PATIENT PREFERENCES: DO THEY CONTRIBUTE TO HEALTHCARE DISPARITIES?

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Objectives: The purpose of this study was to examine the effect of race on whether or not a patient would accept an invasive cardiac procedure when referred by a physician.

Methods: A retrospective longitudinal review of medical records at a public health hospital in southeastern Louisiana was conducted to determine cardiovascular patient acceptance/rejection differences. Patient charts were examined using specific indicators (type of pain, laboratory values, blood pressure, and radiographic tests) to determine which patients were eligible to be referred. In order to be selected, each medical record had to have documentation of a physician referral for an invasive cardiac procedure. Medical charts without this referral were deemed ineligible for the cohort.

Results: Patient preferences were similar for both minorities and Caucasians, despite the fact that the study controlled for disease severity, age, income, sex, race, social support, diagnosis, and family history.

Conclusion: Race did not contribute to disparate acceptance and rejection rates among African Americans and Caucasians. A possible reason for this occurrence is that the site was a teaching hospital, which may indicate more physician oversight and better articulation of treatment options. Future studies should delve deeper into physician and institutional bias in non-teaching facilities during patient/physician interactions. (*Ethn Dis*. 2008;18:89–92)

Key Words: Patient Preferences, Race, Disparities, Teaching Hospitals, Cardiovascular Disease

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INTRODUCTION

Studies have shown that minorities do not receive certain cardiac procedures, even though they can prolong life.[1,2] This finding remains true even when controlling for sex, ethnicity, socioeconomic status, age, access to care, and disease severity.[3–7] Some researchers have documented that physicians are partly to blame—meaning they refer minorities to some procedures that can prolong life less often.[8] However, few have studied patients and their preferences to undergo or decline treatment when offered by a physician.[9–14] One such study documented that African Americans were more likely than Caucasians to refuse coronary artery bypass graft (CABG) surgery when a physician offered it to them and were less willing to undergo treatment.[9] Researchers in another study examined racial disparities using surveys and found that differences were attributed to religious differences and not race. However, because of weaknesses in the study's design, these same researchers followed up their study and contradicted its results, concluding that African Americans were more doubtful of their care when compared to Caucasians.[11] Still other less valid studies have concluded that racial differences occur in medical care.[12–14]

This study will attempt to further these studies by examining patient preferences among African Americans and Caucasians. Therefore, the aim of this paper is to examine the acceptance and rejection of an invasive procedure by minorities when a physician offers it.

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METHODS

In assessing a patient's decision to accept or decline preferred treatment when informed by a physician (patient preferences), race, sex, co-morbidity, income, age, and diagnoses, need to be examined. These factors have been shown to influence a patient's decisions. Therefore, our model includes those variables.

Site

A retrospective longitudinal review of medical records at a public health hospital in southeastern Louisiana was conducted to determine cardiovascular patient acceptance/rejection differences. This hospital is located in a metropolitan area and is responsible for serving ≈150,000 indigent patients each year. Furthermore, African Americans make up 67.6% of all patient visits, while Caucasians and Hispanics make up 26.3% and 3%, respectively. Although this hospital does not perform invasive procedures, it does refer patients to another public hospital ≈80 miles away. Transportation is provided to those patients in need, so access to care is controlled for.

Sample

A Shared Medical Systems database was used to identify those patients with a principal diagnosis of myocardial infarction (International Classification of Diseases, Ninth Revision, Clinical Modification [ICD-9-CM] codes 410.0 through 410.9), unstable angina (codes 411.1 or 411.8), chronic ischemic heart

disease (414.0, 414.8, or 414.9), angina pectoris (413.0 through 413.9), or chest pain (codes 786.50 through 786.52) from 1998 to 2000. Only those patients presenting with chest pain were selected. If they had co-morbid diagnoses of stroke, cancer, psychiatric illnesses, abuse of drugs and alcohol, HIV, cirrhosis, dementia, lung disease, or heart failure, the patient was excluded from the cohort. These conditions were barred from the analysis because they are believed to make aggressive management of coronary artery disease less likely.[15] Furthermore, any one of these diagnoses can cause the patient to decline treatment because they may decrease the likelihood the patient will survive the procedure.

