

Sentinel Health Event Surveillance: Skin Cancer of the Scrotum in New York State

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Abstract: Skin cancer of the scrotum is a disease that has been identified as a sentinel health event (occupational) (SHE(O)) that is necessarily occupationally related. The present paper examines the feasibility of using this disease in active cancer surveillance in New York State. After consulting cancer case reports, hospital records, death certificates, and city directories, we obtained occupational data for 17 of 22 cases of nonmelanoma skin cancer of the scrotum

diagnosed between 1979 and 1984. Only three cases had occupations previously linked to scrotal cancer, while 11 of 19 cases had one or more possibly contributory medical conditions. The probable under-reporting of scrotal cancer cases and incompleteness of occupational data may limit the usefulness of scrotal cancer as a sentinel health event (occupational) unless additional steps are taken. (*Am J Public Health* 1989; 79:1513-1515.)

Introduction

Cancer of the scrotum, which has been associated with exposures to numerous hydrocarbon products,¹ has been identified as a sentinel health event (occupational) (SHE(O)).² A SHE(O) is defined as:

an unnecessary disease, disability, or untimely death which is occupationally related and whose occurrence may: 1) provide the impetus for epidemiologic or industrial hygiene studies, or 2) serve as a warning signal that materials substitution, engineering control, personal protection, or medical care may be required.²

SHE(O)s can be broken down into two broad categories: those which are necessarily occupationally related and would be unlikely to occur in the absence of occupational exposures, and those which may or may not be occupationally related. In the original SHE(O) paper,² scrotal cancer was identified as one of the three malignant neoplasm SHE(O)s that are necessarily occupationally related.

The Cancer Surveillance Program of the New York State Department of Health is assessing the feasibility of active surveillance using data from the State Cancer Registry to monitor SHE(O) cancers. This feasibility study has examined in detail the occurrence of necessarily occupationally related SHE(O) cancers in New York State and the information on individuals with these cancers obtainable from routine data sources. This paper presents the results of this examination for skin cancer of the scrotum.

Methods

The source of data was the New York State Cancer Registry, which receives reports from physicians, laboratories, and hospitals on all cases of cancer diagnosed in the state, as required by law. Cases are also obtained from death certificates, and through reciprocal interstate reporting agreements. Based on various quality control studies, cancer reporting to the Registry is estimated to be over 95 percent complete for the state.³ At the time the Registry case listing

for this analysis was obtained, case reporting was complete through 1984.

Since it is the epithelial cancers of the scrotum that have been identified with occupational exposures, analysis was confined to these morphologic types. Reporting to the Cancer Registry of nonmelanoma skin cancers of the scrotum, which account for the majority of epithelial scrotal cancers, began in 1979. The present analysis includes cases reported from 1979 through 1984.

Cancer Registry data were supplemented by an examination of hospital records for the cases of nonmelanoma skin cancer of the scrotum identified through the Registry. Hospital records were reviewed for information on smoking history, occupational exposures, course of illness, and any prior or concurrent medical conditions that may have been related to the development of scrotal cancer. Information on occupation was also sought from city directories and from death certificates when appropriate.

Incidence rates for scrotal cancer were computed as average annual rates for the period 1979 through 1984. Rates were age-adjusted to the 1960 United States population to allow for the comparison of rates in different populations.

Results

The New York State Cancer Registry identified 30 incident cases of epithelial skin cancer of the scrotum in New York State residents between 1979 and 1984. This corresponds to an average annual age-adjusted incidence of 0.56 per million males. The epithelial cancers included 22 cases of nonmelanoma skin cancer, all of which were the squamous cell type, and eight other epithelial types such as adenocarcinoma and unspecified carcinoma.

Occupational History

The cancer case report requests information on employer, industry and usual occupation, but only eight of 22 nonmelanoma skin cancer cases had an occupation listed on the case report. These occupations tended to be in the managerial and professional, or service categories. Hospital records, obtained for 19 of the 22, confirmed any occupations listed on the cancer case reports and provided occupations for five additional cases—all in the skilled, semi-skilled, or unskilled labor category. Death certificates supplied occupational information for three more cases, and a city directory provided occupation information for another case. After consulting these sources, five occupations remained unknown. These results are summarized in Table 1.

