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Cancer Prevention and Control in American Indians/Alaska Natives

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The health of American Indians continues to be poor when compared to that of the general population. Three out of eight American Indians die before their forty-fifth birthday compared to only one out of eight other Americans [1]. Cancer has not always been a major public health problem for American Indians, and its occurrence in this special population has been studied this century only sporadically [2]. At the beginning of the twentieth century, American Indians were described as "never having cancer" [3]. The SEER data in mid-century showed American Indians to have the lowest incidence rates among ethnic groups, although they did show the least favorable survival rates [4]. A growing interest in cancer prevention and control, which has emerged from advances in research knowledge of cancer etiology, encompasses the epidemiologic evidence that the way people live can affect their chances of getting cancer [5]. Since more American Indians are living longer, more might be expected to develop cancer, and since many have been assimilated into the larger society, their risks of getting cancer are becoming more comparable. The evidence that cancer is increasing in this population has been demonstrated [6]. Other factors to explain this increase include genetic predisposition, heretofore a protective factor that has been modified by environmental influences that change the patterns of survival.

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Specific cancers in isolated regions are disproportionately present when compared to the larger society and require special investigation into their etiology.

LUNG CANCER

Lung cancer is the most common cause of cancer death for all American Indians by a factor of more than two [6]. The SEER data that originally surveyed American Indians in New Mexico and Arizona from 1977 to 1983 did not demonstrate this high incidence [7]. Using National Center for Health statistics, Welty [8] contrasted age-adjusted mortality rates for all cancer sites from 1981 to 1983 and found higher mortality rates for the Northern Plains (Aberdeen, Bemidji, and Billings areas at 147.8, 154.4, and 150.1, respectively) when compared to the Southwest areas (Albuquerque, Navajo, Phoenix, and Tucson at 93.3, 70.0, 74.8, and 97.5, respectively). This difference was largely attributable to lung cancer (Aberdeen, Bemidji, and Billings as 35.3, 47.7, and 45.9, respectively, compared to Albuquerque, Navajo, Phoenix, and Tucson at 6.6, 3.9, 12.4, and 3.3, respectively). Alaska Natives for this period had a cancer mortality rate of 155.5 for all sites and 34.3 for lung cancer, a finding similar to that in Northern Plains American Indians. Tobacco, originally a Western Hemisphere plant that was used infrequently in ceremonies by American Indians before the European conquest, has become commonly used (cigarette smoking) by both the Anglo and the American Indian and Alaska Native populations [9]. Dramatic increases in lung cancer rates following mass adoption of cigarette smoking by men and then women of this special population since the early part of this century have been noted previously [5]. Surveys of the prevalence of cigarette smoking among adult American Indians/Alaska Natives for years from 1979 to 1986 show low prevalence rates for Southwestern Indians (21) and Navajo (13) compared to the Sioux (42) and Cheyenne River Sioux (59) of the Northern Plains [8,10].

Urban American Indians who live predominantly in three cities—Los Angeles, Oklahoma City, and Tulsa, Oklahoma—represent 52 percent of the total population and have a prevalence of cigarette smoking of 70 percent [8]. Sievers recognized the low incidence of lung cancer in Southwestern American Indians in 1961 and attributed the increasing incidence of lung cancer in

American Indians living in Oklahoma and in Alaska Natives to the adoption of the cigarette smoking habit by these indigenous populations [11,12]. Many Inuits (Eskimos) have become heavy cigarette smokers, and lung cancer has increased in this population from 7 percent (1950–66) to 25 percent (1967–74).

The mortality rate from lung cancer is nine times greater for Oklahoma Indians than for the Southwest tribes. In 1984, Samet observed that in a predominantly nonsmoking population of Navajo men, the association between uranium mining and lung cancer was statistically significant, which indicated that in this otherwise low-risk population, lung cancer could be attributed to this hazardous occupation [13].

CANCER OF THE UTERINE CERVIX

Carcinoma of the uterine cervix in American Indian women is twice that for all Americans, at a rate of 19.9 per 100,000 [6]. The incidence varies greatly by area, and American Indians have a higher than expected mortality rate. From the period of 1955 to 1974, the death rate in Oklahoma Indians, as compared to the total United States population, was consistently higher [15]. This data contrasts with the report of 1969 when the incidence was not as high but is consistent with the data reported by Jordan and Key in 1981 [16,17].

From 1978 to 1981, cancer of the cervix ranked second to breast cancer in incidence in American Indian women in New Mexico. Eighty percent of the deaths were in women over forty-four years of age, which suggests that an effort to increase screening in older American Indian women might be a successful intervention [6,17]. An evaluation of the uterine cervix screening program in New Mexico and Arizona from 1966 to 1975 showed that the majority of women in the childbearing ages were screened, but few women over the age of fifty were examined. In the older population, the incidence rates of invasive cervical cancer were particularly high when compared to the larger population. None of the older American Indian women gave a history of previous cytological screening [17].

