.

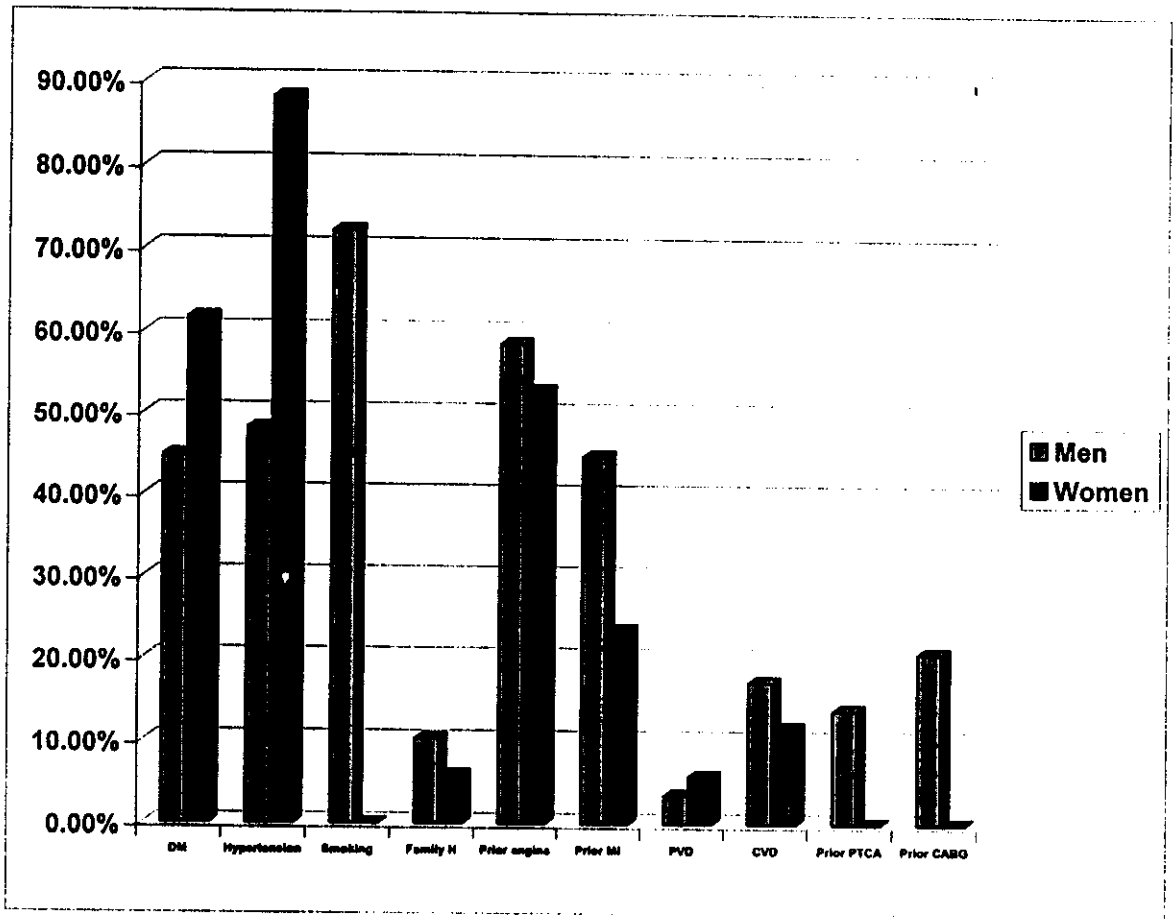

Fig. (4): Base line clinical Characteristics of patients with NSTEACS.

clinical data

Table(10): Initial presentation of patients with NSTEACS

Variables	*Men (no = 29)*	*Women (no = 34)*	*P. value.*
Hours to treatment (M±SD)	5.7 ± 5.4	13.4 ± 11.3	0.001
Systolic Bl. pressure (M±SD)	113 ± 27	131 ± 33	0.02
Heart rate (M±SD)	82 ± 17	81 ± 14	NS
Killip class			
I	26 (89.6%)	28 (82.4%)	
II	2 (6.9%)	3 (8.8%)	
III	0 (0%)	1 (2.9%)	NS
IV	1 (3.5%)	2 (5.9%)	
Heart failure (all grades)	3 (10.4%)	6(17.6%)	NS

- ***Time between onset of symptoms and presentation.***

  Like those with STEMI, women with NSTEACS presented also more late than men.