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TABLE 1—Occupational Categories of Males Diagnosed with Nonmelanoma Skin Cancer of the Scrotum, New York State, 1979–84, by Source of Occupational Information

Occupational Category ¹	Cancer Case Report	Hospital Records	Death Certificate	City Directory	Total
Managerial or professional Skilled,	4	0	0	1	5
semi-skilled or unskilled workers ²	1	5	1	0	7
Service occupations	2	0	0	0	2
Technical, sales and support	1	0	1	0	2
Farm occupations	0	0	1	0	1
Total	8	5	3	1	17

NOTES: 1. Occupational categories derived from summary groupings found in the 1980 *Census of Population: Alphabetical Index of Industries and Occupations*, US Department of Commerce, 1982.

2. Includes US Census categories Precision Production, Craft and Repair Occupations, and Operators, Fabricators and Laborers.

Five additional occupations remained unknown.

Three of the persons classified as skilled, semi-skilled, or unskilled workers had occupations that could have put them at elevated risk of scrotal cancer. These included a bridge painter who had reported occupational exposures to graphite and kerosene, a machinist who may have been exposed to carcinogenic cutting oils, and a mechanic for a heating equipment business who had possible exposure to soots and tars. Each of these substances has been linked with scrotal cancer.^{1,4} None of the other occupations presented any apparent opportunities for relevant exposures to occur.

Medical Risk Factors

Medical records showed that eight of the 19 squamous cell skin cancer cases with available medical records had a prior history of cancer. Five of these prior cancers were skin cancers (two squamous cell, one malignant melanoma, one unspecified skin, and one mycosis fungoides). One other person had a history of psoriasis, which was treated with coal tar. The patient with mycosis fungoides had undergone PUVA (psoralen-ultraviolet-light) treatments, a regimen often used to treat psoriasis and linked to squamous cell cancers.⁵ Other conditions which may have had significance in the development of scrotal cancer are a prior injury to the urinary tract, undescended testis, and "very poor hygiene." The latter condition has been identified as a risk factor for scrotal cancer from the days of Percivall Pott,^{6,7} up to a recent case series.⁸ There were 11 persons in all who may have had one or more possibly contributory medical conditions.

Other Geographic Areas

The age-adjusted rate (0.56 epithelial cases per million man-years) in New York State for 1979–84 compares with age-adjusted rates of 1.32 per million for Connecticut during the 45-year period 1935–79, and 0.97 per million in Connecticut for 1975–79.⁵ More recent data from Connecticut* show an age-adjusted rate of 1.28 per million males for all cancers of the scrotum for the period 1978–84. If epithelial cancers still account for 75 percent of all scrotal cancers reported in

Connecticut, then the epithelial scrotal cancer rate is roughly 0.95 per million males, nearly twice that observed in New York.

The age-adjusted incidence rate of 0.52 per million males observed for New York City was compared with that for Metropolitan Detroit, a northern industrial urban area with a similar proportion of black males. The Detroit figures for 1979–84** give an average annual age-adjusted rate of 1.14 cases per million males, which is again about twice that for New York City.

In New York, none of the 30 epithelial cancers of the scrotum reported through 1984 was the (less serious) basal cell carcinoma. Nine of 71 confirmed epithelial cancers in Connecticut from 1935 through 1979 were basal cell, and three of 16 epithelial cancers in Metropolitan Detroit from 1979 through 1986 were basal.

Discussion

Incidence rates of epithelial cancers of the scrotum in New York State and New York City are approximately half those of the Connecticut and Detroit SEER† areas, respectively. This may indicate some degree of underreporting, but the extent to which this deficit may also reflect true differences in occupational exposures is not known. The predominance of the squamous cell type also supports the possibility of differential underreporting of the less serious cases.

