

Research Article

Differences in the risk factors and inpatients outcomes of patients with acute myocardial infarction by race in Durres population

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Abstract

Background: A little is known about the differences in clinical and angiographic features and the outcomes of patients with acute myocardial infarction by race.

Aim: The purpose of this study was to determine the difference in the frequency of risk factors and in-hospital outcome among patients with AMI by race in Durres population, Albania.

Methods: In the study were enrolled 499 patients with acute myocardial infarction hospitalized in cardiology department in regional hospital Durres, Albania, from September 2012 to September 2015. Demographic, risk factors and clinical data were collected from hospital medical records. Differences in distribution of risk factors and inpatients outcomes by race were assessed by the chi-square test for categorical variables and by Student's t-test for continuous variables. A p value < 0.05 was considered significant.

Results: Of 499 patients, 49 participants (9.8%) belonged to the black race. Compared with white patients, the black patients with AMI were younger (62.5 vs. 65.8 years old $p < 0.05$), had more frequently a positive family history (65.2% vs. 40.3%, $p < 0.05$), a higher percentage of history of smoking (77.6% vs. 52.6%, $p < 0.05$) and a higher percentage of obesity (65.3% vs. 51.2% $p < 0.05$). The black patients were less likely to undergo coronary angiography and coronary revascularization after the AMI episode. There was no difference in the in-hospital mortality and complications rate between two groups of race.

Conclusions: The risk factors for an AMI event are more likely to be present among patients who belong to black race. The black patients received less frequently a coronary angiography after episode of AMI. However, no difference was found in the complications and in-hospital mortality rate between two groups.

Keywords: acute myocardial infarction, race, risk factors, outcome, patient.

Introduction

Cardiovascular disease, including acute myocardial infarction, remained the main cause of morbidity, mortality and disability at work in the worldwide. Important disparities continue to exist in cardiovascular care of racial and ethnic minorities. A great number of these inequalities can be due to dominance of risk factors among minority groups, including dyslipidemia, obesity hypertension, diabetes, and metabolic syndrome. Other possible interpretations for disparities in cardiovascular care include patient-related factors, such as race, gender, age, geographic position, socioeconomic status, marital status, medical insurance status, and comorbidities disease that in patients with ischemic heart disease may be related with declined rates of application of treatment strategies [1-7]. According to Framingham Heart Study, CVD risk factors are faintly determined in racial and ethnic minority groups. The benefit of these risk factors has been well documented in whites [8] but limited data are reported regarding the prediction of cardiovascular disease in African Americans by the Framingham risk factors [9].

Racial and ethnic inequalities in cardiovascular health care are widely documented. A number of studies have emphasized the presence of racial and ethnic differences in cardiovascular care [10]. In United States have been often reported gender and race/ethnic inequalities. Among those with acute coronary syndromes, women and minority groups are less likely to receive cardiac catheterization,

thrombolytic therapy, revascularization therapy (percutaneous coronary interventions or coronary artery bypass graft surgery), but there are relatively few data evaluating the medical treatment of black patients compared to men and whites [11-19]. Data from some epidemiologic and clinical studies have reported that since 1950 mortality from cardiovascular disease is reduced steadily [20], but this reduction has been larger in whites than in blacks [21, 22].

The purpose of this study was to determine the difference in the frequency of risk factors and in-hospital outcome among patients with AMI by race in Durres population, Albania.

Patients and Methods

In the study were included 499 consecutive patients with acute myocardial infarction hospitalized in cardiology department in regional hospital Durres, Albania, from September 2012 to September 2015. AMI has been diagnosed according to the World Health Organization definition according to which the patients were proved to have at least two of the following three criteria: typical chest pain for myocardial ischemia lasting for at least 30 min, ST elevation of >2 mm in two or more leads and enzymatic evidence of myocardial necrosis. In black and white patients with AMI we analyzed some

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risk factors as hypertension, blood lipids, diabetes, age, cigarette smoking, obesity, positive family history for premature CHD, previous MI, cerebral vascular accident, serum creatinine levels, angiographic characteristics and in hospital outcomes. Demographic, diagnostic, therapeutic, and clinical data were collected from hospital medical records. In-Hospital outcomes were measured in terms of hemodynamic complications, disturbance of rhythm, hospital stay and in hospital death. Differences in distribution of risk factors and inpatients outcomes by race were assessed by the chi-square test for categorical variables and by Student's t-test for continuous variables. A p value < 0.05 was considered significant. The hospital ethical committee approved the study protocol.

Results

Of 499 patients with AMI: 346 (69.3%) males and 153 (30.7%) females. Of them 450 (90.2%) were whites and 49 (9, 8%) were blacks. The mean age of patients was 65.5±11.4. Compared with white patients, the black patients with AMI were younger (62.5 vs. 65.8 years old p<0.05). The black patients were presented in a higher percentage in the group age ≤ 60 and 60-70 years (32.7 % vs 31.8% and 51% vs 34% respectively) compared with whites patients but in the group age >70 yrs the number of black patients with AMI were reduced in comparison with whites (16.2% vs 40%) Figure 1. The black patients had more frequently a positive family history (65.2 % vs. 40.3%, p <0.05), a higher percentage of history of smoking (77.6% vs. 52.6%, p <0.05) and a higher percentage of obesity (65.3% vs. 51.2% p<0.05). Also they had a higher percentage of hypertension (77.6% vs.70.9%) but no the statistical significance. In both groups, no significant difference was observed in lipid parameters, diabetes, Previous MI between blacks and whites. Table 1. Figure 2.