- **Hemodynamics at presentation:** unlike those with STEMI, women with NSTEACS had significantly higher mean systolic blood pressure than men. There was no significant difference as regard mean heart rate, killip class at presentation, and incidence of heart failure at presentation.

- Non of these patients presented with major cardiac arrhythmia.

Table (11):Differences between women with STEMI and those with NSTEACS at initial presentation

	STEMI (women) (no = 26)	*NSTEACS (women) (no = 34)*	*P. value.*
Hours to treatment (Mean ± SD)	11.8 ± 10.1	13.4 ± 11.3	NS
Systolic Bl. pressure (Mean ± SD)	106 ± 24	130 ± 33	0.003
Heart rate (Mean ± SD)	81 ± 31	81 ± 14	NS
Killip class on presentation			
I	13 (50%)	28 (82.4%)	
II	10 (38.4%)	3 (8.8 %)	
III	1 (3.9%)	1 (2.9%)	0.03
IV	2 (7.7%)	2 (5.9%)	
Advanced A.V block	4 (15.4%)	0 (0%)	0.04

- Women with STEMI were at higher killip classes than those with NSTEACS. They had significantly lower mean systolic blood pressure and higher incidence of advanced AV block.

Table (12): In-hospital complications in patients with NSTEACS.

In-hospital complication	Men (no = 29) No (%)	Women (no = 34) No (%)	P. value.
Worst Killip class			
I	23 (79.3%)	27 (79.4%)	
II	1 (3.5%)	3 (8.8%)	NS
III	1 (3.5%)	1 (2.9%)	
IV	4 (13.8%)	3 (8.8%)	
Heart failure (all grades)	6 (20.7%)	7 (20.6%)	NS
Sustained hypotension	6 (20.7%)	4 (11.8%)	NS
Recurrent ischemia	14 (48.3%)	18 (52.9%)	NS
(Re) infarction	0 (0%)	1 (2.9%)	NS
Ventricular Tachycardia	2 (6.9%)	1 (2.9%)	NS
Ventricular Fibrillation.	2 (6.9%)	2 (5.8%)	NS
AF/ Flutter	1 (3.4%)	2 (5.8%)	NS
Bleeding (Mild to moderate)	2 (6.9%)	6 (17.6%)	NS

- There was no significant gender difference as regard in hospital complications in patients with NSTEACS. Men and women with NSTEACS had similar incidence of heart failure (killip ≥ II), recurrent ischemia , reinfarction, electrical instability and bleeding complications.

