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American Indian Women and Cardiovascular Disease:

Response Behaviors to Chest Pain

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Abstract

Cardiovascular disease (CVD) is currently the number one killer of American women. Consequently, CVD is a concern for all women, including ethnic women. However, little is known about CVD behaviors and responses to CVD symptomology among minority women, especially American Indian women. Response behaviors to chest pain require important actions. This article examines response behaviors to chest pain in a group of American Indian women participants of the Inter-Tribal Heart Project. In 1992 to 1994, 866 American Indian women, aged 22 years and older, participated in face-to-face interviews to answer survey questions on multiple areas related to cardiovascular disease on 3 rural reservations in Minnesota and Wisconsin. A secondary data analysis was conducted on selected variables including demographic characteristics, healthcare access, rating of health status, personal and family history of cardiovascular disease, and action in response to crushing chest pain that lasted longer than 15 minutes. Research findings report that 68% of women would actively seek healthcare immediately if experiencing crushing chest pain that lasted longer than 15 minutes. However, 264 women (32%) would take a passive action to crushing chest pain, with 23% reporting they would sit down and wait until it passed. Analysis revealed women reporting a passive response were younger in age (under age 45) and had less education (less than a high school education). These findings have implications for nurses and other healthcare providers working in rural, geographically isolated Indian reservations. How to present CVD education in a culturally appropriate manner remains a challenge.

Keywords

American Indian women; cardiovascular disease; chest pain; culture; Inter-Tribal Heart Project

Cardiovascular disease (CVD) is currently the number one killer of American women.[1,2] Consequently, CVD is a concern for all women, including ethnic women.[3] Cardiovascular disease among men is well documented and studied. Indeed, CVD was previously considered a “man’s disease.” Researchers and providers often ignored the subject matter among women.[4] Awareness about CVD has increased in the last decade among both men and women. While some women may be knowledgeable that CVD is their number one

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The people who agreed to participate in the Inter-Tribal Heart Project and the local tribal governments made this work possible.

killer, and may be able to identify risk factors and symptoms surrounding CVD and acute myocardial infarction, little is known about CVD responses and behaviors among ethnic women, especially American Indian women. This information is important in relation to decreasing existing health disparities.

Recently, the National Institute of Health posted a campaign on women and heart attack signs on their Web site via the National Heart, Lung, and Blood Institute.[5] The usual symptom of pain or discomfort in the center of the chest is cited as a first indicator of a heart attack "warning" for both men and women. Response behaviors to chest pain, therefore, are potentially important actions for all women. Accordingly, a study was conducted to examine response behaviors to chest pain among American Indian women participants of a major research study, the Inter-Tribal Heart Project.

Background

Although CVD is the number one killer of American Indians,[1,6] the mortality rates for CVD varies considerably among tribes in the United States.[6,7] The Bemidji Indian Health Service (IHS) Area, which includes the states of Indiana, Michigan, Minnesota, and Wisconsin, has the highest CVD mortality rates of all Indian Health Service areas at 287 per 100,000 (age adjusted, and adjusted to compensate for miscoding of Indian race on death certificate).[6]

To examine this issue, the Centers for Disease Control and Prevention (CDC) and the Indian Health Service initiated a collaborative effort to improve the cardiovascular health of American Indians residing in the Bemidji Area. Thirty-two American Indian Bemidji Area tribes were invited to participate in a project to design and implement comprehensive assessment utilizing survey tools to collect data on multiple factors related to CVD and to create CVD interventions based upon this information. Three tribes met the screening criteria and were selected to participate in the Inter-Tribal Heart Project. These tribes were the (1) Minnesota Red Lake Ojibwa (8677 members), (2) Minnesota White Earth Ojibwa (20,496 members), and (3) Wisconsin Menominee Tribe (7424 members).

To date, another important study, the Strong Heart Study, provides the most comprehensive data on CVD in the American Indian population. Conducted from 1984 through 1992, the study used a retrospective cohort design and a cross-sectional survey of CVD mortality, prevalence, and risk-factor assessment. The study population consisted of 4549 American Indians from 12 tribes in 3 geographic areas in South Dakota and North Dakota, southeastern Oklahoma, and Arizona.[8] Findings demonstrated that the prevalence of risk factors was not similar in the 3 tribal regions.[7] According to the US Department of Health and Human Services,[9] the 1997 Behavioral Risk Factor Surveillance System, an ongoing state-based random-digit-dialed telephone survey of the noninstitutionalized US population, also discovered that CVD risk factors and death rates are not distributed uniformly in the American Indian/Alaska Native population.