Once this list was obtained from the database, a retrospective chart review of medical records was conducted. In order to be selected, each medical record had to have documentation of a physician referral for an invasive cardiac procedure. Medical record charts without this referral were deemed ineligible for the cohort. Additionally, a patient had to present with chest pain and the patient had to meet the patient selection criteria. Patients who met these criteria were selected.

These patient selection criteria consist of high-risk indicators. These indicators include type of pain, laboratory values, blood pressure, and radiographic tests. Physicians use these clinical markers to determine a patient's eligibility for cardiac catheterization and, subsequently, CABG and percutaneous transluminal coronary angioplasty (PTCA).[16]

Patients who did not meet these criteria were not eligible because patient preferences assume that patients can make valid choices regarding treatment when given alternatives. Therefore, patients outside of these criteria would possibly decline treatment because they may not need these procedures. Before conducting this research, approval was obtained from the institutional review board at Southern University A&M—Baton Rouge in conjunction with the hospital in the study. Furthermore, human subjects were kept anonymous.

Data Analyses

A binary logistic regression technique was used to examine the frequency of patients' acceptance/rejection, given several factors. This technique was used to analyze models with a dummy dependent variable. A logistic regression and a probit statistical technique can be used to examine the relationship between dummy dependent variables and a set of explanatory variables. However, in a probit model the function is the opposite of the standard normal curve, whereas the function is the normal log of odds in the logistic regression.[17] Thus, the logistic model is easier to interpret because it can be written as a linear model for the log of odds.[18] Also, the probit model does not provide an odds ratio, which explains the relationship between the variable and the event.[17]

The dependent variable in the model is whether the patient accepted or rejected an invasive treatment when he was informed that this was the best option by a physician (Yes/No)? Patients who followed through and had an invasive procedure were deemed as having accepted treatment, while patients who did not have an invasive procedure were supposed as rejecting treatment. The confounders are primary diagnosis, race, sex, co-morbidity, income, age, social support, family history, and stress.

Principal diagnoses are grouped into six different conditions: myocardial infarction, unstable angina, chronic ischemia, angina, chest pain, and all other circulatory diseases. Co-morbidity is used as a proxy for disease severity. These co-morbid diagnoses were tallied numerically, and the more co-morbid diagnoses, the greater the expected severity of cardiovascular disease.

In order to decode if patient preferences exist, gender was coded using dichotomous variables. Race is divided into five different categories (African-American, Caucasian, Hispanic, Asian, and other). Although all patients were considered, only African Americans and Caucasians were eligible for the study. Race is coded by using dichotomous variables. Age was divided into seven ranges: $\leq$30, 31–40, 41–50, 51–60, 61–70, 71–80, and $\geq$81 years.

We examined household companions—anyone living in the household besides the patient—as a proxy for social support. Family history indicates a mother, father, or sibling had cardiovascular disease or died from an acute myocardial infarction. Stress was used as a proxy for social factors and was measured by ICD-9-CM codes 308 and 308.9. However, none of the patients that met the criteria were coded with these codes or as having stress. Therefore, stress was not used as a confounder in the study.

RESULTS

Of the total 603 patient charts reviewed, 144 were eligible for the cohort. Patients who underwent an invasive cardiac procedure after a physician referred them were assumed in the model to have accepted the treatment. Characteristics of the sample are shown in Table 1. In Table 1, most of the patients in the cohort were from 41–60 years old. African Americans composed 64.6 percent of the patient population, while Caucasians made up 34.5 percent. Males comprised about 51 percent of the sample, while 49 percent were females. Unmarried patients outnumbered married patients by almost 3 to 1. When considering the diagnoses of patients in the cohort, 26 had acute MI, 9 had unstable angina, 20 had ischemia, 24 had angina, 34 had chest pain, and 31 were other diagnoses. Moreover, 76 accepted an invasive procedure by a physician, while 68 declined.

