The pattern of cancer in Kampala, Uganda

Ignatius Kakande M.Med
Lawrence Ekwaro M.Med
William W. Obote M.Med
Gorreti Nassali MB ChB,
Barbara Irene Kakande MB ChB
S. Kabuye
St. Francis Hospital, Kampala, Uganda

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This study on the pattern of cancer in Kampala is based on data collected from 2246 patients at Mulago Hospital and 355 patients at St. Francis Hospital Nsambya, between January 1995 and December 1998. All diagnoses were histologically confirmed. Of these 2601 patients, 1225 were males and 1376 were females. Kaposi's Sarcoma was the commonest malignancy, accounting for 28.6% of all cancers. Among males, Kaposi's Sarcoma (KS) was the most common cancer (37.1%) followed by prostatic cancer(9.6%), lymphomas (8.5%), oesophageal cancer (7.0%), eye malignancies (3.8%) and pharyngeal cancer (3.8%). In females, the order of frequency of malignancies was cervical cancer (22.2%), Kaposi's Sarcoma (21.1%), breast cancer (10.9%), lymphoma (5.9%), oesophageal cancer (4.6%) and eye malignancies (3.6%). The incidence of KS has dramatically increased from 6.3% in males and 0.4% in females among patients with cancer diagnosed in 1977-80, before HIV infection was recognized. This paper compares the cancer patterns of 1995-98 with those of 1977-80 and discusses the possible influence of HIV infection on the change of patterns of cancer in Uganda.

Introduction

Cancer appears to have a unique place in the spectrum of human diseases. Whether the disease is found to be curable or terminal, handling a cancer patient is a struggle with the idea of death and the process of dying. Cancer is so dreadful that it often brings about tremendous trauma, social distress and misery not only to the victim but to his family as well.

Worldwide, cancer is becoming a leading cause of death. The perceived belief that it is a disease of developed and affluent communities is a common misconception. In 1984 for example, over half of the annual world total of 5.8 million new cancer cases were reported from developing nations[1]. The incidence in these countries is likely to increase due to several factors. These include improvement in health care and sanitation which will lead to an increase in life expectancy, the widespread availability of modern medical facilities, urbanization and changes in lifestyle as well as increasing public awareness of cancer[2].

In 1986, Perkins noted several limitations on collecting cancer statistics in developing countries[3]. These include a lack of health service infrastructure, restricted resources, the problem of extensive migration, the lack of updated census data and the fact that cancer is still not regarded as a major priority in many developing nations' health plans. In countries like Uganda, major diseases including cancer, have been overshadowed by the current interest in HIV infection and AIDS.

Address for correspondence: I Kakande, Dept. of Surgery, Makerere University, Box 7072, Kampala Uganda.

Patients and methods

This study is based on data collected from the records of 2601 histologically confirmed cancer patients of all ages. They were seen at Mulago National Referral and Teaching Hospital (2246 cases) and at St. Francis Hospital, Nsambya (355 cases) between January 1995 and December 1998. Information was collected from the Kampala Cancer Registery located in the Pathology Department of Makerere Medical School. Malignancies were categorized according to the systems and organs affected. The data were expressed in percentage frequency and rank. Data were also collected from the records of 377 cancer patients seen in the same hospital over a 4-year period between January 1977-80. The data obtained were compared with that recorded in 1995-98, during the AIDS pandemic in Uganda.

Results

The study population comprised 1225 (47.1%) males and 1373 (52.9%) females. The age was unknown in 83 (3.2%) of cases. Based on 2518 patients whose ages were recorded, there were 270 children under the age of 15 (10.7%) and 2248 (89.3%) adults.

