

Race Matters: Disparities in Patients Presenting to the Emergency Department with Potential Acute Coronary Syndrome

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Race and Heart Disease



- Individuals with fewer resources have worse health outcomes
- These individuals are disproportionately persons of color

Race and Heart Disease

Blacks have more risk factors for heart disease¹⁻³

- Among the highest prevalence of hypertension (44%) in the world⁴
- Strikingly disproportionate burden of diabetes mellitus in the US⁴

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Race and Heart Disease

Blacks with heart disease are disadvantaged when receiving treatment

- When Blacks present with chest pain, CHD is suspected less often than for Whites⁵
- Initial diagnostic evaluations are completed less often than for Whites⁵
- Blacks are less likely to receive any cardiac intervention or percutaneous coronary intervention (PCI) compared to Whites^{3,6,7}

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Race and Heart Disease

Blacks have worse outcomes from heart disease

- The 2010 overall rates of death attributable to CVD (per 100,000) were 278.4 for white males, 369.2 for black males, 192.2 for white females, and 260.5 for black females⁴

Objective



To examine disparities in clinical presentation, treatment, and patient-reported outcomes between non-Hispanic Blacks and non-Hispanic Whites presenting to the emergency department (ED) with potential acute coronary syndrome (ACS)

Sample

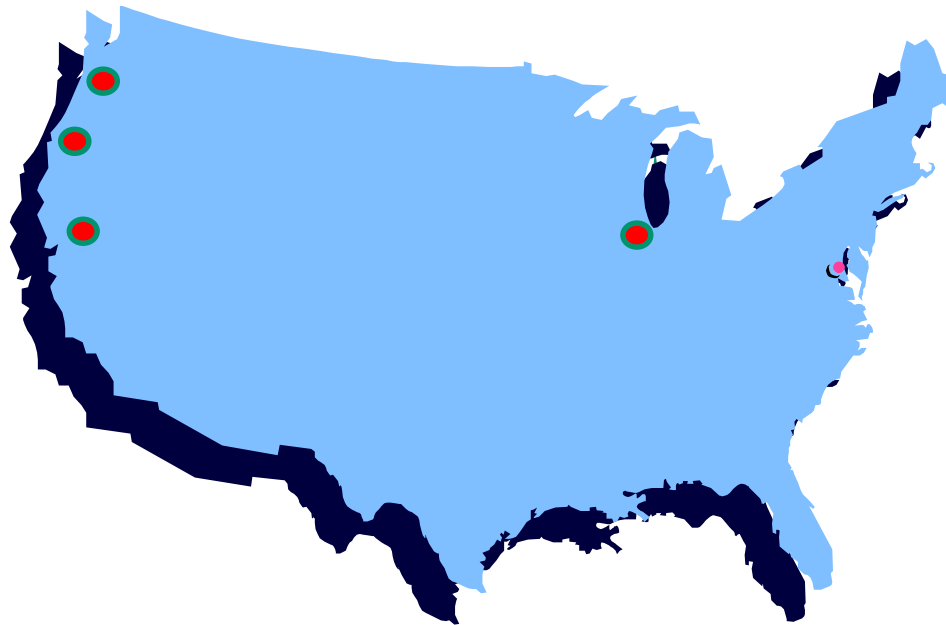


Patients admitted to the emergency department:

- Symptoms triggering a cardiac workup
- Transported by ambulance or walk-in
- Participants (n = 663)
 - 116 non-Hispanic Black patients (17.5%)
 - 547 non-Hispanic White patients (82.5%)

Setting

4 busy emergency departments (3 academic)
in the Midwest, West, and Pacific Northwest



Measures

- ACS Symptom Checklist
 - 13 symptoms
- ACS Patient Information Questionnaire
 - patient reported info. on demographic & clinical variables
- Froelicher's Health Utilization Questionnaire-revised
 - measures a variety of health services utilization variables
- Medical Record Review Form
 - Diagnosis, treatment variables
- Prehospital Delay
 - Patients asked “when did the symptoms responsible for this admission start”

