HISTOPATHOLOGIC CANCERS IN THE COMMONWEALTH OF DOMINICA

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INTRODUCTION

At their Eighth Conference in Barbados in 1982, the Caribbean Health Ministers expressed concern about the incidence of cancer and resolved to work toward control of this disease in the Caribbean. The following are among the circumstances cited by the *West Indian Medical Journal (1)* as impeding forward progress: (a) inadequate or absent cancer registries; (b) lack of oncology departments on the larger islands; (c) lack of adequate treatment facilities, especially radiotherapy centers; and (d) insufficient screening of people for certain cancers, most notably cervical cancer, that can be prevented or cured if treated early. There is also need of an active education program, not only for the general public but also for health administrators and health care personnel.

This article presents some basic data about cancers diagnosed on the island of Dominica. Regarding the foregoing points about cancer registries and radiotherapy, it is worth noting that there is no cancer registry in Dominica, and that most Dominican patients requiring radiotherapy must travel to Barbados to receive it. However, Dominica is one, perhaps the only one, of the less-developed Caribbean islands where local histologic services have been continually available since 1968. Thus, although cancer data in the Caribbean are generally limited *(2)*, this country has a small but worthwhile store of information based on microscopically diagnosed cases that can be used to evaluate cancer patterns.

Geographically, Dominica is like most other islands in the Lesser Antilles—mountainous and of volcanic origin. It is the most northerly and among the largest of the Windward Islands, being 298 square miles in area; its economy is based on agriculture, the chief crops being bananas and citrus fruits. The available flat land, where about 90% of the people live, is mainly coastal.

Dominica's 1981 census reported the total population to be 74,017 (36,866 males and 37,151 females). A further breakdown showed that about 6% of the inhabitants were over 65 years old, 10% were between 45 and 64, 43% were between 15 and 44, and the remaining 41% were under age 15.

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Dominica's National Health Plan for 1982–1985 employs mortality figures from 1976–1978 death certificates. These figures indicate that in those years the leading causes of death, in descending order, were as follows: heart diseases, 12%; malignant tumors, 11%; hypertensive diseases, 7.7%; and cerebrovascular diseases, 7.5%. The total number of deaths recorded over this three-year period was 1,472. The number of people believed to have died from cancer in that period was 154 (79 males and 75 females).

Malignancy contributed primarily to mortality in those over age 65, accounting for six of every 10 male deaths and five of every 10 female deaths in that age group. However, it also played a significant role in the mortality of younger people, ranking as the first cause of death in both men and women 45 to 64 years old and the second cause of death (after accidents) among those 15 to 44.

The annual reports of the Chief Medical Officer showed a slight change in 1981, when malignancies became the leading certified cause of death—accounting for 15% of the recorded fatalities, followed by hypertension and heart disease. However, malignancies reverted back to second place (after heart disease) in 1982 and 1983 (in 1983, 21% of the 349 recorded deaths were caused by malignancies, as compared to 23% caused by heart disease).

During the 1980–1983 period, when cancers accounted for 16.6% of all recorded deaths, the numbers of fatalities attributed to malignancies originating at different sites were as follows:

1) digestive organs and peritoneum	83 deaths
2) genitourinary organs	72 deaths
3) lymphatic and hematopoietic organs	22 deaths
4) respiratory and intrathoracic organs	18 deaths
5) lips, oral cavity, and pharynx	13 deaths
6) female breasts	12 deaths
7) other sites	27 deaths

The annual crude death rate per 100,000 population ranged from 460 to 550 in these four years, while the annual cancer death rate per 100,000 inhabitants ranged from 67 to 94. As these data suggest, cancer is a sufficiently important problem to justify presentation and analysis of the more accurate data available from histologic diagnoses and comparison of these data to available death statistics. For a small country such as Dominica, the total numbers involved are small, but the resulting information may nevertheless prove useful.

