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Sex Differences in Risk Factors, in Hospital Mortality and Treatment among the Patients with AMI in Durres Population.

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Abstract

The objectives for this paper are to investigate the differences in the risk factors, treatment and in hospital mortality between men and women among the patients with AMI in Durres population. Prospective Observational study was used. 259 patients consecutive with acute myocardial infarction (AMI) who presented in the Cardiology Department, Regional Hospital of Durres, Albania between January 2011 to October 2013 were included in the study. Demographic, diagnostic, therapeutic, and clinical data were collected from hospital medical records. Coronary risk factors and previous conditions were assessed by a specific questionnaire administered to patients. All variables were precisely defined and their collection was standardized. The CCU application of various diagnostic and therapeutic procedures was also recorded, including coronary angiography and reperfusion procedures. The results Of 259 pts, 183 (70.6%) were males and 76 (29.4%) were females. The women were significantly older than the men (72 ± 8.7 vs 63 ± 11) $p= 0.001$. Women had a higher proportion of history of diabetes (31.6 % vs.29.0%), hypertension (77.6% vs 64.5%), obesity (57.9% vs 48.6%) but a lower percentage had a history of smoking (19.7% vs. 68.7%), previous AMI (10.5% vs. 14.8%) and revascularization (25.0% vs.41.0%).

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However, there were more men with dyslipidemia (81.9% vs 72.4%) and positive family history (46.8% vs 39.5%). The women more frequently had an AMI of anterior localization (46.1% vs 36.1%), and they had a significantly higher Killip class at admission (Killip IV; 18.4% vs. 10.9%), compared with the men. The women received almost the same pharmacological treatment like men. A significant proportion of men 75 (41.0%) underwent coronary catheterization compared to women 15 (25.0%) $P = 0.015$. Mortality in CCU was significantly higher in women, 10 (5.46% vs 8(10.5%)). $P = 0.05$. The conclusions for the study can be summarized within the following statements; Women have a worse prognosis after an AMI largely as a function of clinical factors. There is a sex difference in the rate of invasive procedures. Women with AMI were older and had a higher incidence of hypertension, obesity and diabetes than men.

Keywords: Acute myocardial infarction; Sex Difference; Outcome; Procedures; Women.

1. Introduction

Coronary heart disease (CHD) and within them, Acute Myocardial Infarction (AMI), is the leading cause of mortality and morbidity in both women and men worldwide. Many of the studies have suggested differences in clinical outcomes between men and women in the acute myocardial infarction (AMI). The prevalence of CHD is greater in men than in women. Men and women have the same coronary risk factors except for the exclusively female experience of menopause and oral contraceptive use. However, according to the Framingham study results [1], ischemic heart disease appears later in women than in men, although this difference reduces and disappears in older age groups. Many recent reports showed that although men are affected in greater numbers, women have been shown repeatedly to have worse short-term outcomes after acute myocardial infarction [2,3]. Older age, history of diabetes, hypertension, hypercholesterolemia, and congestive heart failure have been implicated as contributive factors for higher mortality in women compared to men [4,5-8]. Poorer outcome was often dedicated to less aggressive treatment or underlying co-morbidities [9,10], and women had consistently been shown to be more likely to receive less invasive management compared to men [11-14]. Extensive researches have examined gender differences in use of cardiac procedures and AMI. Women have been reported to undergo cardiac catheterization and consequently revascularization procedures less often than men [15-17,18]. However, some found no significant difference in utilization of cardiac procedures. The aim of our study is to investigate the differences in the risk factors, treatment and in hospital mortality between men and women among the patients with AMI.

2. Materials and methods

In the study were included 259 patients consecutive with acute myocardial infarction (AMI) who presented in the Cardiology Department, Regional Hospital of Durres, Albania between January 2011 to October 2013. Demographic, diagnostic, therapeutic, and clinical data were collected from hospital medical records. Coronary risk factors and previous conditions were assessed by a specific questionnaire administered to patients. All variables were precisely defined and their collection was standardized. The CCU application of various diagnostic and

therapeutic procedures was also recorded, including coronary angiography and reperfusion procedures, primary or subacute percutaneous coronary intervention (PCI). Continuous variables are presented as means (\pm standard deviation) and categorical variables as percentages. Sex related differences were assessed by the chi-square test for categorical variables and by Student's t-test for continuous variables. The differences in survival were assessed with the log-rank test. Multivariate analyses were performed by using Cox proportional models. A p value ≤ 0.05 was considered significant. The approval from the hospital ethics committee was received and this committee has determined that this study is considered a epidemiologic not intervention study, because the pre-existing data used in this study does not contain identifiable private information and is not collected by investigators through intervention or interaction with individuals.