Procedures

- Research staff completed ACS symptom checklist with 15 min. of arrival in triage (waiver of consent)
- Enrollment 6a-11p, 7 days/week
- Research staff completed other measures and obtained written consent in exam room
- 16.7% declined to participate

Data Analyses

- Significance set at $p \leq 0.05$ for all tests
- ANOVA or t-tests for normally distributed data
- Chi-square for categorical variables
- Logistic regression for predictors of diagnosis
- Cox proportional hazard model for prehospital delay

Demographic Characteristics

	ACS			No ACS		
	Black (n=51)	White (n=232)	p	Black (n=65)	White (n=315)	p
Age-mean (SD)	56.4 (11.6)	63.2 (12.2)	<0.001	57.3 (14.6)	60.2 (15.4)	0.157
Females- n (%)	18 (35.3)	61 (26.3)	0.194	35 (53.8)	141 (44.9)	0.188
Education- n (%)			0.034			0.169
HS diploma or less	25 (49.0)	74 (33.2)		25 (39.7)	92 (30.8)	
Some college or more	26 (51.0)	149 (66.8)		38 (60.3)	207 (69.2)	
Annual Income- n (%)			0.004			0.027
≤20,000	19 (40.4)	44 (22.4)		29 (51.8)	92 (33.0)	
20,001-50,000	20 (42.6)	72 (36.7)		13 (23.2)	86 (30.8)	
>50,000	8 (17.0)	80 (40.8)		14 (25.0)	101 (36.2)	

Notes: ACS is acute coronary syndrome. SD is standard deviation. HS is high school.

Clinical Characteristics

	ACS			No ACS		
	Black (n=51)	White (n=232)	p	Black (n=65)	White (n=315)	p
Diagnosis- n (%)			0.759			
Unstable Angina	13 (26.0)	46 (20.2)				
NSTEMI	30 (60.0)	115 (50.4)				
STEMI	7 (14.0)	67 (29.4)				
Hypertension- n (%)	45 (88.2)	147 (66.2)	0.002	46 (73.0)	176 (59.5)	0.044
Diabetes- n (%)	23 (45.1)	57 (25.7)	0.006	20 (31.7)	75 (25.0)	0.268
Body Mass Index- mean (SD)	31.3 (6.6)	29.2 (6.6)	0.041	30.8 (7.9)	30.4 (7.7)	0.673
Tobacco Use- n (%)			0.015			0.388
No tobacco use	18 (36.0)	109 (50.5)		40 (64.5)	166 (56.5)	
Current tobacco use	21 (42.0)	48 (22.2)		8 (12.9)	58 (19.7)	
Previous tobacco use	11 (22.0)	59 (27.3)		14 (22.6)	70 (23.8)	
Notes: ACS is acute coronary syndrome. SD is standard deviation. NSTEMI is non-ST elevation myocardial infarction. STEMI is ST elevation myocardial infarction.						

Occurrence of Symptoms

	ACS			Non-ACS		
	Black (n=51)	White (n=232)	p	Black (n=65)	White (n=315)	p
Occurrence of Symptom- n (%)*						
Chest Pressure	42 (82.4)	142 (63.7)	0.010	45 (71.4)	173 (57.5)	0.040
Shoulder Pain	21 (41.2)	69 (30.9)	0.160	33 (52.4)	93 (30.9)	0.001
Palpitations	21 (41.2)	38 (17.1)	0.000	20 (31.7)	84 (27.9)	0.540
Chest Discomfort	41 (80.4)	155 (69.5)	0.120	52 (82.5)	190 (63.1)	0.003
Arm Pain	20 (39.2)	83 (37.2)	0.791	31 (49.2)	83 (27.6)	0.001
Chest Pain	44 (86.3)	157 (70.4)	0.021	44 (69.8)	179 (59.5)	0.124
Number of Symptoms - mean (SD)	6.6 (3.7)	5.5 (2.7)	0.018	6.9 (3.3)	5.8 (3.1)	0.011
Notes: Symptoms measured on presentation to ED triage. SD is standard deviation.						