The general adoption of the Papanicolaou cytological testing for cancer of the uterine cervix was published in 1943 but was not adopted as a screening procedure in the community until the early 1970s, when an estimated 40 to 90 percent of women had been

tested [5]. Cultural barriers and lack of education were thought to contribute to the failure of American Indian women to be screened [17].

BREAST CANCER

Breast cancer occurs in American Indian women but not with the same frequency as in the non-Indian population; this form of cancer does, however, appear to be increasing [6,15]. Survival is also poor in this special population, as indicated by the SEER data in New Mexico and Arizona [4]. More advanced stages were found at the time of diagnosis, with remote metastasis found in 25 percent of American Indians, 12.5 percent of Hispanics, and 10.2 percent of Anglos. Socioeconomic status in American women may be a discriminating factor, since twice as many American Indians (27.5 percent) live at or below the poverty level, compared to 12.4 percent for the total population (based on the 1980 census). American Indian women living in Oklahoma, which includes two of the major urban areas, have shown an increasing incidence of breast cancer [12,18].

BILIARY CANCER

Southwestern tribes were studied by Sievers and later by Black and clearly were demonstrated to have a high incidence of biliary malignancies [19,20]. This is one of the cancer sites for which American Indians have a higher incidence rate than the non-Indian population, with a fourfold excess of 10 cases per 100,000 compared to 1.9 cases per 100,000 for Anglos [14]. The association of cholelithiasis and carcinoma of the gallbladder in American Indians and admixed Hispanic (Mexican) American Indians was observed by a number of different investigators whose reports focus on Indians in the Southwest but span most of the North American continent, including Alaska [21]. Genetic factors that predispose to higher rates of cholelithiasis are thought to be partially responsible. The constellation of obesity at an early age, adult onset diabetes mellitus, the formation of cholesterol stones and gallbladder cancer, especially in females, suggests a gene-environment interaction and is designated by Weiss as the "New World syndrome" [22].

GASTRIC CANCER

Although mortality rates for gastric cancer have decreased markedly over this century in the United States, the rates have not decreased for American Indians [6]. Gastric cancer is the third leading cause of death in the American Indian population of the Southwest. This special population experiences one-half the survival at one and five years of Blacks or Anglos. The death rate for Indians is 15.1 cases per 100,000, compared to 7.7 cases per 100,000 for Anglos [14].

COLORECTAL CANCER

Marked differences in mortality due to colorectal carcinoma are observed among the American Indians served by the Indian Health Service [6]. Death rates per 100,000 for the Northern Plains tribal areas of Aberdeen (16.3), Bemidji (10.5), and Billings (11.6) compare to a United States rate in 1982 of 15.0 cases per 100,000. The Southwest American Indians have low colorectal cancer death rates as follows (per 100,000 cases): Albuquerque, 7.8; Phoenix, 5.0; and Navajo, 3.5. Alaska Natives, on the other hand, have a high rate due to this cancer at 17.8 cases per 100,000, when compared to the rate in whites.

PROSTATE CANCER

Mortality from cancer of the prostate is twice as high in American Indian men when compared to the non-Indian population [6]. This cancer is the most commonly diagnosed cancer in New Mexico Indian men and ranks second as a cause of cancer death in that population. The mortality rate is also high in the Aberdeen, Alaska, Bemidji, and Nashville Indian Health Services areas.

PRIMARY HEPATIC CANCER

The incidence rate per 100,000 cases for primary hepatic cancer (PHC) in the American Indian/Alaska Native population is 2.1 versus 1.8 for the non-Indian population. The significantly higher incidence of primary hepatic cancer (PHC) among Alaska Natives

as compared to United States whites—6.4 cases per 100,000 persons and 1.7 cases per 100,000 persons, respectively—is probably related to the high proportion of the Alaska Native population that is infected with the hepatitis B virus [6]. Early detection of PHC has been possible with a serological screening program semiannually among these people for elevated alpha-fetoprotein levels. A program of immunization with hepatitis B vaccine has been undertaken to attempt to reduce the incidence of PHC in this special population.

SPECIFIC CANCER PROBLEMS IN ALASKA NATIVES

From 1969 to 1983, the 64,103 Eskimo, Aleut, and American Indians (Athabascans) identified as living in Alaska were studied by Lanier with a tumor registry that specifically collected cancer data on the native populations [23]. In comparison with United States whites, the Alaska Natives have, in addition to a high rate of PHC, a high incidence of cancer of the oral cavity and pharynx, esophagus, stomach, colon, gallbladder, pancreas, cervix uteri, and kidney and renal pelvis [23]. The observed high rates for oral cavity and pharynx are mostly due to nasopharyngeal cancer (NPC), with 9.8 cases per 100,000 compared to a rate of 0.4 among the comparable Anglo group. Epidemiological studies have indicated that this is due to the risk of infection with the Epstein-Barr virus. Alaska Natives were found to have elevated mortality rates for cancer of the nasopharynx, esophagus, kidney, and salivary glands. A new tumor registry has been started in Alaska to assess the problem more accurately [14]. Almost 70 percent of Alaska Natives live in rural areas, and 25 percent live below the poverty level. The low income/education status is associated with increased cancer risk factors. Fifty-six percent of the adult Alaska Native population smoke cigarettes, and 21 percent of the children in grades 4 to 6 chew tobacco or use snuff. These statistics alone would indicate the need for a strong program of cancer control intervention.

