

REDUCED PREVALENCE OF ATRIAL FIBRILLATION IN BLACK PATIENTS COMPARED WITH WHITE PATIENTS ATTENDING AN URBAN HOSPITAL: AN ELECTROCARDIOGRAPHIC STUDY

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Electrocardiographic differences occur between African-American and white persons. The cardiac rhythms of 2123 African-American and white hospital patients from 20 through 99 years of age were studied in a consecutive manner. The prevalence of atrial fibrillation increases dramatically with advancing age in both African-American and white patients. The prevalence of atrial fibrillation begins to increase at age 60 years and continues to increase through the 10th decade of life, although the rate of rise of the prevalence of atrial fibrillation is less in African-American patients compared with white patients. The cause of the reduced prevalence of atrial fibrillation in African-American patients remains unexplained. Atrial fibrillation occurs in 2.5% of African-American patients compared with 7.8% of white patients attending an urban hospital. There is little difference in the prevalence of atrial fibrillation between men and women. Atrial fibrillation occurs nearly seven times more often than does atrial flutter. (*J Natl Med Assoc.* 2002;94:204-208.)

Key words: atrial fibrillation and flutter ♦ racial and gender differences

Earlier studies have demonstrated electrocardiographic differences between African-American and white persons,¹⁻³ but little data are available on racial and gender differences of cardiac rhythms. It is the purpose of this study to present data on the prevalence of atrial fi-

brillation and flutter in African-American and white patients attending an urban hospital in Atlanta, Georgia. Piedmont Hospital is a community, not-for-profit 500-bed acute tertiary care facility offering medical, surgical, and diagnostic services, including invasive cardiovascular studies and treatment and cardiovascular surgery. The hospital serves a metropolitan area of 4.1 million people.

METHODS AND DEFINITIONS

The study group consisted of a total of 2,123 patients, including 1201 white patients and 922 African-American patients, attending Piedmont Hospital as inpatients, outpatients, and at

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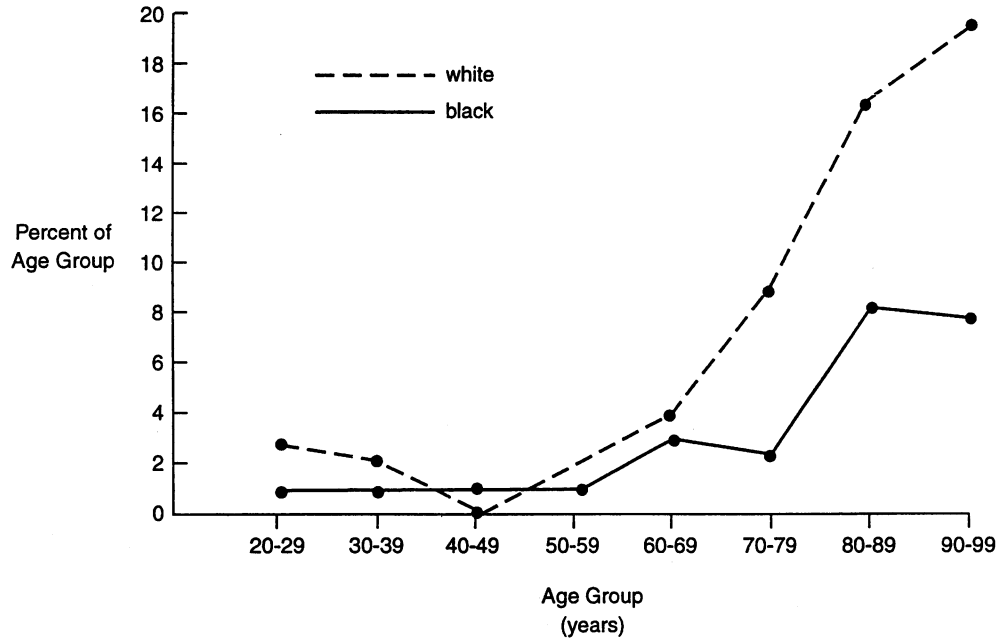


Figure 1. The prevalence of atrial fibrillation in various ages in white and African-American patients. The increasing prevalence of atrial fibrillation begins at 60 years of age and continues through the 10th decade of life, but there is a smaller increase in African-American patients to 7.0% in the 10th decade of life compared with 19.3% for white patients. White, white patients; black, African-American patients.