Symptoms Predicting ACS Diagnosis by Race

Prediction of ACS Diagnosis by Symptom for Black Race Compared to Whites (n=636)		
Symptoms	OR	p
Sweating	1.77 (1.16, 2.69)**	0.008
Palpitations	0.55 (0.34, 0.89)*	0.016
Unusual fatigue	0.53 (0.35, 0.80)**	0.002
Arm pain	1.64 (1.06, 2.53)*	0.026
Upper back pain	0.47 (0.29, 0.74)**	0.001

Notes: ACS is acute coronary syndrome. ** p<0.01, * p<0.05, OR = odds ratio.

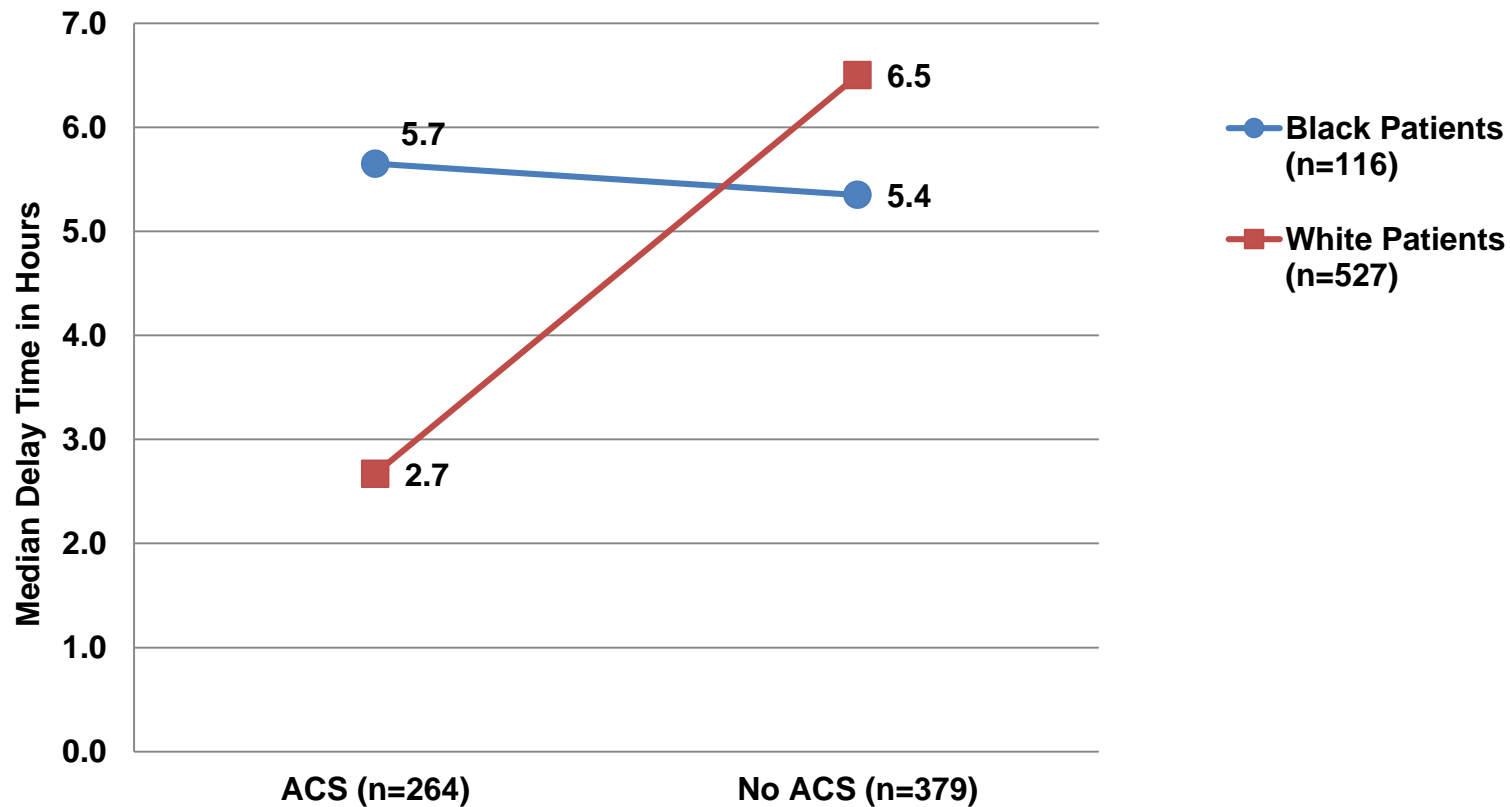
Prehospital Delay Time by Race

	ACS			Non-ACS		
	Black (n=51)	White (n=213)	p	Black (n=65)	White (n=314)	p
Prehospital Delay - Median Hours	5.65	2.67		5.35	6.50	
Prehospital Delay - Hour Cut-points						
≤1 hour	10 (19.6%)	43 (20.2%)	.048	13 (20.0%)	32 (10.2%)	.100
> 1 to ≤ 3 hours	6 (11.8%)	53 (24.9%)		10 (15.4%)	56 (17.8%)	
> 3 to ≤ 168 hours	31 (60.8%)	89 (41.8%)		30 (46.2%)	159 (50.6%)	
>1 week (not included)	1 (2.0%)	11 (5.2%)		5 (7.7%)	19 (6.1%)	
Missing Delay Time	3 (5.9%)	17 (8.0%)		7 (10.8%)	48 (15.3%)	

Note: ACS is acute coronary syndrome. ED is emergency department. Prehospital delay is defined as time of symptom onset until registration in the ED.

Blacks with ACS had longer prehospital delay times than Whites with ACS (median 5.7 vs. 2.7 hours)

Prehospital Delay Time by Diagnosis and Race



Predictors of Prehospital Delay (Adjusted)

Predictor	Hazard Ratio	95% CI		p-value
Black Race	1.07	0.85	1.32	0.590
Age	1.00	1.00	1.01	0.260
Sex	0.93	0.78	1.12	0.470
Diabetes	1.23	1.01	1.49	0.036
ACS Diagnosis	1.31	1.09	1.56	0.003
Greater number of symptoms	0.51	0.44	0.61	0.001
Greater symptom distress	1.05	1.01	1.08	0.015
Abrupt (vs. gradual) symptom onset	1.41	1.18	1.68	0.001