Table 2 further illustrates that Caucasian women ranked highest in co-

Table 1. Patient demographic characteristics and health diagnoses

Variable	*n*	%
Age (years)		
≤30	0	0
31–40	17	11.8
41–50	45	31.3
51–60	56	38.9
61–70	18	12.5
71–80	8	5.7
≥81	1	.7
Race		
African American	93	64.6
Caucasian	51	34.5
Sex		
Male	71	50.7
Female	78	49.3
Marital Status		
Married	46	31.9
Unmarried	98	68.1
Diagnoses		
Acute myocardial infarction	26	18.1
Unstable angina	9	6.3
Ischemia	20	13.9
Angina	24	16.7
Chest pain	34	23.6
Other diagnoses	31	21.5
Accepted		
Yes	76	52.8
No	68	47.2

morbidities (3.93) compared with African American males (3.83), Caucasian males (3.35) and African American females (3.25). Therefore, Caucasian women had the highest disease severity and African American women had the lowest. While both ethnicities were well below the poverty line, Caucasians posited higher salaries than African Americans. Finally, Caucasian men had the highest acceptance rates (59), followed by African American men (57), African American women (51), and Caucasian women (50). So, men had higher acceptance rates when compared to women.

Logistic Regression Analysis

In Table 3, the strata for the binary logit model are posited. When the model shifts from Caucasian to African Americans, the adjusted odds ratio increased by 1.16. Therefore, African Americans were more likely to accept invasive cardiac treatment when it was offered by a physician. Unfortunately, the model failed to find a statistically significant difference between African Americans and Caucasians ($P<.05$). When the model shifts from women to men, the adjusted odds ratio increased by 1.36. This meant that men were more likely to accept treatment than were women. However, the model failed to find a statistically significant difference ($P>.05$).

In Table 3, only diagnosis variables yielded statistical significance ($P>.05$). Therefore, only certain diagnoses were found to have a bearing on a patient's acceptance of treatment. Patients with Acute MI (heart attack) and Chest Pain (odds ratio 18.82 and 4.95, respectively; $P<.05$) were more likely to accept invasive cardiac treatment than the other diagnoses, when the other confounders are held constant. When holding other confounders constant, the acceptance probability for Acute MI was 0.893, while the probability for Chest Pain was 0.687. These probabilities were 66 and 55 percent less compared to the ones posited by patients with other diagnoses. Furthermore, 88% of the acute MI patients in the model accepted treatment.

The remaining variables in the model were not significant ($P>.05$). This

Table 2. Patient income, comorbidity, and invasive procedure acceptance rates

Confounders	Income	Comorbidity	Acceptance (per 100)
African-American			
Male	4,872.37	3.83	57
Female	5,376.46	3.25	51
Caucasian			
Male	8,139.96	3.35	59
Female	6,545.47	3.93	50

Table 3. Logit model for patient cardiac invasive procedure acceptance

Variables	B	SE	*N* Procedures	Odds Ratio
Alone	−0.31	0.47	42	0.73
History	−0.01	0.51	13	0.99
Death	−0.51	0.82	6	0.60
V41_50	0.66	0.70	8	1.94
V51_60	0.60	0.66	25	1.83
V61_70	−0.14	0.82	8	0.87
V71_80	0.42	1.09	5	1.52
V81	7.01	22.27	1	1108.35
Sex, M/F	0.31	0.43	40/36	1.36
African American/Caucasian	0.15	0.45	22/54	1.16
Acute MI	2.94‡	0.80	23	18.82
Unangina	0.28	0.85	3	1.33
Ischemia	0.05	0.66	6	1.05
Angina	0.68	0.62	12	1.98
Chest Pain	1.60†	0.60	23	4.95
Comorbidity	−0.11	0.10		0.90
Income	0.00	0.00		1.00
Constant	−0.81	1.03		0.44

* denotes significant at .05.
† denotes significant at .01.
‡ denotes significant at .00.
Pseudo R^2 .411.
Abbreviations: Coefficient (B); Standard Error (SE); and Number (N).

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meant that these variables did not affect patient preferences. Variables that did not have a statistically significant affect are: patients that lived alone, comorbid diagnoses, income, age, unstable angina, ischemia, angina, family history of CVD, and family death from CVD.

CONCLUSION

We found that patient preferences regarding a cardiac invasive procedure were equivalent for African Americans and Caucasians. These findings contradict those of the Coronary Artery Surgery Study (CASS), in which Caucasians preferred a more technological approach to treat coronary disease.[13] It also failed to validate the findings of Whittle et al, who found that African Americans were less likely than Caucasians, to report that they would undergo an invasive cardiac procedure (PTCA or CABG).[9]

