CARDIOVASCULAR DISEASE IN AFRICAN AMERICAN WOMEN:

A HEALTHCARE DISPARITIES ISSUE

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Abstract:

Objectives: To review the current status of cardiovascular disease (CVD) in African American women compared to Caucasian women in regards to four categories of CVD: coronary artery disease (CAD), hypertension, stroke, and congestive heart failure (CHF), and to call attention to the need to place more emphasis on the need to increase awareness of CVD as the greatest killer of African American females in the United States.

Methods: A review of the recent literature on the subject of CVD in women over the past several years was conducted with a focus on CVD in African American women. Statistical data on incidence, prevalence, morbidity and mortality of CAD, hypertension, stroke, and CHF in black and white women were compared.

Results: Statistical data gathered over the past several years indicate that African American women have greater mortality than Caucasian women from CAD, hypertension, stroke, and congestive heart failure. The mortality rate from CAD is 69 percent higher in black women than in white women. Mortality for black females from hypertension is 352 percent higher than for white females. Age-adjusted stroke death rates are 54 percent higher in African American than in Caucasian women, and the age-adjusted mortality rate per 100,000 is 113.4 versus 97.5 for black and white women, respectively. Incidence, prevalence, and morbidity figures for CAD, hypertension, stroke, and CHF are all higher for African American females than for Caucasian females.

Conclusions: African American women are at exceptional risk for CVD, and more recognition of this fact as well as greater awareness of the problem should be promulgated and distributed by means of public education programs. Physicians who treat black patients also need to be encouraged to be more aggressive in their efforts to detect patients at risk and to initiate therapy early on in the course of CVD in this sub-population.

Introduction:

Cardiovascular disease (CVD) has long been considered a disorder which principally affects men in our society; consideration of the occurrence of heart attacks in females, for example, has been largely an afterthought, and CVD has been regarded as "a man's disease". In the past few years, however, it has become increasingly obvious that this is not a problem limited to males, but that it occurs with even greater frequency in females. We now know that CVD is the cause of death more than any condition in women over the age of 50, including cancer[1] and in fact is responsible for more than a third of all deaths in women.[2] It is estimated that 480,000 women in the United States die from heart disease each year. This is more than the next *five* causes of death, including cancer. The ignorance about this condition is appalling. Among women, only 13 percent realized that heart disease is their greatest health problem, according to a 2003 survey conducted by the American Heart Association. In addition, a recent survey indicated that less than 1 in 5 doctors are aware that more women than men die of cardiovascular disease each year.

Although there is a relative dearth of information regarding CVD in all women, our knowledge base regarding CVD in African American (AA) women has not kept pace with the accumulation of data on white females. Thus, there is a deficit of information about the black subgroup and the prevalence of CVD despite the fact that black women have more risk factors for CVD than do white women.[3] Almost half of African American women (45 percent) have some type of CVD, compared with about one-third (32 percent) of white women. Age-adjusted death rates for heart disease in 2002 were significantly higher for black women (169.7 per 100,000) compared to white women (131.2 per 100,000). There is also a discrepancy in awareness between white and minority women; an American Heart Association survey in 2006 revealed that while 77 percent of Caucasian women knew that heart disease is the biggest killer of women, only 38 percent of African American and 34 percent of Hispanic women were aware of this.

The purpose of this paper is to review the subject of CVD in African American women and to focus upon four principal CVD categories: Coronary artery disease (CAD), hypertension, stroke, and congestive heart failure (CHF). The impact of gender and race on each of these entities will be examined in comparison to white women, and a determination will be made as to whether a different approach to the management of these disorders should be made based on ethnicity and sex.

Coronary Artery Disease

The traditional view has been that men have much more of a problem with CAD than women do. This perception is based on the belief that men are naturally more

susceptible to the disease, whereas women enjoy the benefits of hormonal protection. Gender differences in the occurrence of heart attacks have been noted, especially in the younger years of adult life. However, as each decade passes, the gap between prevalence rates for males and females progressively narrows to the point where there is essentially no difference by the seventh and eighth decades.[4] Thus, although heart attack rates in women lag behind that for men by approximately ten years in the early years of adult life, equivalency is achieved later.

Clinical features of CAD have also been shown to differ substantially between men and women. The Framingham Study[5] demonstrated that CAD presented much more frequently as myocardial infarction in men than in women (49 vs. 29 percent), but women developed angina pectoris more frequently than men (47 vs. 26 percent).