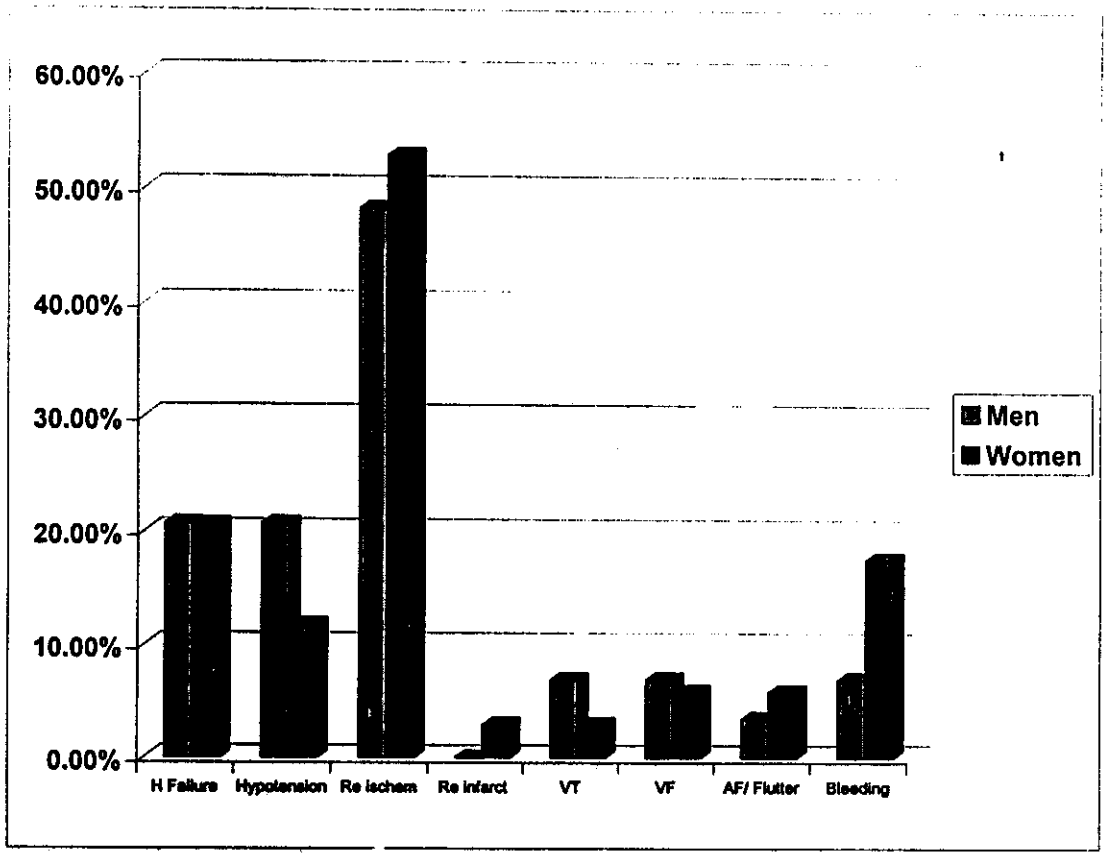

Fig. (5): In- hospital complications in patients with NSTEACS.

Table (13): Differences in-hospital complications between women with STEMI and those with NSTEACS

	STEMI (women) no = 26	NSTEACS (women) no = 34	P. value.
Killip class			
I	9 (34.6%)	27 (79.4%)	
II	9 (34.6)	3 (8.8%)	0.005
III	3 (11.5%)	1 (2.9%)	
IV	5 (19.2%)	3 (8.8 %)	
Sustained hypotension	7 (26.9%)	4 (11.8 %)	NS
Mechanical complications	2 (7.7%)	0 (0%)	NS
Recurrent ischemia	11 (42.3%)	18 (52.9%)	NS
(Re) infarction	2 (7.7%)	1 (2.9%)	NS
Bleeding (mild to mode-rate)	7 (26.9%)	6 (17.6%)	NS
VF	4 (15.4%)	2 (5.8%)	NS
VT	2 (7.7%)	0 (0%)	NS
AF/ flutter	4 (15.4%)	2 (5.8%)	NS
Ejection Fraction (mean ± SD)	47 ± 8	57 ± 7	< .0001

VF = ventricular fibrillation VT = ventricular tachycardia

- Women with STEMI were in higher killip classes than those with NSTEACS. Also they had significantly lower mean ejection fraction (EF 47 ±8 VS 57 ± 7, P.<.0001)
- Other wise, no statistically significant difference was found between both groups as regard other in hospital complications.