The Strong Heart study found that mortality rates from CVD were 19% lower than the rate for the US population.[10] However, upon further examination of a longitudinal cohort, Howard et al[11] found that rates of CVD may be higher in American Indians than other US populations, that CVD may more often be fatal, and that CVD rates are rising, most likely because of the high prevalence of diabetes with changing nutrition and exercise patterns.[10] The Navajo Health and Nutrition study surveyed 788 members, aged 20 to 91 years, of the Navajo tribe (303 men and 485 women) in 1991–1992 and found that coronary heart disease risk factors were common.[12]

Limited research is available on American Indian (Native American, Native, or US indigenous people are terms used interchangeably) women and CVD. Casper et al[2] reported

that in Minnesota, where the Red Lake and White Earth Reservations are located, American Indian and Alaska Native women had the highest age-adjusted heart disease death rate (472 per 100,000) for women aged 35 years and older. This rate is compared to 284 for all women, 339 for Black women, 282 for White women, 138 for Hispanic, and 99 for Asian and Pacific Islander women. In Wisconsin, where the Menominee Reservation is located, the average annual age-adjusted heart disease death rate for American Indian and Alaska Native women aged 35 years and older was the second highest in the state (445/100,000 compared to 354 for all women, 491 for Black, 350 for White, 117 for Hispanic, and 154 for Asian and Pacific Islander women). Even though these are alarming statistics, a dearth of literature was found describing specific characteristics of American Indian women and CVD, or how and if women in this particular population obtain information on health areas such as CVD.

Methods

The authors utilized a subset of all women participants of the Inter-Tribal Heart Project and conducted a secondary analysis on their response behaviors to chest pain. The original data consisted of an age stratified, random sample of 1376 adult American Indian participants (aged 22 years and older) from 3 reservations. Sixty-three percent of the participants were women (n = 866) and 37% were men (n = 510). This research targets the 866 women participants from the 3 participating rural, geographically isolated reservations.

A comprehensive survey was administered during a face-to-face interview conducted by an Inter-Tribal Heart Project staff. The length of the interview was 1 hour to 1½ hours held during 1992 to 1994. Topic areas included medical history, family history, biological factors (eg, blood pressures, weights, cholesterol levels), psychosocial factors (eg, stress), behavioral factors (eg, diet, physical activity levels, and tobacco use), and individual responses to chest pain. Human subject approval for the secondary data analysis was obtained from the University of Minnesota Institutional Review Board (IRB) for the secondary analysis. Initial IRB study approval was obtained from the Indian Health Service, the Center for Disease Control and Prevention, and the 3 tribal governments.

Secondary Data Statistical Analysis

Descriptive statistics are presented as means and standard deviations for normally distributed interval data, medians and ranges for ordinal or non-normally distributed interval data, and frequencies for categorical data. Comparisons between active and passive responders to chest pain were accomplished using t test for interval data or a Mann-Whitney U test if the data were not normally distributed. The Mann- Whitney U test was also used to compare ordinal data. Categorical data were compared between groups using a chi-square test of association. Comparisons were considered significant at $P < .05$.

Findings

Demographic Characteristics

Table 1 reports the demographic characteristics of the study sample. The mean age of the participants was 45.8. Of the participants, 28.5% had less than a high school education and 33.2% were high school graduates. The remainder, 38%, either had graduated from college or had some technical or college experience. Sixty-two percent were either employed outside the home or inside their home, and 37.8% were not employed. Forty-five percent of female participants reported an annual household income of less than $15,000, 26% reported an income between $15,000 and $25,000, and 19% reported a household annual income greater than $25,000. The majority of women (84.7%) reported having a telephone in their homes.

Healthcare Access

The American Indian women in this study received healthcare from rural sources. One option is the Indian Health Service, which operates federal-funded or tribal outpatient clinics at each research site, as well as an Indian Health Service hospital at Red Lake. The Indian Health Service or tribal clinic provided healthcare to 87.6% of the women; the rest received healthcare from the following: (a) traditional healers (0.6%), (b) private physicians (5.3%); (c) non-IHS or nontribal healthcare facility (6.1%); and (d) hospital emergency rooms (0.1%). Because these reservations are in rural areas, the women were asked how many miles they lived from their healthcare facility of choice. Results varied: 66.2% were 10 miles from care, 17.8% lived 11 to 20 miles from where they sought healthcare, and 10.2% lived 21 to 30 miles from their regular healthcare facility. Therefore, 93.2% of the research participants lived less than 30 miles from where they received healthcare. Research participants were also asked whether there was a time in the last 2 years when they could not get healthcare: 12.9% reported there was a time(s) this occurred. Reasons included the waiting time was too long (49%); transportation problems kept them from seeking healthcare (11%); there was no one to take care of the children, travel time was too long, or they were unable to pay (3.6%); and they could not take time off from work (2.6%). See Table 2.