Risk factors for CAD such as dyslipidemia, hypertension, cigarette smoking, diabetes mellitus, family history, obesity, and sedentary lifestyle have about the same incidence in men and women. However, the effect that certain risk factors have is more adverse in women. For instance, the risk of developing CAD is much greater in diabetic women. Another risk factor with substantially greater impact on females is hypertriglyceridemia.[6]

African American women are especially affected by CAD in a negative manner. They have a higher mortality and morbidity than African American men and white women under the age of 55. In the age group 25-44, African American women have 2.5 times the coronary heart disease mortality risk of white women. The mortality rate from CAD for black women is about 69 percent higher than that for white women.[7] Overall, in 1995, the CAD death rate for African American males was 133.1 per 1000 compared to

124.4 per 1000 for white males, or 7 percent higher for black males. Comparative rates for black and white women were 81.6 and 60.3 per 1000, respectively, indicating a 35 percent higher mortality rate for black women over white women. A study at West Virginia University stated that, compared to the overall national death rate from CVD in women of 401 per 100,000, the rate for black women in New York City was the highest among all major racial groups at 587 per 100,000. Rates for white and Hispanic women were 559 and 320 per 100,000, respectively. Mississippi had the highest black female CVD death rate in the nation at 686 per 100,000. The heart attack event rate is more than twice as high for black women than for white women in the age group 65-74 years,[8] indicating that the impact of having a higher number of risk factors over time is more deleterious in black women. Despite a lower coronary artery disease prevalence in black women based on angiographic studies, mortality rates are higher in this group than in white women. This inverse relationship between angiographic evidence of CAD and CAD mortality represents what may be termed the paradox of CAD in African American women.[9] Post-infarction mortality is also higher than that for black men and white men and women.[10] It should be emphasized that first myocardial infarction occurs at an earlier age with an earlier death in African American women.

Certain risk factors are indeed more frequently seen in African American as compared to white women. There is a significantly higher incidence of hypertension and stroke in black women with myocardial infarction,[11] and other risk factors which occur more frequently in this group include physical inactivity, higher mean body mass index (BMI),[12] and greater consumption of cholesterol and saturated fat.[13] Cigarette smoking and obesity represent risks which have been documented to increase cardiovascular

disease in black women. Smoking negates the advantage against CAD induced by estrogen in pre-menopausal women.[14] Diabetes mellitus is of particular concern in black women as a risk factor; the death rate among diabetic blacks is 2.5 times higher than in diabetic whites,[15] and black women have a higher prevalence of this disease. Diabetes completely eliminates the pre-menopausal protection that women have against CAD, and this would appear to be more of a problem for African American women.

Access to preventive medical attention for CAD has been noted to be deficient for African American women. A classic example is the study performed by Schulman et al.[16] Eight actors were used, of whom 4 were black, 4 were white, 4 were male, 4 were female, and the age range was from younger to older. All had videotaped interviews which were presented to more than 700 predominately white male primary care physicians attending a medical conference. The doctors were asked which patients they would be likely to refer for cardiac catheterization, based on a suggestive CAD profile which all of the patients possessed. Univariate analysis of the physicians' responses revealed that both men (90.6 percent) and whites (90.6 percent) were more likely to be referred for cardiac catheterization than women (84.7 percent) and blacks (84.7 percent). A race-gender analysis also showed that black women in particular were referred for this diagnostic procedure 40 percent less often than white men. This study has been interpreted as demonstrating racial and gender bias against African American women by white male physicians regarding referral for a critical cardiovascular procedure designed to detect CAD. This has been identified as a major healthcare disparity.

The use of hormone or estrogen replacement therapy (HRT or ERT) has been investigated intensively in the past several years regarding their possible reduction of

CVD risk in post-menopausal women. Several clinical trials including the Postmenopausal Estrogen/Progestins Study (PEPI), the Estrogen Replacement and Atherosclerosis Study (ERA), and the Heart and Estrogen/Progestin Replacement Study (HERS) have been performed, producing results which did not show a mortality benefit derived from hormone use in post-menopausal women with CAD. In fact, the use of hormone replacement therapy may be detrimental from a cardiovascular standpoint. The Women's Health Initiative (WHI), a 15-year multi-million-dollar study involving 67,000 women that was sponsored by the National Institutes of Health NIH), was designed in part to answer the question of benefit or risk from the using HRT. One of the arms of the study was the investigation of the effects of two hormones, combined estrogen and progestin. That portion of the WHI study was stopped in 2002 when it was found that the combination was associated with increases in heart attacks, stroke, breast cancer, and blood clots.[17] The current wisdom is to use HRT only if necessary to treat or prevent osteoporosis and for severe menopausal symptoms on a short-term basis. These decisions should be guided by the patient's doctor. There is no indication that black women respond differently than white women to HRT/ERT regarding the impact on CVD risk.