MATERIALS AND METHODS

The surgical log books of the Princess Margaret Hospital Laboratory, located in the capital city of Roseau, are used to record the hospital's pathologic diagnoses. In addition, the hospital's full surgical reports are maintained in the laboratory files. Both of these sources of data were utilized to obtain the information presented here on cancer diagnoses. If there was any discrepancy between these two sources, or if the diagnosis involved was uncertain, available microscope slides of tissues obtained from the deceased were examined by the author and a diagnosis was reached by him.

A National Pathologist was employed in Dominica from 1968 until 1976; another was recruited for the year 1981; and from 1982 onward a patholo-

gist (the author) employed by the Pan American Health Organization was stationed on the island. During the intervening years (1976–1980), specimens were sent to other Caribbean territories for assessment.

The 10 years chosen for this presentation (1969–1975 and 1981–1983) are years for which the files are available and complete, and also years when pathologists were locally employed and the diagnoses recorded were made at the national laboratory. Of course, not all people with cancers (not even all those admitted to a hospital) had tissue removed for diagnosis. However, during the years covered the Princess Margaret Hospital had a well-equipped operating theater, a pathologist, and qualified surgeons, gynecologists, and internists. Since few Dominicans are likely to have travelled to other countries for their medical problems, it is felt that most cancer cases were seen at this institution and were diagnosed through microscopic examination at the hospital laboratory.

Results

Table 1 indicates that 392 (4.1%) of the 9,478 microscopically examined specimens (including surgical specimens, cytology specimens, and bone-marrow smears) were malignant.

Table 2 shows that more cancer diagnoses were made in female patients than in male patients, the ratio of diagnoses being 1.4 in women to 1.0 in men. This difference was due primarily to large numbers of breast and cervical cancers (the latter not including cancer in situ). Indeed, cancers of the female breasts and uterine cervix alone accounted for almost 28% of all the malignancies diagnosed, and 47% of all the malignancies diagnosed among females.

Figure 1 shows the numbers of cancers of these latter types that were

TABLE 1. The numbers of possibly malignant surgical specimens, cytology specimens, and bone-marrow smears examined at the national laboratory (the Princess Margaret Hospital Laboratory, Roseau, Dominica) during 1969–1975 and 1981–1983, and the numbers of cancers diagnosed, by sex of patients.

Year	No. of surgical specimens examined	No. of cancers diagnosed: In male patients	In female patients	In all patients (total)
1969	670	23	13	36
1970	840	11	12	23
1971	1,012	12	30	42
1972	1,117	18	13	31
1973	1,091	10	25	35
1974	1,063	14	27	41
1975	1,080	22	16	38
1981	668	20	39	59
1982	819	14	26	40
1983	1,118	20	27	47
Total	9,478	164	228	392

TABLE 2. The numbers of cancer diagnoses, by site and sex, in Dominica during the years 1969–1975 and 1981–1983.