Skin cancer of the scrotum has been characterized as a cancer whose occurrence is unlikely in the absence of occupational exposures.² In the present study, evidence of a possible occupational origin was found for only three of the 17 cases for whom occupational data were available. In contrast, 11 of the 19 persons for whom hospital records were available had prior or co-existing medical conditions that might be related to their scrotal cancers.

One possible interpretation of these findings is that occupational cancer of the scrotum in New York State is at such a low level that "background" or nonoccupational cases predominate. However, the possibility of significant underreporting, particularly of uncomplicated cases, makes it conceivable that an occupationally related spatial or temporal clustering may not be reflected in Registry data.

A related issue is that of the completeness and quality of the occupational data that are available. Less than half of cancer case reports had occupation listed, and those occupations that were listed tended to be of the type where unusual exposures generally do not occur. For the remainder of cases, it was necessary to consult several sources of varying accessibility and completeness. Hospital records provided occupational information for more patients than the cancer case reports, but had to be sent for specially, a process often taking several weeks. New York State death certificates are generally good sources of occupational information, but their usefulness is limited for nonfatal diseases such as skin cancer of the scrotum. It was also not feasible to obtain death certificates for New York City residents, who made up 40 percent of the cases. City directories can provide occupational information, but are not a consistent source since complete listings are not available for all areas. After con-

**Schwartz A: Michigan Cancer Foundation, personal communication, 1988.

†SEER: Surveillance, Epidemiology, and End Results, the population-based cancer surveillance system established by the National Cancer Institute in 1970.

*Flannery JT: Chief, Connecticut Tumor Registry, personal communication, 1988.

sulting all these sources, nearly one fourth of the occupations were still unknown. Furthermore, the occupations that were ascertained represent the usual or the most recent occupation; other pertinent occupations may not be recorded.

Steps may be taken to improve the representativeness and completeness of data on scrotal cancer cases and their occupations collected in the future. One would be to remind all physicians of their duty to report nonmelanoma skin cancers of specified sites, and of the proper format and reportable items. A second step might be to send a reminder to all hospital tumor registrars regarding the importance of completing the occupation section on the cancer case report. Obtaining more complete occupational histories would require contacting cases or their next-of-kin directly, often requiring more extensive resources than generally available for surveillance activities.

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The Homeless Families Program—A National RWJ/HUD Initiative

A multi-million dollar public/private program for homeless families has been announced as a cooperative national initiative of the Robert Wood Johnson Foundation and the US Department of Housing and Urban Development (HUD).

The Homeless Families Program is intended to help communities develop the infrastructure necessary to strengthen the potential of homeless parents and their children to function successfully. The Johnson Foundation will make as many as eight two-year grants of up to \$300,000 each to eligible cities (population 250,000 or more) or the counties in which these cities are located; Public Housing Authorities (PHAs) in jurisdictions selected under the competition will also be eligible for a share of the Section 8 certificates HUD will set aside for this purpose. The grants and housing certificates will support community-wide projects aimed at providing comprehensive health and supportive services and housing assistance to homeless families suffering from complex, often chronic, problems, including health and mental health problems, inadequate education or job training, and lack of day care and other services.

The goal of the Homeless Families Program is to show that even in the most dysfunctional families, appropriately designed health and support services, combined with suitable housing, can help parents become healthy and hopeful, and avoid becoming permanent members of the nation's underclass. The program also seeks to promote the long-term expansion of permanent housing options for these families.

Interested applicants should send a letter of interest to: **Dr. James O'Connell, Director, Homeless Families Program, Massachusetts General Hospital, 32 Fruit Street, Boston, MA 02114**. Limit the letter to two typed, double-spaced pages. Identify the parties to be involved in developing the application, documenting local government support, and generally outlining the project to be proposed. A contact person should be identified to serve as principal liaison during the application process. Application materials will be sent upon receipt of the letter. **The deadline for receipt of applications is December 22, 1989**. Grant recipients will be announced May 1990. The Robert Wood Johnson Foundation is at College Road, PO Box 2316, Princeton, NJ 08543-2316.