3. Results

Of 259 patients with AMI: 183 (70.6%) males and 76 (29.4%) females. Table 1 lists patient demographics, cardiovascular risk profile, infarction (AMI) characteristics, and mortality rates. The women were significantly older than the men (72 ± 8.7 vs 63 ± 11) p 0.001. A significantly higher percentage of women compare to men had a history of diabetes (31.6 % vs.29.0%), hypertension (77.6% vs 64.5%), obesity (57.9% vs 48.6%) but a lower percentage had a history of smoking (19.7% vs. 68.7%), previous AMI (10.5% vs.14.8%) positive family history (46.8% vs.39.5%), dyslipidemia (81.9%vs 72.4%).Table1. The women more frequently had an AMI of anterior localization (46.1% vs 36.1%), while men presented more with inferior localization (47.0% vs 31.6%).Table2.Women had a significantly higher Killip class at admission (Killip IV; 18.4% vs. 10.9%), compared with the men. Table3. The women received almost the same pharmacologic treatment like men. Table 6 A significant proportion of men compared to women underwent coronary angiography (41.0% vs 25.0%) P 0.015]. Mortality in CCU was significantly higher in women ,10 (5,46% vs 8 (10.5%). P= 0.05. Table 4.

Table 1.Patient demographics, cardiovascular risk profile

Variables	All	Men	Women	Value p
	259	183	76	
Age		63 ± 11	72 ± 8.7	0.001
Diabetes	77(29.7%)	53 (29.0%)	24 (31.6%)	0.05
Smoking	139(53.6%)	124 (68.7%)	15 (19.7%)	0.001
Dyslipidemia	204(78.7%)	149 (81.9%)	55 (72.4%)	0.087
Hypertension	176 (67.9%)	118 (64.5%)	58 (77.6%)	0.04
Prior MI	35(13.5%)	27 (14.8%)	8 10.5%)	0.3
Obesity	133(51.3%)	89 (48.6%)	44 (57.9%)	0.1
Family history	115(44.4%)	85 (46.8%)	30 (39.5%)	0.6
Prior AVC	18(6.9%)	10 (5.5%)	8 (10.5%)	0.1

The women more frequently had an AMI of anterior localization (46.1% vs 36.1%), while men presented more with inferior localization (47.0% vs 31.6%). Table 2

Table 2. Localization of AMI

AMI Location	All	Men	Women	Value p
	259	183	76	0.07
Anterolateral	1(1.3%)	0 (0.0%)	1 (1.3%)	
Anterior	102(39.3%)	67 (36.1%)	35 (46.1%)	
Anterospetal	34(13.1)	21 (12.%)	13 (17.1%)	
Inferolateral	8(3.08%)	6 (3.3%)	2 (2.6%)	
Inferior	110(42.4%)	86 (47.0%)	24 (31.6%)	
Lateral	3(1.6%)	3 (1.6%)	0 (0.0%)	
Posterolateral	1(1.3%)	0 (0.0%)	1 (1.3%)	

Women had a significantly higher Killip class at admission (Killip IV; 18.4% vs. 10.9%), compared with the men. Table 3.

Table 3. According to Killip class at admission

Killip class at admission	All	Men	Women	Value p
	259	183	76	0.2
I	162 (62,5%)	120 (68.9%)	42 (55.3%)	
II	30 (11.5%)	18 (12.0%)	12 (15.8%)	
III	38 (14.6%)	30 (18.2%)	8 (10.5%)	
IV	29 (11.1%)	15 (10.9%)	14 (18.4%)	

Of the 259 cases, 90 (34.7%) were offered coronary angiography. A significant proportion of men 75 (41.0%) underwent coronary catheterisation compared to women 15 (25.0%) P 0.015]. For those who underwent the procedure 68 men and 9 women subsequently underwent successful PCI. Mortality in CCU was significantly higher in women, 10 (5,46% vs 8(10.5%). P= 0.05. Table 4.

Table 4. Coronary angiography and CCU mortality

Variables	All	Men	Women	Value p
CCU Angiography	90(34.7%)	75 (41.0%)	15 (25.0%)	0.015
CCU Mortality	18(6.94%)	10 (5,46%)	8 (10.5%)	0.05

Females were less likely to undergo invasive procedure, even after correcting for age (OR, 1.27; 95% CI, 0.58-2.57; P = 0.05). The factors significantly predicting performance of coronary angiography in the multivariate analysis were lesser age, diabetes, no smoking history, anterior location of AMI and Killip class II. Table5.