No significant difference was found regarding the localization of

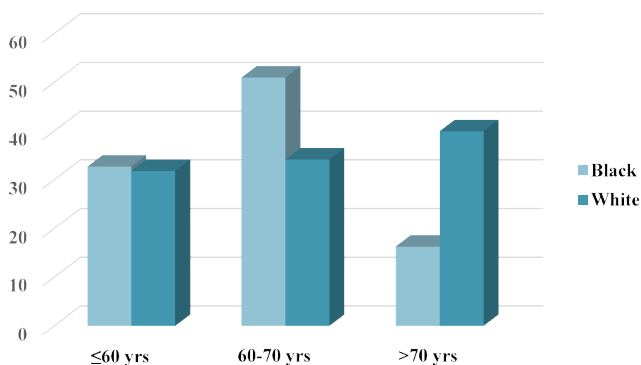


Figure 1: Distribution of AMI in black and white by age group.

Table 1: Patient demographics and cardiovascular risk profile by race.

Variable	Total Nr (%)	White Nr (%)	Black Nr (%)	P value*
Age				0.021
≤60 yrs	159 (31.9)	143(31.8)	16(32.7)	
60-70 yrs	179(35.9)	154(34.2)	25(51)	
>70 yrs	153(32.3)	153(40)	8(16.3)	
Hypertension	357 (71.5)	319 (70.9)	38(77.6)	0.326
Diabetes	162 (32.5)	151(33.6)	11(22.4)	0.115
Smoking	274 (55)	236(52.6)	38(77.6)	0.001
Cholesterol ≥ 240	356(71.3)	321(71.3)	35(71.4)	0.989
Triglyceride ≥ 150	88(17.6)	79(17.6)	9(18.4)	0.884
Previous MI	53(10.6)	45(10)	8(16.3)	0.172
Post AVC	31 (6.2)	28(6.2)	3(6.1)	0.975
Obesity	262(52.6)	230(51.2)	32(65.2)	0.062
Family history	215(43.1)	183(40.7)	32(65.3)	0.01

*chi square, p<0.05 is considered significant

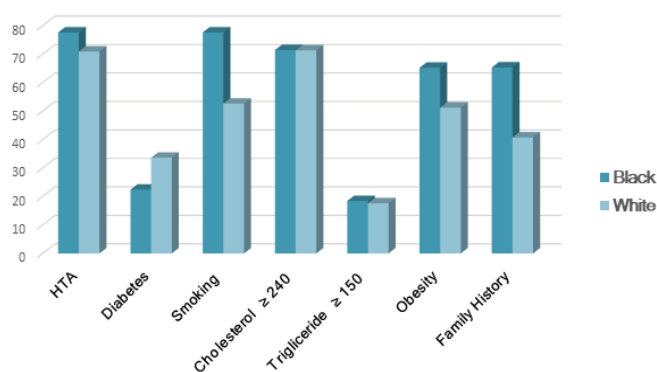


Figure 2: Distribution of risk factors by race.

AMI. Based on the coronary angiographic results, the black patients were less likely to undergo coronary angiography and coronary revascularization after the AMI episode. They had a higher percentage of CHD 2 or ≥ 3 vessel disease than white patients (42.9% vs 34.6% and 42.9 % vs.22.5% respectively) but no significant difference. In contrast, more white patients underwent coronary angiography and primary percutaneous coronary intervention (PCI) as compared to black patients (42.4 % vs. 15.1% and 82.6% vs. 57.1%, all p-values <0.05). Table 2 There was no significant difference in the incidence of complications like pulmonary edema, cardiogenic shock, AV block, asystole, atrial fibrillation, VF and sustained VT between black and white patients. There was no significant difference between the left ventricular ejection fraction and level of creatinine in the both groups. The hospital stay was longer in black than white patients P<0.01. There was no difference in the in-hospital mortality between black and white patients. Table 3

Table 2: The localization of AMI and angiographic characteristics in both groups.

Variable	Total Nr (%)	White Nr (%)	Black Nr (%)	P value*
AMI location				0.585
Anterior	210(42.1)	189(42)	21(42.9)	
Antero septal	57(11.4)	54(12)	3(6.1)	
Inferior	12(2.4)	10(2.2)	2(4.1)	
Posterior	214(42.9)	191(42.4)	23(46.9)	
Coronary Angiography	196 (39.3)	191(42.4)	7(15.1)	0.001
One vessel disease	83(41.9)	82 (42.9)	1(14.3)	
Two vessel disease	69(34.8)	66(34.6)	3(42.9)	
≥ Three vessel disease	46(23.2)	43(22.5)	3(42.9)	
Revascularization				0.087
PCI	161(81.3)	157 (82.6)	4 (57.1)	
CABG	37(18.7)	34 (17.3)	3(42.9)	

*chi square p<0.05 is considered significant

Discussion

Apart from the efforts to improve constantly the health care, important disparities continue to exist in the cardiovascular care of racial and ethnic minorities. This is more reliable even when income, socioeconomic condition, education level, and site of care are considered.