Hypertension

Pre-menopausal women who are hypertensive have a CAD mortality risk which is ten times greater than normal.[18] In the United States there are more hypertensive women than there are men with high blood pressure,[19] and the prevalence of hypertension is greater among African American women than among white women. Specifically, the prevalence of hypertension in blacks twenty years of age or older is in excess of that for

the population of the nation as a whole. The percentages are 35.0 for black males and 34.2 for black females, compared to 24.4 for white males and 19.3 for white females.[20] Hypertension is the most important risk factor for stroke and is easily the most modifiable one. In addition, it is the largest contributor to CVD morbidity and mortality in blacks. Comparative death rates for hypertension per 100,000 population are 29.6 for black males (355 percent higher than for white males), and 21.7 for black females (352 percent higher than for white females). The third National Health and Nutrition Examination Survey (NHANES III) also found that blacks have a higher prevalence of severe or stage III hypertension compared to non-blacks.[21]

Several differences in the pathogenesis of hypertension have been documented to exist between blacks and whites.[22] African Americans are characterized by low-renin hypertension accompanied by salt sensitivity, e.g., poor toleration of salt-loading, and greater volume expansion as a consequence. These characteristics tend to make blacks less responsive to drugs which impact on the renin-angiotensin-aldosterone system (RAAS) such as angiotensin-converting enzyme (ACE) inhibitors and beta-blockers in the treatment of hypertension, and relatively more responsive to medications which decrease plasma volume, such as diuretics. Their salt sensitivity also renders them more susceptible to the hypertensive effects of a high-salt diet. It is estimated that over 70 percent of African Americans have low-renin hypertension as compared to about half of whites. Although more than 90 percent of blacks have essential, or primary, hypertension, the discovery of a high renin level in a black patient, for instance, an elderly African American female, is so unusual that it strongly suggests a secondary cause for the blood pressure elevation. Black patients also tend to be more responsive to dihydropyridine

calcium-channel blockers (CCBs) and alpha-1 blockers. However, there are some mitigating factors. For instance, although ACE inhibitors and beta-blockers may not be as effective as other drugs when used as monotherapy in blacks, they do have an antihypertensive result similar to that seen in whites when these drugs are administered in combination with diuretics. In addition, many black patients who do not respond to monotherapy treatment with these drugs used in conventional doses may respond to higher doses, although there is a risk of more side-effects. ACE inhibitors are also indicated in the treatment of congestive heart failure and for the deadly combination of hypertension and diabetes, especially if proteinuria is present. Other pathophysiological characteristics which are different between hypertensive blacks and whites are altered vascular reactivity, increased sodium retention, increased potassium excretion, and decreased kallikrein excretion seen in blacks, as well as more nephrosclerosis. Decreases in vasodilatory substances in blacks such as kinins, prostaglandins, and dopamine are also seen. Black hypertensives have also been noted to have increased intracellular sodium and calcium concentration, decreased membrane sodium transport, and decreased red-cell sodium-potassium transport activity. These changes are believed to render the African American patient more prone to vascular, renal and circulatory alterations which result in elevated blood pressure.

Complications of hypertension have an earlier age of onset and a later age of detection in blacks than in their white counterparts. The principal complications are CAD, stroke, left ventricular hypertrophy, end-stage renal disease, and congestive heart failure. Because of these facts, it is important to treat hypertension in blacks more aggressively, e.g., early, thoroughly, and with multiple drugs as necessary. In addition,

non-pharmacological measures such as diet, attention to obesity, increased physical exercise, and avoidance of excess alcohol intake are essential components of a well-rounded therapeutic approach to the black hypertensive.