Table 5. Adjusted odds-ratio for coronary angiography during CCU stay

	OR	95% CI		Value p
		Lower	Upper	
Age	0.42	0.289	0.608	0.001
Gender F*	1.27	0.588	2.758	0.5
Diabetes	0.09	0.282	1.103	0.09
Smoking	1.24	0.629	2.448	0.5
Prior myocardial infarction	2.689	1.068	6.774	0.03
Killip class at admission				
II	4.940	1.587	15.378	0.006
III	1.457	0.378	5.620	0.5
IV	0.740	0.138	3.952	0.7
AMI location				
Anterior	0.446	0.025	8.026	0.6
Inferior	0.358	0.020	6.551	0.5

* reference men

The women received almost the same pharmacologic treatment like men. Furthermore, the same proportion of women was receiving antiplatelets, the lipid-lowering therapy at discharge in comparison with the men, although a higher proportion was taking ACEIs and betablockers . Tables 6.

Table 6. Drug therapy during hospital stay

	Men	Women	Value p
	183	76	
Aspirin	183 (100%)	76 (100%)	
Clopidogrel	110 (60%)	45 (59%)	0.8
Betablockers	107 (58.5%)	56 (73.7%)	0.01
ACEIs	111 (60.6%)	55 (72.4%)	0.04
Nitrates	174 (95.1%)	61 (80.2%)	0.001
Calciumblockers	14 (7.7%)	3 (3.95%)	0.1
Lipid lowering drugs	179 (97.8%)	74 (97.4%)	0.4

4. Discussion

The question of whether higher morbidity and mortality observed in women are due to essential differences in the biology and pathophysiology of AMI between gender groups is hotly debated and still unresolved.[19-20]. Many of these differences have been explained by the presence of more comorbidities, older age and worse clinical manifestation in women than in men[21,22,23]. The clinical history, especially age and frequency of diabetes, AMI type, and clinical situation at admission of the women in this study implied a worse prognosis than the men, indicating the need for a more intervention list approach. This study is the first to investigate sex differences in the risk factors, in hospital mortality and treatment of patients with AMI in Durres, Albania. We found that female patients have a significantly different clinical profile than men. We found that females tend to be older and had a higher burden of comorbidities. There was a higher number of diabetic among the female patients (31.6% vs 29.0%). Diabetes mellitus is associated with more diffuse disease and left ventricular dysfunction post infarction [24-25]. However, significantly fewer women than men underwent primary reperfusion procedures [26,27]. Perhaps females, being older at presentation, resulted in lower tendency to prescribed invasive procedures. Many authors have also observed that women less frequently receive treatments known to be equally beneficial to both sexes, including betablockers, ACEIs, antiplatelets, and revascularisation [28,29]. Indeed, our study showed that women receive already the same pharmacological treatment like men, including betablockers, ACEIs, antiplatelets, lipid lowering drugs but less frequently received coronary angiography, PCI, or revascularization surgery compared with men. As anticipated, given the worse AMI prognosis of these women at admission, their short-term mortality rates were significantly higher than those of the men. Most studies that reported a significantly higher mortality in women with AMI found, in common with the present study, that higher age, greater presence of comorbidities, and type of AMI presentation played a role in this gender difference [30-32]. Therefore, part of this gender difference in mortality may be due to a difference in therapeutic approach, since women less frequently received primary reperfusion techniques. Our findings are consistent with those of previous studies stating gender-based differences.

A study using data from the Global Registry for Acute Coronary Events (GRACE) that examined 43,393 patients (14,180 women and 29,213 men) with acute coronary syndromes from 14 countries observed similar patterns. In the GRACE study, women with ACS were more likely to be older, have higher rates of hypertension, diabetes, and high cholesterol, and have prior heart failure compared with male patients, whereas men were more likely to smoke, have undergone PCI. In our study, 29.4% of patients with AMI were women. Women presenting with AMI were older than men and had higher rates of cardiovascular risk factors (diabetes mellitus, hypertension, hyperlipidemia, obesity) and a lower rate of smoking than of men.

5. Limitations.

Our findings should be interpreted with caution due to the study's limitations. First, there is a small number of patients included in this study. We cannot rule out that a disproportionate number of men or women with AMI died before presentation to the hospital, as well as a number of cases that have gone directly for PCI without coming to our hospital. The second, database included all forms of acute myocardial infarction regardless of delay to presentation, presence of ST-segment elevation, and eligibility for reperfusion therapy. We could not account for some factors as quality of life, noncardiac comorbidity, functional status, and patients preferences.

6. Conclusions.

In hospital mortality was higher in women than men. Women have a worse prognosis after an AMI largely as a function of clinical factors. There is a sex difference in the rate of invasive procedures. Women received ready the same pharmacological treatment as men. Women with AMI were older and had a higher incidence of hypertension, obesity and diabetes compared to men. Women more frequently had an AMI of anterior localization and a significantly higher Killip class at admission. Our results suggest that appropriate measures are needed to reduce the high mortality rates in women patients with AMI and to increase the awareness on risk factors for patients with cardiovascular disease.

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