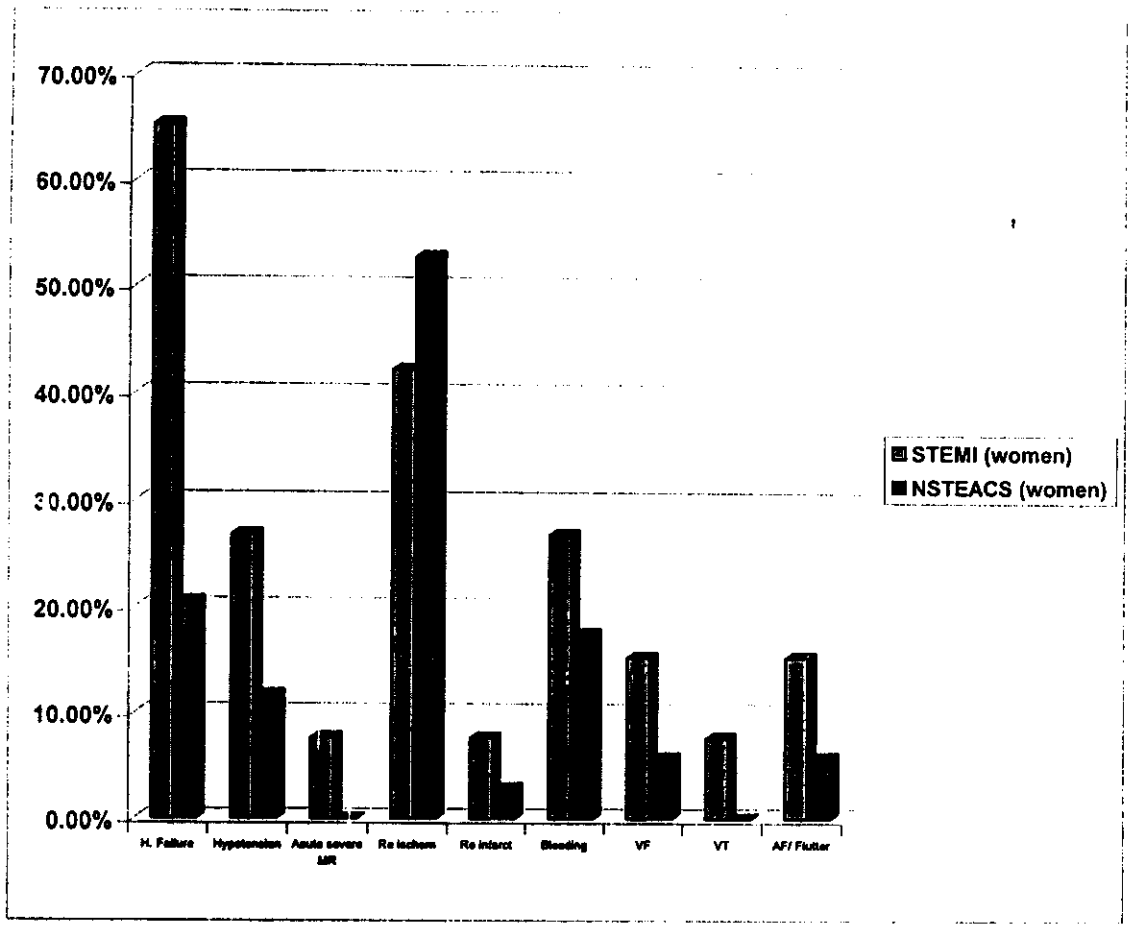

Fig. (6): Differences in- hospital complications between women with STEMI and those with NSTEACS.

Table (14) :**Echocardiographic changes in patients with NSTEACS**

Variables	*Men (no = 29)*	*Women (no = 33)*	*P. value.*
EF (mean ± SD)	56 ± 9.1	57 ± 7.6	NS
Diastolic dysfunction	20 (68.9%)	23 (69.7%)	NS
LV aneurysm	2 (6.9%)	0 (0%)	NS
Wall motion abnormality	23 (79.3%)	20 (60.6%)	NS

LV = left ventricle

Ecchocardiography was done in all men and 33 (97%) women patients.

- No significant difference was observed as regard mean EF, diastolic dysfunction, LV aneurysm and the presence or absence of wall motion abnormality (WMA).