CORRELATION OF CANCER WITH SPECIFIC TRIBES

The heterogeneity of cancer in Native American populations has been discussed previously [2]. The predilection of American Indi-

ans for lung cancer is probably related to their increased use of cigarettes. The Northern Plains tribes smoke to excess, and their incidence and death rate due to lung cancer are seven times greater than those found among the Southwest American Indians who do not smoke. The same factor is observed for Alaska Natives who have seen specifically targeted by the tobacco industry [24].

The cancer experience varies significantly among tribes and in different geographical areas. Colorectal cancer seems to exist at high rates in the Northern Plains tribes (see figure 1). Breast cancer in Southwestern American Indian women is associated with a poor survival rate. Cancer of the uterine cervix in the same group is double the rate for all the United States and occurs in older women. Carcinoma of the prostate is high in the Southwestern tribes, and the death rate is double the rate for all the United States. The unique problem of carcinoma of the gallbladder in Southwestern American Indian women, Hispanic women of mixed American Indian descent, and Alaskan women deserves further investigation. The Navajo and Athabascan share a language with many common roots, which suggests a gene-pool influence. The unusual incidence of nasopharyngeal cancer (NPC) with the associated prevalence of the Epstein-Barr virus and the primary hepatic carcinoma (PHC) associated with hepatitis B deserve further attention and offer opportunities to study new therapeutic protocols in this special population. Alaska Natives also have an unusually high incidence of cancer of the esophagus, kidney, and salivary glands, which provides opportunities for protocol research by members of the Southwest Oncology Group (SWOG). The sites of the SWOG facilities and the designated areas of the health care of the Indian Health Service are shown in figure 1. The proximity of these sites to specific tribes can be inferred, and the specific cancers that could be studied are indicated by number and location. In the Southeast, the Nashville area is associated with a higher rate of prostate cancer in American Indian men and a poor survival rate. Seattle, one of the long-established members of the group, could serve as the focal point for the clinical trials and cancer control studies of the special problems of Alaska Natives. Member institutions in Texas, New Mexico, Arizona, and Oklahoma offer a unique opportunity to register more patients in this special population for clinical trials.

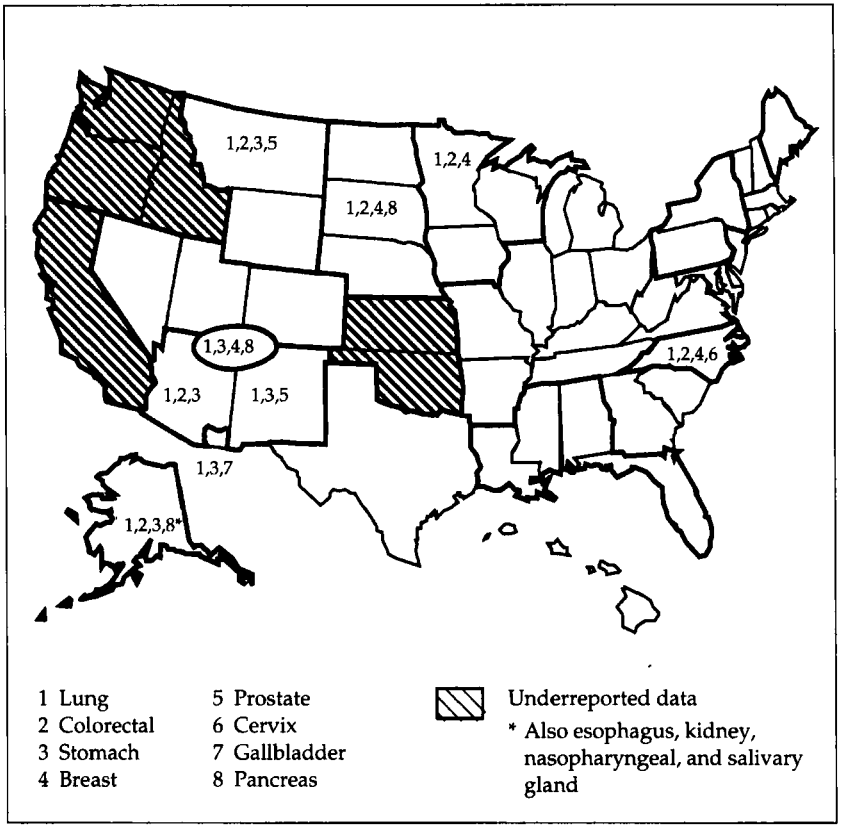

FIGURE 1. Leading Cancer Causes of Death (Indian Health Service)

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