the emergency department. These patients had an electrocardiogram recorded as part of their hospital examination, and they were divided according to patient age into 10-year groups, beginning at the 3rd decade of life and extending through the 10th decade of life. Electrocardiograms recorded between October 28, 1996 and June 30, 1998 were retrieved from the files of the Carter Smith, Sr. ECG Laboratory of the hospital in groups of 95 to 250 electrocardiograms for each age group of both white and African-American patients. The number of patients in each age group varied because of differing numbers of patients in the study age groups attending the hospital, but averaged 150 for white patients (range: 104–181) and 115 for African-American patients (range: 43–167). Each group of electrocardiograms was studied in a consecutive manner. When a series of electrocardiograms was recorded on a patient, the earliest electrocardiogram was chosen as the one of study. Cardiac rhythm was noted for each patient. Atrial fibrillation and

atrial flutter included both paroxysmal and sustained arrhythmias. All electrocardiograms were recorded using computer programs of the Marquette Electronics MAC 8 Resting ECG Analysis system. All calculations of the prevalence of atrial fibrillation and atrial flutter were rounded off to the nearest one-tenth of a percent. The results of the present study are compared with data from population-based surveys.^{4–8}

Statistical Analysis

The χ^2 test was used to compare differences in the prevalence of atrial fibrillation in the two racial groups. A *p* value of < 0.05 was considered statistically significant.

RESULTS

Figure 1 and Table 1 demonstrate the rising prevalence of atrial fibrillation with advancing age in both African-American and white patients. The rise begins at 60 years of age, but the prevalence for white patients rises at a

Table 1. Prevalence of Atrial Fibrillation by Age and Race

Age Groups (Years)	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99	Totals
Number of patients in age group	223	217	296	296	284	295	288	224	2123
Race: white/african-american	117/106	104/113	129/167	153/143	167/117	172/123	178/110	181/43	1201/922
Number of patients with atrial fibrillation	3/1	2/1	0/2	3/1	7/3	16/3	28/9	35/3	94/23
% of group	2.6/0.9	1.9/0.9	-/1.2	2.0/0.7	4.2/2.6	9.3/2.4	15.7/8.2	19.3/7.0	7.8/2.5*

**p* < 0.01.

steeper rate, reaching 19.3% in the 10th decade of life. In contrast, the rate of rise of atrial fibrillation in African-American patients is slower and reaches a prevalence of 7.0% in the 10th decade of life. In the entire study group, atrial fibrillation occurred in 117 (5.5%) of 2123 patients. Of 1,201 white patients, 94 (7.8%) had atrial fibrillation compared with 23 (2.5%) of the 922 African-American patients (*p* = <0.01).

Prevalence of Atrial Fibrillation in Men and Women

In the entire study group, there were 950 men and 1,173 women. Atrial fibrillation occurred in 53 (5.6%) men and 64 (5.5%) women. Of 1201 white patients in this study, 570 were men and 631 were women. Atrial fibrillation occurred in 42 (7.4%) men and in 52 (8.2%) women. Of 922 African-American patients in this study, 380 were men and 542 were women. Atrial fibrillation occurred in 11 (2.9%) men and in 12 (2.2%) women.

Prevalence of Atrial Flutter in the Study

Atrial flutter occurred in 17 (0.8%) of 2,123 patients in the study group, in 11 (0.9%) of 1201 white patients, 6 (0.7%) of 922 African-American patients, 5 (0.9%) of 570 white men, 6 (1.0%) of 631 white women, 5 (1.3%) of 380 African-American men, and 1 (0.2%) of 542 African-American women.

Table 2 compares the prevalence of atrial fibrillation in the present study by age and race with pooled data from population-based surveys reported between 1989 and 1994.⁴⁻⁸ The Framingham (number of subjects: 5,070), Western Australia (1,770), Rochester, Minnesota (2,122), and Cardiovascular Health (5,201) studies totaled 14,163 subjects who were predominantly white (racial composition of population-based studies: Framingham, largely white; Western Australia, not stated; Rochester, 98% white; Cardiovascular Health, 94.7% white). In these population-based surveys, the prevalence of atrial fibrillation increases dramatically in the elderly beginning at age 60 years. In the present urban hospital study, the prevalence of

Table 2. Prevalence of Atrial Fibrillation in an Urban Hospital by Age and Race Compared with Population-Based Surveys