Table (15): **In- hospital mortality rates in patients with acute coronary syndromes.**

Variable	Men No (%)	Women No (%)	P. value.
STEMI	10 (21.3%)	12 (46.2%)	0.02
NSTEACS	4 (13.8%)	2 (5.9 %)	NS
P. value	N.S	0.0003	

Women with STEMI had higher unadjusted in hospital mortality than men. As regard NSTEACS, there was no significant difference in hospital mortality rate between men and women. Women with STEMI had significantly higher in hospital mortality than those with NSTEACS in contrast, no difference was observed in mortality between men with STEMI and those with NSTEACS

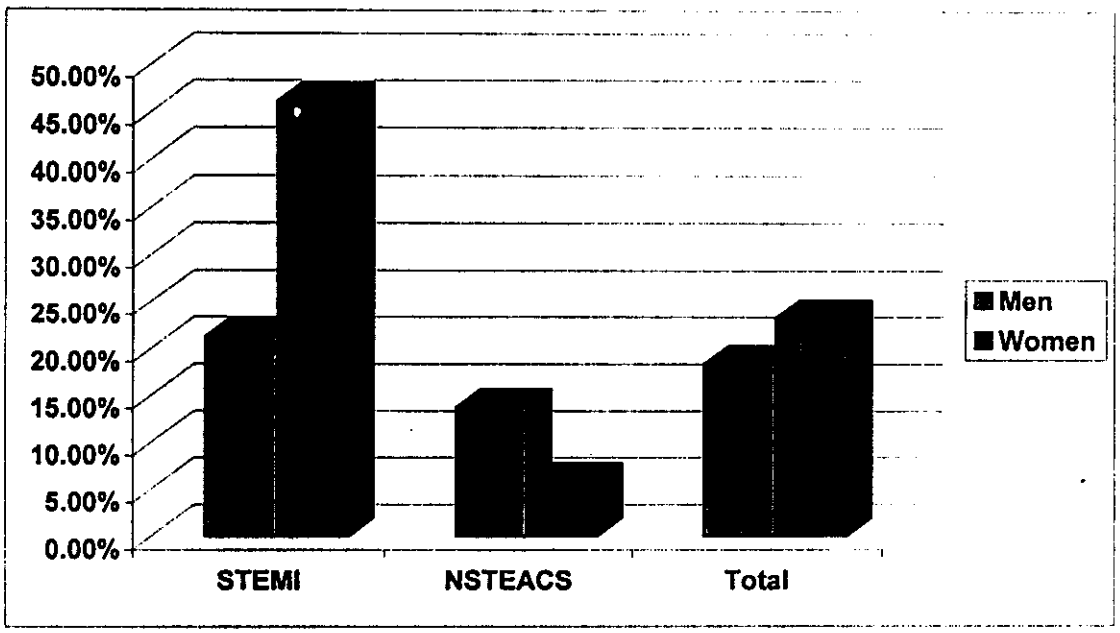

Fig. (7): In- hospital mortality rats in patients with ACS.

Table (16): Causes of death in men and women with acute coronary syndromes :

Causes of death.	*Men (No =14)*	*Women (No=14)*	*Total (No = 28)*
Heart failure	8 (57%)	8 (57%)	16 (57%)
Arrhythmias	4 (28.6%)	3 (21.5%)	7 (25%)
Pneumonia	1 (7.2%)	2 (14.3%)	3 (10.8%)
Stroke	1 (7.2%)	1 (7.2%)	2 (7.2%)

No difference was observed as regard causes of death between men and women. Heart failure was the most common cause of death in both groups.