Stroke

Stroke is the third leading cause of death in the United States after coronary heart disease and cancer. There are about 500,000 strokes each year of which 150,000 are fatal. Stroke is also a major cause of physical impairment and the cost of acute and chronic care exceeds $30 billion a year in this country. A so-called "stroke belt" exists in the Southeastern part of the country, where almost 60 percent of the African American population resides.[23] Although stroke is generally thought of as a disorder primarily affecting the elderly, it should be recognized that 28 percent of the victims are under age 65. African Americans have a stroke mortality which is twice that of whites.[24] Age-adjusted stroke mortality rates are 76 percent higher among African American than among white men, and 54 percent higher among African American than white women.[25] Although the rate of decline for stroke mortality has increased since the 1970s, there has been a recent slowdown in this decline. This has been especially true for African Americans, in whom stroke mortality is actually increasing.

Since it is very difficult to treat stroke once the process is initiated, much of the focus has been on primary prevention. Hypertension is the most powerful predictor of stroke and is found to be a factor in 70 percent of cases.[26] Control of hypertension therefore represents the best strategy to prevent stroke, and in fact a meta-analysis

showed that when all studies of the association between treatment to lower blood pressure and stroke were reviewed, there was a 42 percent reduction in the incidence of stroke and a 45 percent reduction in fatal stroke when the diastolic blood pressure was reduced by 5-6 mmHg.[27] In addition, the Systolic Hypertension in the Elderly Program (SHEP) demonstrated that a 36 percent decrease in stroke risk resulted from mean blood pressure reduction of 11/3.4 mmHg. This benefit was seen in all ages, races, and genders. These data and other information support the need for vigorous drug therapy of hypertension for the primary prevention of stroke. This is especially important for African American patients, particularly women.

Congestive Heart Failure

Congestive heart failure (CHF) is the only cardiovascular disease whose incidence is increasing. There are great differences between blacks and whites in the etiology of CHF. Hypertension is the principal precursor of CHF in African Americans, whereas ischemic heart disease more commonly precedes CHF in whites. Mortality due to heart failure is about 2.5 times higher in blacks than in whites less than 65 years of age. Additionally, in 1990 the age-adjusted death rate for CHF among patients older than 65 years of age was 143.9 for black men compared with 117.8 for white men, and 113.4 for black women compared with 97.5 for white women.[28]

In a study of racial differences in heart failure, Afzal et al[29] prospectively analyzed 163 consecutive patients admitted to Henry Ford Hospital in Detroit, Michigan with a diagnosis of CHF. They found that compared with whites, blacks were younger in

age (mean age 63.8 vs. 70.8, p=0.0003), and had a higher prevalence of hypertension (86 vs. 66 percent, p=0.0004), left ventricular hypertrophy (24 vs. 8 percent, p=0.02), ejection fraction <40 percent (64 vs. 43 percent, p=0.03), and readmission rate (33 vs. 18 percent, p=0.05). Whites had a higher prevalence of atrial fibrillation (42 vs. 21 percent, p=0.006), and more frequently followed up with their cardiologists as outpatients (58 vs. 39 percent, p=0.04). The investigators concluded that significant racial differences exist in patients with heart failure regarding age, incidence, etiology, left ventricular hypertrophy, left ventricular function, and clinical follow-up.

Conclusion:

It should be obvious from the foregoing information that African Americans, and African American women in particular, possess special cardiovascular disease characteristics. Despite a relative paucity of data and the fact that only a small number of studies have been performed, there is enough evidence to indicate the need for special attention to be given to the cardiovascular problems of the black woman. This means that the approach to the black woman patient must be tailored to her uniqueness, and that clinicians must understand and appreciate the fact that she cannot be treated and managed in the same manner as white women and men or even black men. As we advance into the new millennium, it is expected that new and improved approaches to the treatment of cardiovascular disease in the African American woman will lead to improved health and longer survival. However, this will not occur unless clinicians are better educated about the special nature of their African American female patients, and until those very patients become better informed about the risks that they face.

Finally, it should be acknowledged that a number of outstanding organizations have banded together to work with federal legislators to pass the Heart for Women Act (s.573/H.R.1014) which was sponsored in 2006 by Senators Debbie Stebanow (D-MI) and Lisa Murkowski (R-AK) and Representatives Lois Capps (D-CA) and Barbara Cubin (R-WY). This bipartisan bill would improve the prevention, diagnosis, and treatment of heart disease, stroke, and other cardiovascular conditions in women by educating both women and healthcare providers about the most effective options for women. The member organizations of the coalition are the American Heart Association, the Society for Women's Health Research, the Association of Black Cardiologists, and WomenHeart. It is hoped that healthcare disparities and healthcare reform will continue to be vital issues and that more emphasis will be placed on cardiovascular disease in African American women.

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