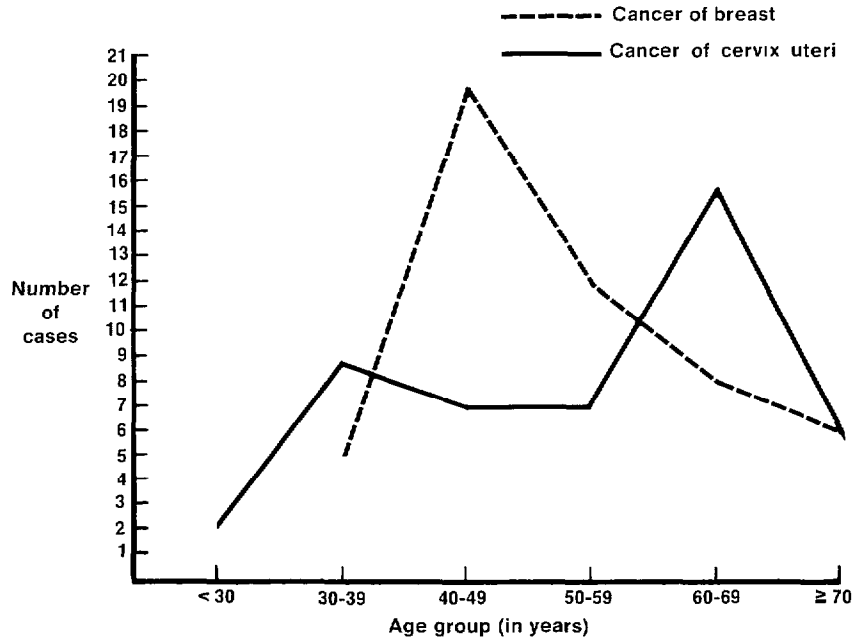
Site	Patients diagnosed as having cancer		Males		Females	
	No.	(%)	No.	Mean age in years at diagnosis	No.	Mean age in years at diagnosis
Breast	55	(14.0)	1	—	54	52.5
Uterine cervix	54	(13.8)	—	—	54	54.1
Reticuloendothelial system	35	(8.9)	21	—	14	—
Skin	31	(7.9)	20	—	11	—
Metastases (primary site unknown)	31	(7.9)	15	—	16	—
Stomach	27	(6.9)	13	58.4	14	61.4
Prostate	27	(6.9)	27	67.9	—	—
Colon (including rectum)	18	(4.6)	8	57.9	10	61.9
Oral cavity	14	(3.6)	9	61.2	5	58.3
Ovary	14	(3.6)	—	—	14	55.4
Uterine body	13	(3.3)	—	—	13	—
Liver	13	(3.3)	8	57.4	5	60.8
Penis	10	(2.6)	10	61.8	—	—
Urinary bladder	9	(2.3)	7	61.3	2	—
Nasopharynx	8	(2.0)	6	49.2	2	—
Larynx	5	(1.3)	5	56.8	0	—
Bone	5	(1.3)	3	—	2	—
Vulva	4	(1.0)	—	—	4	69.0
Others	19	(4.8)	11	—	8	—
Total	392	(100)	164	—	228	—

diagnosed in patients of different ages. The data indicate that peak numbers of breast cancers were found in the 40–49 year age group. More specifically, of 51 females with breast cancer whose ages were stated, all were over age 30, and a little more than half were over 50. Peak numbers of cancer cases involving the uterine cervix were found among older patients (those in the 60–69 year age group), even though some cases occurred in considerably younger subjects. Sixty-two per cent of the 47 patients with cancer of the cervix uteri whose ages had been recorded were 50 years old or more, the ages of those affected ranging from 28 to 77.

Among female subjects, the frequencies of cancers at these two sites were followed, in descending order, by cancers of the reticuloendothelial system, ovary, stomach, body of the uterus, skin, and colon. Overall, among females, there were 86 cancers of the reproductive system, 54 of the breasts, 31 of the alimentary tract, 14 of the reticuloendothelial system, and 11 of the skin. Ten of the 11 skin malignancies were of the squamous type, of which seven, located in the lower leg, were related to chronic ulcers.

The most frequently diagnosed malignancies among males, in descending order, were cancers of the prostate, reticuloendothelial system, skin,

FIGURE 1. Cases of breast and uterine cervical cancers diagnosed among women in different age groups during the years 1969–1975 and 1981–1983.



stomach, penis, oral cavity, liver, and colon. The reproductive system accounted for 37 cases, the alimentary tract for 31, the reticuloendothelial system for 21, and the skin for 20. There were 16 nonbasal cell skin carcinomas; 10 of these were of the squamous variety and were associated with chronic leg ulcers, and six were malignant melanomas. The age range for those 10 males with squamous cancers was 34 to 56 years.