Note: CI is confidence interval. ACS is acute coronary syndrome. Hazard ratios > 1 indicate decreased delay time. Hazard ratios < 1 indicate increased delay time.

Race was not significant in predicting prehospital delay after controlling for covariates

Clinical and Health Services Utilization Outcomes at 1 Month and 6 Months

- Blacks had more clinic visits one month following discharge than Whites (2.4 vs. 1.9; $p=.04$)
- No differences in:
 - Calls to providers
 - 911 calls
 - Visits to emergency department
 - Rehospitalization

Symptom Outcomes at 1 Month and 6 Months

	1 Month						6 Months					
	ACS			Non-ACS			ACS			Non-ACS		
	Black (n=39)	White (n=160)	p	Black (n=43)	White (n=211)	p	Black (n=24)	White (n=125)	p	Black (n=33)	White (n=180)	p
Symptoms- n (%)												
Chest Pressure	12 (32.4)	18 (11.5)	.002	15 (34.9)	56 (26.5)	.266	6 (25.0)	13 (10.6)	.054	5 (15.2)	44 (24.7)	.232
Palpitations	10 (27.0)	16 (10.3)	.007	6 (14.0)	44 (21.1)	.288	5 (20.8)	9 (7.3)	.039	6 (18.2)	36 (20.2)	.787
Chest Pain	12 (32.4)	21 (13.5)	.006	13 (30.2)	50 (23.7)	.366	7 (29.2)	12 (9.8)	.010	6 (18.2)	30 (16.9)	.852
Number of Symptoms mean (SD)	3.3 (3.0)	2.1 (2.4)	.028	4.0 (3.5)	3.4 (3.3)	.321	3.0 (3.7)	1.5 (2.4)	.072	3.1 (3.2)	3.0 (3.4)	.881

Notes: ACS is acute coronary syndrome. SD is standard deviation. ED is emergency department.

Conclusions

Despite tremendous progress in reduced mortality associated with heart disease, significant disparities remain in clinical presentation and outcomes for Blacks compared to Whites

Race and Heart Disease



Thank You



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