Health Status Rating

In the Inter-Tribal Heart study, participants were asked to rate their health status on a 5-point scale that scored responses as excellent, very good, good, fair, or poor. Ten percent self-evaluated their general health as excellent, 26% as very good, 39% as good, 20% fair, and 4% reported their general health was poor.

Personal and Family History of Heart Disease and Stroke

Personal as well as a family history of CVD may be a strong risk factor for future CVD. Thus, personal and family history of CVD was obtained from the women who participated in the study. Ninety-three percent reported that they had been told they had not had a heart attack; however, 13% said they had been told of other cardiovascular problems, and 3.6% had been told they had a stroke. Even though the majority of the women self-reported that they were never told they had a heart attack, other cardiovascular problems, or stroke, 49% of the women reported that a biological member of their family had been told they had had a heart attack and 26% of the women said that a biological family member had been told they had a stroke.

Crushing Chest Pain

Crushing chest pain may be an important indicator of impending or occurring heart attack. To help understand what action American Indian women take when they experience crushing chest pain, the Inter-Tribal Heart participants were asked: “What would you do if you experienced crushing pain in your chest that lasted longer than 15 minutes?” The majority of women (n = 583 or 68%) responded that they take a very active response and “would go to a medical facility right away” or would “call an ambulance.” The remainder (n = 264 or 32%) of women indicated a very passive response and responded that “they would sit down and wait until it passed” (23%), would “go to a medical facility when it becomes convenient” (3%), or “would continue what you are doing and hope it goes away” (2%). Two percent did not answer the question and 3% responded in the “other” category. Only 0.1% would go to a traditional healer. See Table 3.

Active Versus Passive Responses to Chest Pain

It is of great concern that 32% of American Indian women residing on reservations in Minnesota and Wisconsin would not seek healthcare immediately. Instead, they would reportedly take a passive stance (as opposed to an active stance: seeking immediate care) if experiencing crushing chest pain (which may be indicative of a heart attack) that lasted longer than 15 minutes. Clearly, a passive response may immediately compromise their health status, perhaps even their life. Whereas the active group of respondents purportedly are more amenable to seeking instantaneous healthcare when experiencing crushing chest pain, it is clear that both groups need attention in their response to chest pain.

The active group, which consists of 583 women, was compared to 264 women in the passive group in relation to variables of age, employment, education, median income, phone in the home, median health rating, miles from healthcare (median), inability to obtain healthcare, and personal and family history of heart disease (see Table 4). Analysis shows a significant difference among the passive group in relation to younger age (less than 45 years) and less education (less than a high school graduate). Thus, the challenge looms as to how to influence younger and less educated American Indian women about seeking healthcare in the event of crushing chest pain, which can be a serious indicator for heart attack or other health concerns.

Conclusion

According to Goforth Parker et al,[13] prevention of major disability from CVD involves early identification of signs of impending heart attack and stroke. Thus, this study is important for planning and developing health education related to CVD for nurses and healthcare providers who work in rural, isolated communities, particularly with the American Indian population. It is alarming that 32% of the American Indian women in this study stated they would delay seeking treatment if they experienced crushing chest pain by sitting down and wait for it to pass, continuing with what they are doing, and go to a medical facility when it became convenient. The women who reported a passive response to chest pain are younger and have less education than the women who reported an active response. The challenge is to design culturally appropriate messages and health education to which these women in particular can relate. Perhaps women put off seeking healthcare for crushing chest pain because they are not aware of the impending danger. However, it is noteworthy that 67% of the women in the Inter-Tribal Heart Study reported that they would seek medical care right away by calling an ambulance or going to a medical facility right away in the event of crushing chest pain. Thus, a strong point exists that shows the majority of women on these rural reservations indicate that they will seek appropriate healthcare. Accordingly, nurses and other healthcare providers must enthusiastically and assertively continue what they are doing in relation to providing information and health education on heart attack signs and symptoms.

The reservations studied are rural and isolated. Women in rural areas have additional conditions imposed by isolation, lack of resources in their communities, and poverty.[14] Widespread poverty is evident, in that 45% of the American Indian women participants reported an annual household income of less than $15,000 and 12.9% reported an instance in which they could not obtain healthcare in the last 2 years. These may be noteworthy factors in regards to obtaining appropriate CVD healthcare and health information.

In general, research reveals that the method rural women use to receive healthcare information is not specifically known, but it has been found that health-seeking behaviors of rural dwellers are affected by reliance on informal networks of family and friends for the diagnosis and treatment of illness.[15] Meischke et al[16] found that women they surveyed in the

state of Washington received most of their information on acute myocardial infarction from the mass media, even though they evaluated the media as less useful, less clear, and making less of an impression than information received from healthcare providers. However, no studies were found that examined and highlighted how rural American Indian women access healthcare information for crushing chest pain that lasts longer than 15 minutes. This signifies an area requiring initial investigation.