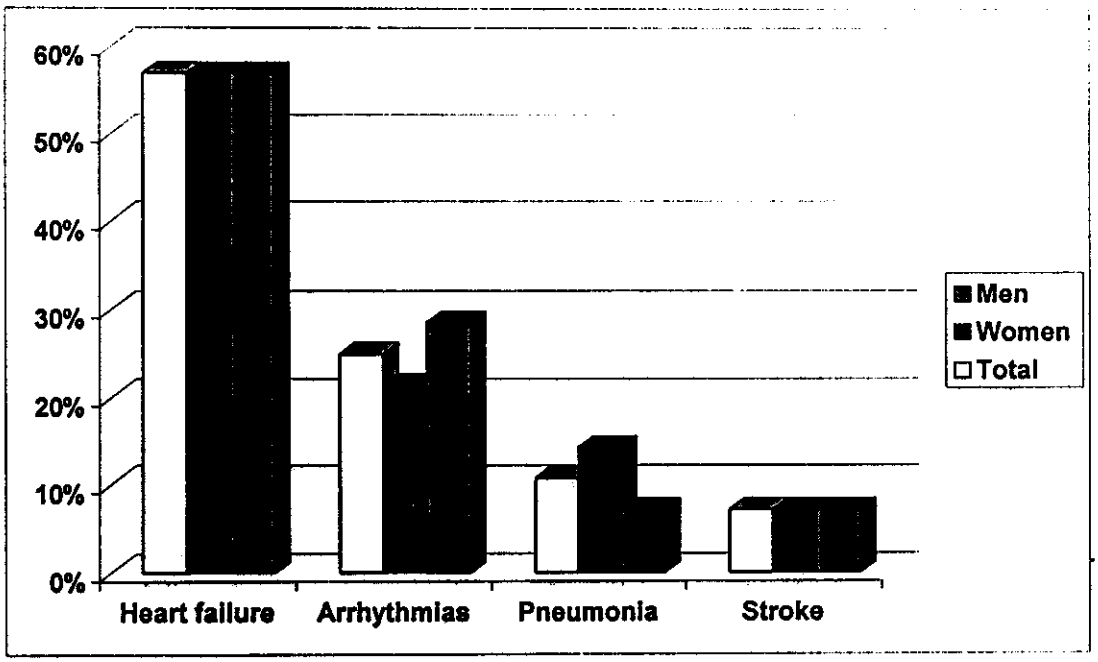

Fig. (8): Causes of death in men and women with ACS.

Table (17): In-hospital mortality after adjustment to age in patients with STEMI

	Men (no = 47)		Women (no =26)		P. Value
	No	Death no (%)	No	Deaths no (%)	
< 75 y	43	8 (18.6%)	21	9 (42.9%)	0.03
> 75y	4	2 (50%)	5	3 (60%)	NS

- After stratification of men and women with STEMI into two age groups, 1st group < 75 years and 2nd group > 75y there was a significant interaction between sex and age with respect to in hospital mortality.
- women less than 75 years old had significantly higher mortality rate (more than twice) than men with comparable age. However no significant difference in mortality was found among older patients.