Age Group (Years)	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-99
Urban Hospital Study								
Race: white/black % of group	2.6/0.9	1.9/0.9	-/1.2	2.0/0.7	4.2/2.6	9.3/2.4	15.7/8.2	19.3/7.0
Population Based Studies*								
Race: largely white % of group	-	-	0.2	0.6	2.2	6.4	9.3	-

*Derived from pooled data of population-based surveys of 14,163 subjects, largely white, from the Framingham, Western Australia, Rochester, and Cardiovascular Health studies.⁴⁻⁸

atrial fibrillation also increases significantly with advancing age and is greater in white patients compared with the prevalence of atrial fibrillation of subjects in population-based surveys. By way of contrast, in African-American patients attending an urban hospital, the prevalence of atrial fibrillation at each age level is similar to or less than the prevalence of atrial fibrillation of subjects in population-based surveys.

DISCUSSION

The prevalence of atrial fibrillation is significantly less in African-American patients compared with white patients attending an urban hospital. The difference in the prevalence of atrial fibrillation between African-American and white patients begins at 60 years of age and increases progressively through the 10th decade of life. The cause of this racial difference is not known. The reduced prevalence of atrial fibrillation in African-American patients is of significant medical importance and may result in a reduced likelihood of thromboembolic stroke and in steadiness of hemodynamics.^{6,9} In a study of 163 hospitalized patients with congestive heart failure, 21% of African-American patients whose mean age was 64 years had atrial fibrillation compared with 42% of white patients whose mean age was 71 years.¹⁰ In adult subjects age 65 years or older, African Americans have less than one half the age-adjusted risk of developing atrial fibrillation compared with whites.^{11,12} The potential beneficial effects of reduced prevalence of atrial fibrillation in African-American patients found in the present and earlier studies are in sharp contrast to the known heavy burden of cardiovascular diseases borne by African-American patients. In prior studies, African-American patients have been found to have a greater mortality from cardiovascular diseases, more frequent hypertension, salt sensitivity, congestive heart failure, and stroke compared with white patients.¹³ The most common risk factors associated with atrial fibrillation are hypertensive cardiovascular disease, coronary artery disease, rheumatic heart

disease, congestive heart failure of any etiology, and hyperthyroidism. A dilated left atrium, advancing age, and alterations in autonomic tone are also related to the development of atrial fibrillation.¹⁴ A closely coupled premature atrial complex followed by a salvo of atrial tachycardia is the most common mechanism of initiation of atrial fibrillation.^{15,16} A recent study suggests that the above mechanism originates in the pulmonary veins near the left atrium in as many as 90% of cases.¹⁷ Shortened P wave duration of the electrocardiogram has indicated a reduced likelihood of developing premature atrial complexes and atrial fibrillation,^{18,19} but whether racial differences occur in the frequency of premature atrial complexes or in the duration of P waves of the electrocardiogram is not known. Especially in the elderly, atrial fibrillation is a major risk factor for embolic stroke, with an estimated 75,000 occurring each year. Patients with paroxysmal atrial fibrillation have a stroke rate of 3.2% per year, similar to the stroke rate of 3.3% of patients with sustained atrial fibrillation.²⁰ There are no studies limited to African-American patients of the frequency of embolic stroke occurrence in this racial group. There is little difference in the prevalence of atrial fibrillation between men and women in both white and African-American patients in this study. The prevalence of atrial fibrillation is higher in white patients in the current study compared with the prevalence of atrial fibrillation in pooled data of subjects in population-based surveys. This difference is expected because most patients attending an urban hospital are ill, whereas the majority of subjects in population-based surveys are not ill. However, the prevalence of atrial fibrillation in African-American patients 40 through 89 years of age attending an urban hospital is so low as to be virtually the same as that reported in subjects in population-based surveys in the same age groups (Table 2).

More studies are needed of electrocardiographic differences of cardiac rhythms between African-American patients, white patients, and other racial groups.

SUMMARY

- 1) In an urban hospital setting, atrial fibrillation is less common in older African-American patients compared with older white patients in the same decade of life.
- 2) In the entire study group, atrial fibrillation is more than three times as prevalent in white patients compared with African-American patients, occurring in 7.8% of white patients and in 2.5% of African-American patients.
- 3) There is little difference in the prevalence of atrial fibrillation between men and women. Atrial fibrillation occurred in 7.4% of white men, 8.2% of white women, 2.9% of African-American men, and in 2.2% of African-American women.
- 4) In the study group, atrial fibrillation occurred nearly seven times more often than did atrial flutter. Atrial fibrillation occurred in 117 patients and atrial flutter in 17 patients.

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