Sun Plays Havoc With Light Skin Down Under

The blazing southern sun on fair northern complexions is proving dangerous, and sometimes deadly, to Australians, producing an epidemic of skin cancer and the world’s highest rates of melanoma.

In this issue of the Journal, researchers led by Robert MacLennan, M.B., B.S., of the Queensland Institute of Medical Research, report that men in that Australian state face a 1 in 19 risk of getting invasive melanoma by age 74, while the risk for women is 1 in 25.

Between 1979–80 and 1987, rates increased by more than half in women, reaching 39.7 cases per 100,000, while doubling in men to 48.9. There is no peak in sight. United States rates for the disease in 1985–89 (age-adjusted to the world standard population) were 10.9 for males and 8.7 for females.

Australian states operate independent public or private cancer registries with varying levels of funding. A national clearinghouse, recently set up in the Australian capital of Canberra, should help streamline data compilation, said Graham Giles, Ph.D., of the Anti-Cancer Council of Victoria. Though some states have published 1988 data, national incidence rates from 1982 are the latest currently available, with 1983–85 rates due out in the next few months.

Sun Worshippers

The latitude of Brisbane, Queensland’s capital, is the antipodal equivalent of Tampa, Florida’s. That subtropical location and sun-worshipping lifestyles combine to give Queensland the highest melanoma rate in the world. The rest of Australia is not far behind: national incidence rates for the late 1980s will likely reach about 30 per 100,000, Giles said.

“Over the ‘80s, we had something like a 7% to 8% annual increase in men and a 4% to 5% annual increase in women in Australia,” he said. “Internationally, there are similar annual percent increases, but our rates are so much higher.” Mortality rates for melanoma in 1985–89 are 4.8 per 100,000 men and 2.5 per 100,000 women, up from 1950–54 rates of 1.4 in men and 1.1 in women.

The pattern of melanoma lesion thickness evident in Queensland shows that, while part of the rise in rates appears due to earlier detection, there has also been a substantial true increase, MacLennan said. The steepest rise was seen in early invasive melanomas less than 0.75 mm thick, which increased more than either non-invasive or thicker invasive lesions. Very thick lesions also increased substantially in men.

Because they are not routinely reported, non-melanoma skin cancers (basal cell and squamous cell carcinomas) are sparsely documented in Australia’s epidemiologic literature. A population survey of 40- to 64-year-old residents of Geraldton, Western Australia, published in 1992 by Bruce Armstrong, M.D., Ph.D., and colleagues, showed non-melanoma skin cancer prevalence rates of 7% in men and 4.7% in women. Annual incidence was put at 1,560 cases per 100,000.

Armstrong, who is deputy director of the International Agency for Research on Cancer, Lyon, France, and a former health commissioner of Western Australia, estimated that about 120,000 to 150,000 cases of non-melanoma skin cancer arise each year in Australia — at least twice the number of all other cancers combined. Two out of three Australians are expected to develop non-melanoma skin cancer in their lifetime, according to one estimate.

“Many of the lesions are quite minor, and don’t have any great significance to the health of the individuals,” Armstrong pointed out. “But even so, the number of cases that slip through to the point where a person requires hospitalization and major treatment is quite substantial.”

In a 1988 publication, he placed non-melanoma skin cancer at the top of a priority list for cancer prevention research, calling it “potentially most
preventable.” Because the precise sun exposure patterns that cause these cancers are still unknown, he ranked their current “actual preventability” much lower, and emphasized the need for more epidemiologic research.

At IARC, Armstrong is proposing a major international study relating skin cancer to environmental changes, particularly ozone depletion. MacLennan and colleagues have a number of ongoing and planned epidemiologic studies on skin cancer. These include an intervention trial by Adèle Green, M.B., B.S., of sunscreens and beta carotene to prevent skin cancer in an inland population, and a study of melanoma in twins and families, headed by Nick Martin, Ph.D., to elucidate gene-environment interactions.

Australian states have mounted extensive public awareness programs on the hazards of excessive sun, with a special emphasis on the danger to children.

“Exposure in the first 10 to 15 years of life looks as if it may be particularly important, as if it may in some way set the scene for lifetime risk of the cancers,” Armstrong noted. “So protecting children from the sun is very wise advice.”

A 1990 survey in Victoria showed encouragingly high levels of public awareness and behavior in increasing sun protection, especially for children. But experts say it will likely take 20 years or more before the benefits of these precautions show up as reductions in skin cancer incidence.

Increasing awareness is already paying off in earlier detection, however. Mortality rates are increasing more slowly than incidence rates, a good indication that melanomas are being picked up earlier, much more curable stages.

In fact, for melanoma, MacLennan said, the “case fatality rate,” which is sensitive to stage at diagnosis and is based on the difference between incidence and mortality rates, is much lower in Australia than in the United States.

Another “grain of hope,” Giles noted, is that the highest melanoma rates in older men, especially those over 70, who presumably had very high cumulative exposures before the sun’s dangers were fully appreciated.

“One thing we have seen is that it is moving to earlier detection,” he said. “But that’s purely speculative.”