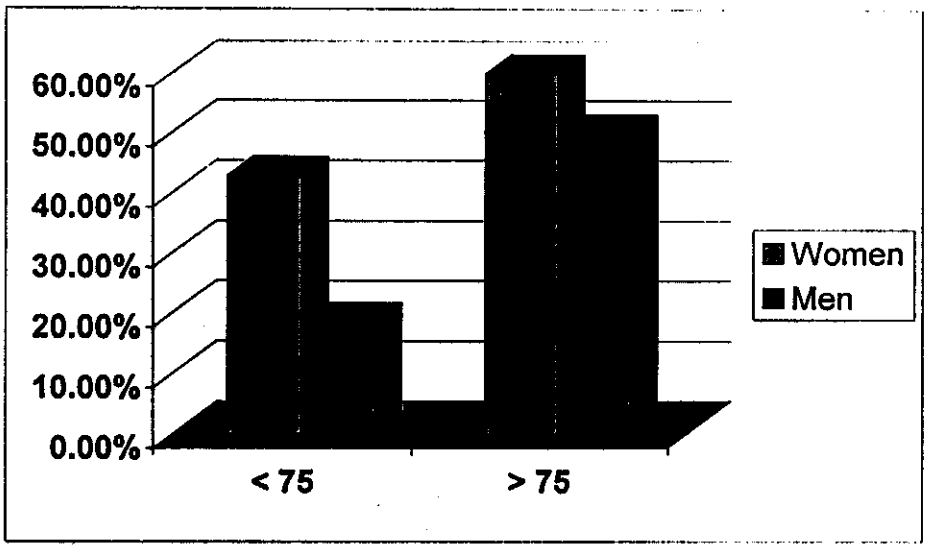

Fig. (9): In-hospital mortality after adjustment to age in patients with STEMI

Table (18): In-hospital mortality rate among diabetic and non diabetic women with STEMI

Variables	Diabetic women (no=9) No (%)	Non diabetic women (no=17) No (%)	P. value.
In hospital mortality	5 (55.5%)	7 (41.2%)	NS

- There was no significant difference in mortality between diabetic and non diabetic women with STEMI.

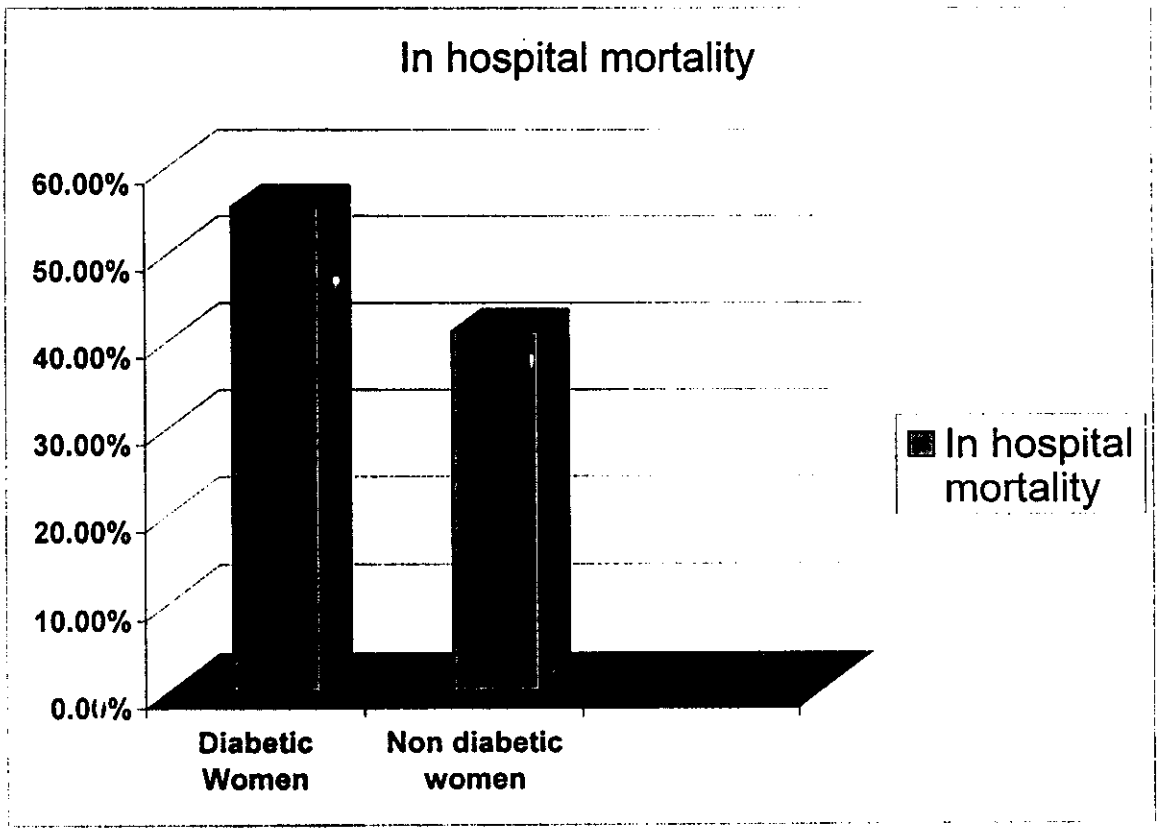

Fig. (10): In-hospital mortality rate among diabetic and non diabetic women with STEMI

Table (19): In-hospital mortality rate among diabetic men and diabetic women with STEMI

Variables	Diabetic men (no=11)	Diabetic women (no=9)	P. value.
In hosp mortality	6 (54.5%)	5 (55.5%)	NS

- There was no significant difference in mortality between diabetic women and diabetic men with STEMI.

