More Frequent Diagnosis of Acute Myocardial Infarction among Navajo Indians

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Abstract: In an earlier study, we failed to confirm a clinical impression that the incidence of acute myocardial infarction (AMI) was increasing in Navajo men. Extending our data collection an additional three years, through 1986, we observed that the attack rate in men more than doubled and there was a gradual increase among women. Most Navajos who sustain AMI are hypertensive (51 per cent), diabetic (50 per cent) or both (31 per cent), but few smoke cigarettes. (*Am J Public Health* 1988; 78:1351–1352.)

Introduction

The low prevalence of ischemic heart disease among Navajo indians has been thoroughly documented.[1–7] Indian Health Service (IHS) data from as recently as 1981–83 show an age-adjusted mortality rate of 30.5 per 100,000 persons for ischemic heart disease in the Navajo area. This compares with a mortality rate in 1982 of 139.3 per 100,000 for the general US population.[7] As part of a case-control study of cardiovascular risk factors, we identified all Navajo diagnosed in IHS facilities as having suffered an AMI during an eight-year period (1976–83). Despite some published evidence that AMI was increasing in frequency among Southwestern Indians,[8] we were unable to demonstrate such a trend in Navajo men, although we did observe it among older Navajo women.[6]

It is a reasonable hypothesis that changes in lifestyle and the pattern of cardiovascular risk factors will affect the occurrence of AMI among the Navajo. We decided to extend our observations for another three years, using the same methods and diagnostic criteria, to ascertain whether we could confirm the clinical impression that AMI was increasing in frequency among Navajo men.

Methods

The US Public Health Service operates six hospitals and two major outpatient clinics in and around the Navajo Indian Reservation in northeast Arizona and northwest New Mexico. We reviewed hospital charts of Navajos discharged with the diagnosis of AMI during a three-year period, 1984–86. The method of data collection was the same as that described in our earlier case control study of Navajos with diagnosed AMI from 1976–83.[6]

Confirmation of AMI required: 1) serial electrocardiagraphic changes of ST segment elevation with later inversion of T waves, evolving through the appearance of Q-waves, 0.04 seconds or greater in duration; or 2) EKG changes of ST elevation and T inversion, associated with serial elevations of creatinine phosphokinase in blood. The criteria were identical with those used in the previous study.[6] We also searched charts for clincial diagnoses of hypertension or diabetes mellitus; any written indication that the patient smoked cigarettes; and the clinical outcome. Our population denominators for each age and sex group were taken from estimates developed by the Navajo Area Indian Health Service using a 1980 base population and assuming an annual growth rate of 2.9 per cent to estimate base populations for the three time periods: 1976–79, 1980–83, and 1984–86.

Results

During the three-year period (1984–86) 157 Navajos were discharged with diagnoses of acute myocardial infarction and confirmed by our criteria on chart review. The annual incidence of diagnosed AMI was 1.1 per 1,000 persons age 30 years or more, greater than twice that observed in our previous survey (0.5 per 1,000). Of the total patients, 41 (26 per cent) were women, the same proportion as identified earlier (38 patients, 26 per cent). Table 1 presents hospitalization rates per 1,000 persons for AMI by age and sex in three time periods. There is an abrupt increase in the occurrence of diagnosed AMI among men of all age groups, and a more gradual increase among women, primarily in the 65+ years age group.

Thirty-four deaths occurred within one month of the cardiac event and were thought to result from AMI. This 18.5% per cent fatality rate compares with a 24 per cent fatality rate in the earlier study.[6] Charted prevalence of hypertension was 28 per cent for 1976–79, 42 per cent for 1980–83, and 51 per cent for 1984–86. Diabetes was noted in 34 per cent, 30 per cent, and 50 per cent; and cigarette smoking in 28 per cent, 13 per cent, and 6 per cent of AMI patients in the three time periods. In 1984–86, 31 per cent were both diabetic and hypertensive.

Discussion

We found a tripling of diagnosed AMI in younger men and a doubling in older men, with an overall rate ratio of 2.43, using 1976–79 as a base. How can these findings be explained? We used similar sources, diagnostic criteria, and data collection techniques in all three surveys. The present observations are unlikely to be explained by changes in the quality or availability of health care. Although one new hospital replaced on outpatient clinic at the same site midway during the 11-year period, patients from that service area constituted about 11 per cent of AMI cases from 1976–83 and about 10 per cent from 1984–86, indicating that the availability of this new facility did not lead to a disproportionate increase in AMI diagnoses.

The most likely explanation is that a rapid increase in diagnosed AMI reflects the cumulative influence of changed risk factors on various cohorts of Navajo people. Cigarette smoking remains an uncommon practice and, in fact, the proportion of AMI patients who are noted to be smokers has

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TABLE 1—Hospitalization Rates per 1,000 Persons for AMI among Navajos by Age Group and Sex, Three Time Periods

	Men			Women		
Age Groups (years)	1976–79	1980–83	1984–86	1976–79	1980–83	1984–86
35–44	0.1	0.1	0.4	0.0	0.1	0.0
45–54	0.7	0.5	1.7	0.0	0.3	0.5
55–64	0.9	1.3	2.6	0.1	0.8	0.7
65+	2.4	2.2	5.0	0.6	1.8	2.3
Age-Adjusted rates per 1,000 persons age 35 and over	0.84	0.79	2.03	0.12	0.54	0.62
Rate Ratios*	1.0	1.04	2.43	1.00	4.35	4.96
(95% confidence intervals)		(0.60,1.82)	(1.73,3.42)		(2.26,8.39)	(2.59,9.51)

*Weighted age adjusted rate ratios

declined in recent years. Hypertension, on the other hand, appears to have dramatically increased in prevalence over the last 20 years among Navajos in general,[5,9,10] and this is reflected in the higher percentage of AMI patients who were hypertensive. The contribution of hypertension to atherogenesis may only now be becoming clinically evident after a 10- to 20- year latent period. Likewise, the prevalence of diabetes has increased in the last generation and may now be contributing to excess coronary artery disease.[11] These findings suggest that an even greater increase in ischemic heart disease may occur among the Navajo in the next generation as the influence of hypertension and diabetes on vascular disease takes its toll.

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Health, United States, 1987: Report to Congress, the President

The United States Public Health Service has transmitted its 12th annual report on the status of the nation's health to the Congress and the President. *Health, United States, 1987* contains numerous tables and details covering all aspects of health, from infant mortality rates and death rates from various diseases to dental health care and air pollution. A chartbook at the front of the report illustrates trends in such areas as heart disease, cancer, stroke, suicide, maternal mortality, and birth rates.

The report, DHHS Pub. No. (PHS) 88-1232, issued March 1988, is for sale by the US Government Printing Office, Washington, DC 20402.