As the health of the US ethnic minorities is improving, substantial disparities continue to exist. Although attention has been focused on eliminating health disparities, ethnic minority people continue to receive a lower quality of healthcare than the majority population, regardless of income.[17] Perhaps, lower quality of healthcare and less-examined factors such as racism, discrimination, and sexism, which are imbedded in our healthcare systems are not welcoming to poor, rural American Indian women. In any event, more research is needed surrounding health disparities and means of resolution.

Crushing chest pain is not the only symptom of heart attack. Recent literature reveals that women younger than 55 years or who are minorities tend to be misdiagnosed in the emergency room because of absence of chest pain.[18] In fact, these women more commonly present with shortness of breath or other chest pain equivalents, such as nausea, indigestion, diaphoresis, and syncope[5]; or vague symptoms including activity intolerance, fatigue, or a general sense of not feeling well.[19] The National Heart, Lung, and Blood Institute reinforces this fact and emphasizes that women may not have the typical crushing chest pain when having a myocardial infarction of any type. The challenge is how to get factual, practical, and culturally appropriate information out to rural women, as those who participated in the Inter-Tribal Heart Project. Specifically, younger and less educated women are a particular population to target. In this way, American Indian women can obtain up-to-date information that is based upon the reality of their world and culture.

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TABLE 1

Demographic Characteristics of Women Who Participated in the Inter-Tribal Heart Project (N = 866)

Age (mean)	45.8 (13.0)
Education	
Less than 8th grade	6.9%
Some high school	21.6%
High school graduate	33.2%
Some technical school	6.3%
Technical school graduate	10.4%
Some college	15.2%
College graduate	5.2%
Post graduation or professional degree	0.8%
Employment	
Yes, outside home	56.3%
Yes, inside home	5.7%
No	37.8%
Annual household income	
Less than $5,000	8.2%
$5,000–$10,000	21.8%
$10,000–$ 15,000	14.9%
$15,000–$20,000	15.4%
$20,000–$25,000	10.7%
$25,000–$30,000	7%
Greater than $30,000	12%
Don’t know	8.2
Refused	2%
Home telephone	
Yes	84.7%
No	15.3%

TABLE 2

Healthcare Access of Inter-Tribal Heart Project Women Participants

Place where participants usually receive healthcare	
Indian Health Service (IHS) or tribal clinic	87.6%
Traditional ways or healer	0.6%
Private physician	5.3%
Non-IHS or nontribal facility	6.1%
Hospital emergency room	0.1%
Miles from healthcare facility	
10 or less	66.2%
11–20	17.8%
21–30	10.2%
More than 31	6.8%
In last 2 years, couldn't get healthcare	
Yes	12.9%
No	87%
Main reasons why participants couldn't get healthcare	
Waiting time to see doctor is too long	49%
Transportation problems	11%
No one to take care of kids	3.6%
Travel time too long	3.6%
Unable to pay	3.6%
Can't take time off from work	2.8%

TABLE 3

Question and Answers Related to Chest Pain That Lasted Longer Than 15 Minutes

What Would You Do if You Experienced Crushing Pain in Your Chest That Lasted Longer Than 15 Minutes?	No. of Women	Percentage
Sit down and wait until it passed	198	23.3%
Continue what you are doing and hope it goes away	18	2.1%
Call an ambulance	202	23.8%
Go to a traditional healer	1	0.1%
Go to a medical facility right away	382	45.0%
Go to a medical facility when it becomes convenient	27	3.2%
Other	22	2.6%
Did not answer	16	2.0%

TABLE 4

Active and Passive Responses to Crushing Chest Pain That Lasted Longer Than 15 Minutes

	Active Response (*n* = 583)	Passive Response (*n* = 264)	*p*
Age*	46.7 (12.9)	43.4(12.7)	.001
Employed†	169 (63.5%)	360 (61.9%)	.64
Post high school education†	240 (41.5%)	86 (32.3%)	.01
Median Income‡	$15–$20,000	$10–$15,000	.07
Has phone†	497 (85.4%)	220 (82.7%)	.32
Median health rating‡	3 (1–5)	3 (1–5)	.22
1 = excellent, 5 = poor			
Miles from healthcare (median)‡	6 (1–260)	6 (1–300)	.71
Could not get medical care†	67 (11.5%)	42 (15.8%)	.08
Told had myocardial infarction†	39 (6.7%)	18(6.8%)	.95
Told had other heart problem†	74(13%)	36(14%)	.73
Family member had myocardial infarction†	290 (51.4%)	128 (50.6%)	.83
Family member had stroke†	82 (14.4%)	34(13.2%)	.64

*Independent *t* test.

†Chi-square test of association.

‡Mann-Whitney *U* test.