However, this study validates three studies that did not find racial differences in patient preferences. Kressen et al[10] suggested that disparate treatment may not be due to racial differences in preferences and in another study[11] found that disparate treatment is more likely the cause of physician bias. Peterson et al found that African Americans were not less likely to refuse an invasive procedure (CABG) when offered.[6] Our study was conducted at a teaching hospital, and teaching hospitals tend to have more patient oversight compared to other medical centers. Allison et al found better quality of care at teaching hospitals and found that physicians in these centers more clearly explain treatment options to patients.[19] Previous studies have shown that CABG acceptance disparities occur because patients lack knowledge of the risks of intervention.[9]

This study has several limitations. First, the sample size is small. A larger cohort may have found sex differences. Although 603 patients presented with chest pain during this time, only 144 met the study criteria. The small number of patients selected helped ensure the validity of the design. More patients could have been selected, but the study design may have been compromised. Generalizations from this research are cautioned because of the uniqueness of the institution and the study design.

REFERENCES

1. Alderman EL, Bourassa MG, Cohen LS, et al. Ten-year follow-up of survival and myocardial infarction in the randomized coronary artery surgery study. *Circulation*. 1990;82:1629–1646.
2. Nwosokwa ON, Koss JH, Friedman GH. Bypass surgery for chronic stable angina: predictors of survival benefits and strategies for patient selection. *Ann Intern Med*. 1991;114:1035–1049.
3. Brown SL. Race and sex differences in the use of cardiac procedures for patients with ischemic heart disease. *J Health Care Poor Underserved*. 2002;13:526–537.
4. Hannan EL, Van Ryn M, Burke J. Access to coronary artery bypass surgery by race/ethnicity and gender among patients who are appropriate for surgery. *Medical Care*. 1999;37:68–77.
5. Kressin NR, Peterson LA. Racial differences in the use of invasive cardiovascular procedures: review of literature and prescription for future research. *Ann Intern Med*. 2001;135:352–366.
6. Peterson LA, Wright SM, Peterson ED, Dailey J. Impact of cardiac care and outcomes in veterans with acute MI. *Medical Care*. 2002;40:86–96.
7. Schneider EC, Ceape CC, Weisman JS, Piana RN, Gatsonic C, Epstein AM. Racial differences in revascularization rates: does "overuse" explain higher rates among Whites. *Ann Intern Med*. 2001;135:328–327.
8. Schulman KA, Berlin JA, Harless W, et al. The Effect of race and sex on physicians' recommendations for cardiac catheterization. *N Engl J Med*. 1999;340:618–625.
9. Whittle J, Conigliaro J, Good CB, Joswiak M. Do patient preferences contribute to racial differences in cardiovascular procedure use? *J Gen Intern Med*. 1997;12:267–273.
10. Kressin NR, Clark JA, Whittle J, et al. Racial differences in health-related beliefs, attitudes, and experiences of VA cardiac patients: scale development and application. *Med Care*. 2002;40:72–85.
11. Kressin NR, Chang BH, Whittle J, et al. Racial differences in cardiac catheterization as a function of patients' beliefs. *Am J Public Health*. 2004;12:2091–2097.
12. Diehl AK, Stern MP. Special health problems of Mexican-Americans: obesity, gallbladder disease, diabetes mellitus, and cardiovascular disease. *Adv Intern Med*. 1989;34:73–96.
13. Maynard C, Fischer LD, Passamani ER, Pullum T. Blacks in the coronary artery surgery study. *Circulation*. 1986;74:64–71.
14. Katz JN. Patient preferences and health disparities. *JAMA*. 2001;286:1506–1509.
15. Whittle J, Conigliaro J, Good CB, Lofgren RP. Racial differences in the use of invasive cardiovascular procedures in the department of Veteran Affairs Medical System. *N Engl J Med*. 1993;329:621–627.
16. Gordon T, Garcia-Palmieri MR, Kagan A. Differences in coronary heart disease mortality in Framingham, Honolulu, and Puerto Rico. *J Chronic Disorders*. 1996;27:329–344.
17. Norusis MJ. *SPSS 14.0 Advanced Statistical Procedures Companion*. Upper Saddle River (NJ): Prentice Hill; 2005.
18. Fox J. *Applied Regression Analysis, Linear Models, and Related Methods*. Thousand Oaks (Calif): Sage Publications; 1977.
19. Allison JJ, Kiefe CI, Weissman WN, et al. Relationship of hospital teaching status with quality of care and mortality for Medicare patients with acute MI. *JAMA*. 2000;284:1256–1252.

AUTHOR CONTRIBUTION

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