

The Kauai Skin Cancer Study—1983 to 1992

George T Reizner MD*

The Kauai Skin Cancer Study began as a modest effort in 1983 to look at this island's skin cancer incidence. David Elpern MD, Kauai's only dermatologist at the time, was interested in the large number of these tumors in his practice. He first enlisted his office staff to help keep track of the numbers and type of these skin cancers. Along with this information, the basic demographic data on each patient was collected. These records became the first entries into what has become a decade-long project.

Hawaii's strong ultraviolet light and predictable good weather create an opportunity to study solar radiation's effect on a population. This, coupled with the outdoor life-style of many of its residents and visitors theoretically increases the risk for skin cancer.

The collection of data on Kauai was simplified by several features, making this island a good site for study. There is only one pathology laboratory, which greatly standardizes data and case identification. Also important, most patients seek their medical care on island; therefore, with good confidence, most biopsy-proven cases can be captured. Even if another physician treated the patient on Kauai, the pathology specimen would pass through the one laboratory allowing it to be included in the count.

The presence of several different ethnic groups on Kauai invites the simultaneous study of these different in types in the same environment. This one feature alone led to several publications reporting the lesser-known incidence of skin cancer in non-Caucasian populations. All of these preexisting conditions and circumstances allow for easier collection of data and underscore this setting's value as a site for investigation.

The Kauai skin cancer study includes not only basal cell carcinomas and squamous cell carcinomas but also records the incidence of Bowen's disease, keratoacanthomas, melanomas, and various other uncommon cutaneous malignancies. This expanded list enables us to check more reliably their frequency, especially when recorded over many years.

Now, 10 years later, the scope of the Kauai Skin Cancer Study has exceeded its original design. Kauai, as a natural laboratory, has shown itself well suited to the study of skin cancer with several papers already published that discuss the results and experience of this project.

One of the first articles examined the relative increase in non-melanoma skin cancers in the Kauai Japanese population as compared to the experience in Japan¹. The crude rate of

skin cancer found in Kauai's Japanese patients was 88 times greater than that reported in Japan. Interestingly, the tumors here occurred only in patients >60 years old. When the age-adjusted rates were calculated with this in mind, an incidence 33 times greater than in Japan was reported.

Although the absolute rates were still much lower than those reported in the Caucasian population, this unexpected finding in the Japanese contained several messages. First, as originally suspected, the incidence of skin cancer on Kauai was proving to be an increased health risk. Second, both the lower incidence when compared to Caucasians plus the relatively delayed tumor onset in this non-Caucasian population reinforced the concept that partial but incomplete protection from tumor formation was conferred by darker skin. Third, it showed monitoring several ethnic groups in parallel was proving valuable; and finally, that probably all these groups were at some increased risk.

In an article recently accepted for publication, we looked at the skin cancer incidence in our Caucasian population. Kauai has the dubious distinction of having the highest reported rate of basal cell carcinomas currently observed in the United States. Work in progress based on this data includes studies documenting the incidence of basal cell carcinoma on Kauai and particularly of keratoacanthomas. A third investigation looks at the incidence of basal cell carcinomas, squamous cell carcinomas and keratoacanthomas in the Filipino population, and a fourth will report on basal cell carcinomas and keratoacanthomas in Hawaiians. Papers on these topics have already been accepted by peer-reviewed journals.

An important work underway is our 10-year experience with malignant melanoma. Many useful insights may be possible by cross-referencing these patients with those in the non-melanoma study. It is still too early to speculate, yet certain skin cancers or combinations of skin cancers may serve to alert us to a higher risk of melanoma. The outcome of this part of the project is being awaited with heightened interest.

The future for the Kauai Skin Cancer Study is equally interesting as we pursue many additional venues of investigation. This data base, which is currently supported by a Veterans Administration Merit Grant, has shown itself to be a rich source of information. The final years of the 10-year study are being collected and prepared for statistical analysis.

The study has been a cooperative effort by many physicians and scientists. Dr. Evan Farmer from Johns Hopkins read many of the early slides; Tsu Yi Chuang MD MPH from Wright State University has added his epidemiological skills and been instrumental in writing papers and grants. Jenny Stone MD from the Straub Clinic & Hospital in Honolulu has seen and treated patients, collected information from them

* George T Reizner MD
Associate Professor of Medicine, Dermatology
University of Wisconsin

and has done much of the early computer work. The entire dermatologic staff at the Kauai Medical Group deserves both praise and thanks. Additional special recognition goes to Terrilea Burnett, whose thoroughness contributed significantly to each phase of this project, and Katie Beer, who has assumed many of the same responsibilities.

The team of pathologists at GN Wilcox Memorial Hospital in Lihue: Rex Couch, Gerald Tomory, Jonathan Charles, and posthumously Robert Emrick, plus their office personnel, Louise Yates and Fern Bungcayao, have been indispensable in offering learned opinions and in collecting and retrieving thousands of cases. Without their support, interest and help, we never could have undertaken this study. I have served as a liaison to help hold the project together. Over the years I have logged many long hours of reading slides, contacting patients, entering data, combing through charts, writing papers and attending to many extra details. My reward has been the satisfaction of seeing this project through and the opportunity to travel from the Mainland and visit this beautiful island regularly.

Finally, although many have collaborated at various levels for the success of this project, it is David Elpern's initial interest that made it possible. Those of us involved are grateful for his continuing contribution and salute his curiosity that enabled him to conceive and shape this program.

Summary

The Kauai Skin Cancer Study offers a small glimpse into understanding cutaneous malignancies. Through these efforts valuable data may be gathered. It is hoped this can be translated into useful clinical information with a positive impact on both public health education and medical care.

REFERENCES

1. Leong G, Stone J, Farmer E, Scotto J, Reizner G, Burnett T, Elpern D. Nonmelanoma skin cancer in Japanese residents of Kauai, Hawaii. *J Am Acad Dermatol.* 1987;17:233-8.



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