This current study is the first to investigate the profile of risk factors and in-hospital outcomes in black and white patients with AMI in Durres, Albania. Of the 499 patients with acute myocardial infarction, 9, 8% were blacks and 90.2% whites. In our study the black patients with AMI were younger (62.5 vs. 65.8 years old p<0.05). The black patients with AMI were presented in a higher percentage in the group age ≤ 60 and 60-70 years but the number of them were reduced in the group age >70 yrs. Our data were similar with one reported by Sonel et

Table 3: Comparison of in-hospital outcome in black and white patients.

Variable	Total	White	Black	P value*
Complications	Nr (%)	Nr (%)	Nr (%)	0.266
Pulmonary Edema	36(7.2)	30(6.7)	69(12.2)	
Cardiogenic shock	24(4.8)	20(4.5)	4(8.2)	
Killip class at admission				0.203
I	309 (61.9)	284(63.1)	25(51)	
II	60(12)	55(12.2)	5(10.2)	
III	57(11.4)	49(10.9)	8(16.3)	
IV	73(14.6)	62(13.8)	11(22.4)	
Ventricular Fibrillation	31 (6.2)	25(5.6)	6(12.2)	
AV Block	7(1.4)	7(1.6)	0(0)	
Ventricular Tachycardia, ESV	26(5.2)	25(5.6)	1(14.3)	
Atrial Fibrillation	49(9.8)	43(9.6)	6(12.2)	

*chi square $p < 0.05$ is considered significant

Variable	Total	White	Black	P value**
Stay hospital \pm SD	7.57 \pm 3.7	7.4 \pm 3.7	8.8 \pm 3.4	0.01
Creatinine \pm SD mg/dl	1.05 \pm 0.76	1.04 \pm 0.72	1.13 \pm 1.09	0.445
Ejection Fraction \pm SD %	0.53 \pm 0.09	0.53 \pm 0.09	0.524 \pm 0.10	0.57
In hospital death	51(10.2)	45 (10)	6(12.2)	0.622

** t test $p < 0.05$ is considered significant

al [12] and Amal N. Trivedi [23]. We found that the black patients had more frequently a positive family history (65.2 % vs. 40.3%, $p < 0.05$), a higher percentage of history of smoking (77.6% vs. 52.6%, $p < 0.05$) and a higher percentage of obesity (65.3% vs. 51.2% $p < 0.05$). Also they had a higher percentage of hypertension (77.6% vs. 70.9%) but no the statistical significance. Leifheit-Limson EC [24] and G. Graham [25] and reported similar results. In our current study, different from them, no significant difference was observed in lipid parameters, diabetes, level of creatinine, previous MI between blacks and whites. Many investigators have found that blacks receive fewer invasive cardiac procedures than whites in a variety of settings [26-28,31]. The similar results we found in our study. The black patients were less likely to undergo coronary angiography and coronary revascularization after the AMI episode. They had a higher percentage of CHD 2 or ≥ 3 vessel disease than white patients but no significant difference. The reasons for the disparities reported in this paper are not clear. The procedure of coronary revascularization is accepted and recommended for the treatment for myocardial infarction (MI) nowadays and is the leading of medical interventions in the United States, with more than 1 million procedures each year [29]. However, the rate of catheterization and revascularization procedures in the blacks remained still low. Some authors have reported that these disparities can be related with socioeconomic considerations, insurance factors, low-income and level of education, elements of discrimination and racism that affect socioeconomic status [30-33]. Some others explained that there are racial differences in genetics [34], but the information on clarifying differences in clinical presentation and response to medical therapy is still unclear and misunderstood. In our study we found no difference in-hospital mortality and complication rates between whites and blacks. Similarly, Khambatta S, Seth M, Rosman HS, et al. [35] reported no difference in mortality among blacks and whites. Because race is a complicated social context, continued research will be needed to find more information on socioeconomic, metabolic, genetic, and treatment characteristics to explain the impact of each to racial differences in MI outcomes. It is needed a rational strategy along with public health attempts based on cutting down health risks and their related comorbidities, to eliminate racial inequalities.

Limitations

Our study have some limitations. The small number of patients enrolled in the study because of the results for smaller subgroups

should be interpreted with caution. This was a small single center study and selection bias might exist. We cannot exclude that an exaggerated number of black and white patients with AMI died before presentation to the hospital. Our study included data on in-hospital mortality and no follow up data were taken. Therefore, these findings should not be generalized. Our results suggest that appropriate measures are needed to increase the awareness on risk factors for patients with cardiovascular disease.

Conclusion

The risk factors for an AMI event are more likely to be present among patients who belong to black race. The black patients received less frequently a coronary angiography after episode of AMI. However, no difference was found in the complications and in-hospital mortality rate between two groups.

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