Familiar Patterns

Australia’s rates for other major cancers mirror those found in other developed countries. For 1986–88, the country’s overall cancer mortality rate for men (162.8 per 100,000) was nearly identical to that of the United States, while the rate for women (102 per 100,000) was slightly below the U.S. level. Mortality from cancers of the colon and rectum, breast, and prostate has stayed relatively stable in recent decades. Lung cancer has predictably risen in heavy-smoking cohorts, while stomach cancer has fallen off sharply.

Also like the United States, Australia is a country populated largely by immigrants and their descendants. As such, the country provides a natural laboratory to study the role of dietary and other cultural factors in cancer risk. Large numbers of Italians and other southern Europeans immigrated to Australia after World War II, Giles said, and although increased rates of colon, breast, and prostate cancer in these groups have been associated with duration of residence in Australia, their rates remain about one-third lower than those of native Australians.

“In the age group 50 to 75, these immigrants are now quite a large proportion of the population at risk for cancer,” he said. “Our overall rates are diluted quite a bit by this low-risk migrant population.”

Aussie Lifestyle

Added MacLennan, “We just don’t know for sure what it is about the Aussie lifestyle” that increases risk for certain cancers, “whether it’s the large amount of meat we eat, the beer we drink, or just that we’re an affluent Western population that doesn’t exercise enough.”

Giles noted that, as in the United States, dietary and other risk-related behaviors are moving toward healthier patterns, but old habits die hard.

“It is changing, but there’s probably a cohort of people who still maintain those habits, and it’s probably social class-related. The upper and middle classes are changing, but the lower socioeconomic groups probably aren’t.”

One of the biggest mysteries in Australian cancer epidemiology is the increase in non-Hodgkin’s lymphoma rates. Why are they (like U.S rates) among the world’s highest?

“I have no idea,” Giles said. “Unless . . . it might just be plausible that UV radiation exposure has an immunodepressive effect. If you’ve got a population
that's being immune depressed because of its solar radiation exposure, you could expect to see an increase in lymphomas. Pure conjecture, but I think there might be some biological basis to it. There's lots of evidence to show that exposure to ultraviolet-B radiation is immune depressive both in laboratory animals and in humans."

Australia's Aborigines, who make up only about 1% of the population, have patterns of cancer more similar to other indigenous peoples and inhabitants of the Third World than to Australians of European descent.

Though cancer in Aborigines has not been extensively studied, the most common cancers are lung, liver, and cervical. Liver cancer may be linked to hepatitis infection and alcohol consumption, while cervical and other genital cancers may result from human papillomavirus infection, according to Giles.

New Zealand, Australia's British Commonwealth neighbor to the southeast, has a similar pattern of cancer problems, reflecting a common European heritage.

High Fat

"We have very high rates of bowel cancer, probably related to high intake of meat fat," said Jeff Brown of the Cancer Society of New Zealand. Women in this country have the world's highest colorectal cancer mortality rates, while men are ranked fourth, according to the World Health Organization.

Skin cancer is also a big concern in New Zealand, though the climate is more temperate than much of Australia (the latitude of its capital, Wellington, is comparable to New York City's).

"Although we're not on a par with Queensland, melanoma is one of our biggest problems," Brown noted. Incidence rates in recent years have topped 30 per 100,000 in women and 25 in men, while mortality rates are higher in men.

Cancer statistics collection has suffered upheavals during the process of health care reform, but the data are "reasonable," he said. "We had one of the first complete registries, but it fell into slight disrepair over the past few years. We're just into legislation again to get it back to full bore." The Cancer Society, a voluntary, privately funded organization, monitors the registry and is "the key cancer body in the country," he said.

Women of the Maori, the original settlers of New Zealand, have the highest lung cancer incidence of any female population in the world, and the Maori men's rate is also among the highest. (Though full-blood Maori have disappeared, about a quarter million of the country's 3.25 million people claim significant Maori blood, Brown said.)

"They are inordinately heavy smokers," he explained. "They were into pipe smoking in a big way, and then courtesy of the Colonial invaders, they were introduced to filter-tip cigarettes."

The Cancer Society of New Zealand's prevention efforts have included melanoma awareness, "Fit Food" programs, and work to legislate smoke-free indoor areas, Brown said. Along with running a general skin cancer awareness campaign, the society has targeted its melanoma prevention message to a specific age group each year, starting with children 4 years ago and progressing this year to men 45 and older, who are reminded to have suspicious spots checked by a doctor.

"This year we've gone a step further," he added. "We're going to sell our own brand of sunscreen and sunglasses. It seems a natural progression — we created the market, so now we'll make money out of it."

— Tom Reynolds

Dangers Seen in Increased Treatment Of Elderly

In recent years, a number of specific groups, including minorities, the poor, and women, have been identified as medically underserved. Most recently, attention has focused on the elderly.

Studies have shown that older persons are underrepresented among patients referred to major cancer centers, that they receive less screening for cancer than younger persons, that their diagnosed cancers are less often adequately staged, and that they receive less aggressive therapy and, sometimes, none at all (see News, March 18, 1992).

Striking a Balance

But as caregivers move to redress these imbalances, some observers worry that the pendulum could swing in the direction of overtreatment of the elderly.