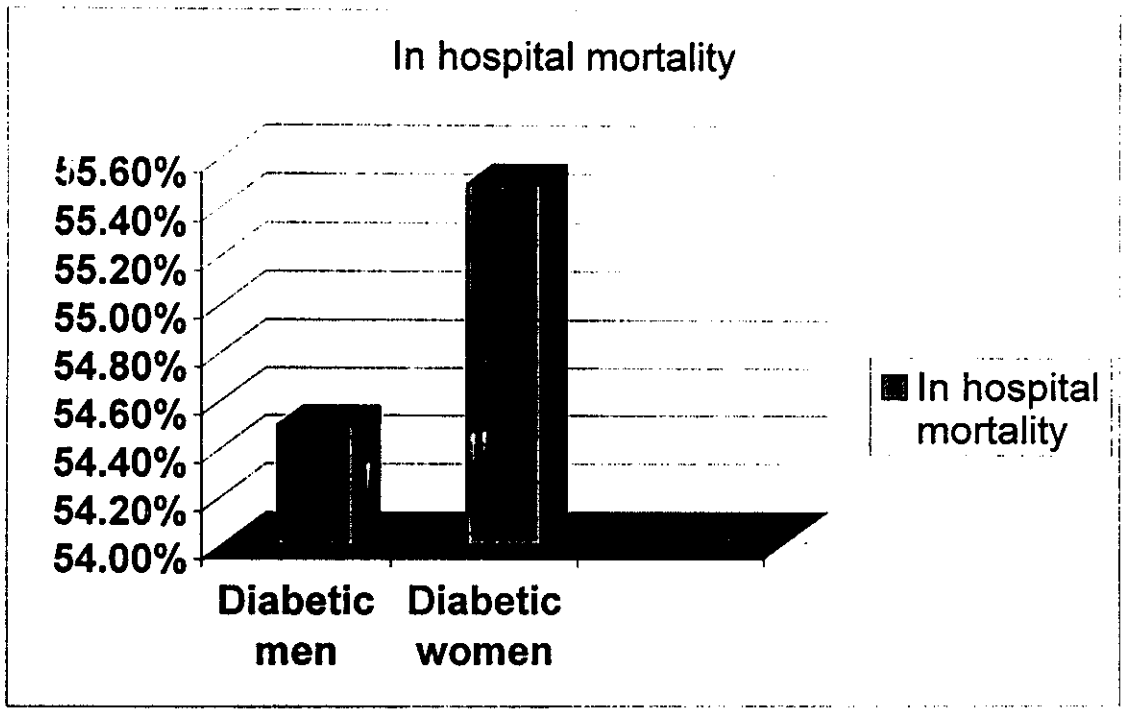

Fig. (11):_In-hospital mortality rate among diabetic men and diabetic women with STEMI

Gender as a predictor of in- hospital mortality in patients with ACS

After multivariate analysis, gender was n't an independent predictor of mortality in either patients with STEMI or NSTEACS The independent predictor of mortality in patients with STEMI was heart failure (killip class ≥ II) during hospitalization **(odds ratio = 4.6 , p. value = 0.009).** The independent predictors of in hospital mortality in patients with NSTEACS were older age < 75 / ≥ 75 years, **(odds ratio = 0.12, p. value = 0.01)** and sinus tachycardia on admission **(odds ratio = 1.15, p. value = 0.006).**