A further breakdown of data on cancers of the digestive system is provided in Table 3. Most cancers of the stomach and colon were adenocarcinomas; and, except for a rhabdomyosarcoma of the tongue, those of the oral cavity were all squamous cancers. Stomach cancers were found in women between 32 and 85 years old (86% were over 50 and 57% were over 60), and in men between 40 and 78 years old (80% were over 50 and 30% were over 60).

Cancers of the colon (including rectal cancers) were diagnosed in patients ranging in age from 47 to 90; 88% of these patients were at least 50 years old. In the same vein, the ages of those with oral cancers ranged in age from 48 to 85, with 75% being over age 50; and patients with primary liver carcinomas ranged in age from 40 to 71, with 90% being over age 50 and 70% being over age 60.

Malignancies of the reticuloendothelial system included 17 non-Hodgkin's lymphomas (in 13 male and 4 female patients), seven leukemias, six Hodgkin's lymphomas, and five multiple myelomas. As was to be expected, the ages of those with lymphomas and leukemias varied widely. However, all

TABLE 3. Cancers of the digestive system diagnosed in 1969–1975 and 1981–1983, by site and patient's sex.

Location	No. of cancers diagnosed:		
	In males	In females	Total
Stomach	13	14	27
Colon (including rectum)	8	10	18
Oral cavity	9	5	14
Liver	8	5	13
Pancreas	2	1	3
Gall bladder	1	1	2
Small intestine	0	2	2
Esophagus	1	0	1
Salivary gland	1	0	1
Total	43	38	81

five patients with multiple myelomas were over 60 years old.

All of the diagnosed vulvovaginal malignancies were of squamous origin. Cancers of the uterine body included nine endometrial adenocarcinomas (in patients with an average age of 57.3 years), three sarcomas, and one choriocarcinoma. Cancers of the uterine cervix were classified as squamous in 39 instances, glandular in four, and undifferentiated in 11. The ages of patients with ovarian cancers ranged from 26 to 69 years.

The group listed as "Others" in Table 2 includes nine of the rarer digestive system malignancies cited in Table 3, as well as tumors of the soft tissue, eyes, lungs, brain, and vagina (one to four cases at each site). The cases involving metastatic tumors in which the primary site was unknown or unstated included 10 metastases to the external lymph nodes, seven to the liver, four to the peritoneum (with ascites), three to the skin, three to the pleura (with hydrothorax), three to bone, and one to soft tissue.

DISCUSSION AND CONCLUSIONS

This presentation has limited itself almost entirely to considering the cancer sites involved and the patients' age and sex. This is partly because more specific data were not available in many cases, and partly because the relatively small numbers studied were not well-suited to establishing likely correlations. Even so, there is every reason to expect that the data presented here will help to obtain useful insights into cancer patterns in Dominica as well as a basis for comparison between the situation in Dominica and in other parts of the Caribbean.

That cancer of the female breast and uterine cervix were the most frequently diagnosed malignancies among Dominica's predominantly black population is not an unexpected finding. Similar situations have been found to

prevail in the Bahamas *(3)*, Barbados *(4)*, and Jamaica *(5,6)*.

In many instances female breast cancers were merely diagnosed as invasive malignancies; only occasionally was a subtype specified.

Regarding cervical cancer, the patients' age at presentation tended to be older than that of patients with breast cancer—the peak coming in the 60–69 year group (versus the 40–49 year group in the case of breast cancer); but the distribution of cervical cancer cases in younger age groups (the 30–39, 40–49, and 50–59 year groups) was fairly even. A similar even distribution of cervical cancer cases among patients between 45 and 65 years old at the time of diagnosis was previously found by Wiersman and Barrow in Suriname *(7)*. In general, the rate of patients appearing with cervical cancer (the actual clinical disease) at a relatively advanced age can be reduced by instituting a Pap smear screening program to detect premalignant conditions.

The commonest male cancer diagnosed was that of the prostate gland, which accounted for 16.5% of all the male cancers detected. All of these 27 prostate cancers were adenocarcinomas. The number of diagnoses per year varied from none in 1983 to six in 1975. The patients involved ranged in age from 53 to 84 years, but only three were less than 60 years old and only three were over 79, the remaining patients (78%) being between 60 and 79. In a previous study done by Bras et al. in Jamaica *(5)* 69% of the subjects with prostate cancer were found to be in the same 60–79 age range.

During the last three years covered here (1981–1983), a total of 146 malignancies were confirmed microscopically, 54 in males and 92 in females, yielding a male:female ratio of 1:1.7. However, the 191 deaths certified as being due to malignancies in this period were distributed quite differently, there being 98 male and 91 female fatalities (the sex of the decedent was not stated in two cases) yielding a male:female ratio of 1:0.9. This pattern, in which higher numbers of female cancers are diagnosed but roughly equal numbers of male and female cancer deaths occur, is usual in Dominica; a similar pattern has also been noted in the Bahamas *(3)*.

During these same three years, sites involved in major numbers of certified cancer deaths, by order of diminishing importance, were the stomach (28 deaths, 18 among males and 10 among females), the prostate (22 deaths), the cervix (21 deaths), hematopoietic organs (13 deaths), the oral cavity (10 deaths), and the female breast (9 deaths). These were also among the malignancies most frequently diagnosed histologically, though their order of importance was different. Another study by McGlashan *(8)*, which reviewed Dominica's death statistics for 1975 to 1979, also found that the frequency of death from stomach cancer was relatively high.

Cancer of the lung or lower respiratory tract has not been diagnosed frequently among living patients in Dominica (this survey found only two lung cancers, and during the years 1979–1983 not more than 10 deaths were certified as being due to lung cancer, the largest number of deaths in any one year being five). Even if one accepts that biopsies may not be used commonly for confirming this diagnosis among living patients in Dominica, which could conceivably explain the low figures, this should not have precluded clinical diagnoses from being made, since chest X-rays are easily obtained and sputum cytology smears have been examined by

pathologists in this country. One is thus led to conclude that cancer of the lung is not nearly as common in Dominica as in Jamaica, where it is the most frequently diagnosed cancer among males and appears to have a rising incidence among females *(6)*.

Summary

As in most countries, cancer is a leading cause of death in the Commonwealth of Dominica. This article presents data on cancers diagnosed from biopsy specimens examined at Dominica's Princess Margaret Hospital in 1968–1975 and 1981–1983, years when a pathologist was available at the hospital to perform that work. Of course, not all of the island's inhabitants with cancers had tissue specimens removed for diagnosis. But few Dominicans are apt to have travelled to other areas for treatment, and so it appears that most cancer cases were seen at the Princess Margaret Hospital and were diagnosed through microscopic examinations at the hospital laboratory.

In all, 392 malignancies were diagnosed at the laboratory during the study periods. Most of these (228) occurred in female patients, making the ratio of male to female cases 1:1.4. The number of cancer-related deaths appears distributed differently, however, with the male:female mortality ratio being about even.

The cancers most frequently diagnosed in women were those of the breast and cervix, followed by those of the reticuloendothelial system, ovary, stomach, body of the uterus, skin, and colon. The most frequently diagnosed cancers among males, in descending order, were those of the prostate, reticuloendothelial system, skin, stomach, penis, oral cavity, liver, and colon.

Only two cases of lung cancer were diagnosed. This finding, together with available mortality data, indicates that lung cancer is relatively rare—far less common than in Jamaica, where it is the most frequently diagnosed cancer among males and appears to have a rising incidence among females.

Prostate cancer, the commonest male cancer diagnosed, affected patients ranging in age from 53 to 84; only three of these patients were under age 60.

Regarding cervical cancer, patients with this disease tended to be fairly old, the highest number of diagnoses being made in the 60–69 year group. In general, it appears that the rate of patients appearing with actual clinical disease at a relatively advanced age could be reduced by instituting a Pap smear screening program to detect premalignant conditions.

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