Table 1. Cancer type and frequency (1995-98)

System/ Organ	Male	Female	Total	%
Kaposi's Sarcoma (KS)	455	290	745	28.6
Female Genital Tract	—	399	399	15.3
Gastrointestinal Tract (GIT)	187	152	339	13.0
Lymphomas	104	81	185	7.1
Breast	7	147	154	5.9
Male Genital tract	136	—	136	5.2
Eye	46	26	72	2.8
Pharynx	46	26	72	2.8
Respiratory Tract	30	34	64	2.5
Connective Tissue	20	21	41	1.6
Urinary system	27	12	39	1.5
Skin (excluding KS)	23	15	38	1.5
Thyroid	5	33	38	1.5
Leukaemia	16	15	31	1.2
Mouth	15	10	25	1.0
Miscellaneous or unspecified	108	91	199	7.6
TOTAL	**1225**	**1376**	**2601**	**100**

Table 1 shows the order of frequencies of malignancies affecting different systems. Kaposi's Sarcoma, accounting for 28.6%, was the most common malignancy seen in 1995-98, followed by female genital tract (15.3%), gastrointestinal (13.0%), lymphoma (7.1%), breast (5.9%) and male genital (5.1%) malignancies. Eye malignancies accounted for 3.7% of cases.

TABLE 2 Rank order and frequency of malignancy in 1225 males

Site of Malignancy	Rank	No.	%
Kaposi's Sarcoma	1	455	37.1
Prostate	2	118	9.6
Lymphoma	3	104	8.5
Oesophagus	4	86	7.0
Eye	5	46	3.8
Pharynx	5	46	3.8
Colorectal	7	36	2.9
Liver	8	34	2.8
Stomach	9	28	2.3
Skin (excluding KS)	10	23	1.9
Bronchus & Lung	11	21	1.7
Connective tissue	12	20	1.6
Kidney	13	16	1.3
Leukaemia	13	16	1.3
Mouth	15	15	1.2
Miscellaneous, unspecified	—	161	13.2

Table 2 shows the 15 most common cancers in males. Kaposi's Sarcoma accounted for 37.1% of cases followed by prostatic (9.6%), lymphomas (8.5%), oesophageal (7.0%) and eye (3.8%) malignancies.

Among the females, cancer of the cervix was the commonest (22.2%) followed closely by Kaposi's Sarcoma (21.1%), breast (10.9%), lymphomas (5.9%) oesophageal (4.6%) and eye (3.6%) malignancies (Table 3).

Table 4 shows the age and sex distribution of the patients with Kaposi's Sarcoma. The male to female sex ratio was 1.6 to 1. The age was unknown in 19 (2.6%) of the 745 patients with the disease. Two thirds of the 717 patients with known ages, were in the 20-39 year old group while 80.3% were in their second, third or fourth decades of life.

Only 45 (6.2%) of the Kaposi's Sarcoma patients were aged 50 years and above. The 20-49 year old age group accounted for only 40.5% of the general population of Kyadondo county while the same age group accounted for 80.3% of all Kaposi's Sarcoma cases.

Table 3. Rank order and frequency of malignancy in 1376 female patients

Type/site of malignancy	Rank	No.	%
Cervix uteri	1	305	22.2
Kaposi's sarcoma (KS)	2	290	21.1
Breast	3	147	10.9
Lymphoma	4	81	5.9
Oesophagus	5	64	4.6
Eye	6	50	3.6
Ovary	7	41	3.0
Thyroid	8	33	2.4
Colorectal	8	32	2.4
Stomach	10	27	1.9
Bronchus & Lung	10	27	1.9
Pharynx	12	26	1.9
Corpus uteri	12	26	1.9
Liver	14	25	1.8
Connective tissue	15	21	1.5
Skin (excluding KS)	16	15	1.0
Miscellaneous/ unspecified	—	166	12.0

Table 5 shows the pattern of malignancies seen in the two hospitals in 1977-80 before the AIDS pandemic. Kaposi's Sarcoma was seen in only 11 patients with a male to female sex ratio of 10 to 1. Nine of the 11 patients with KS were aged 40 years and above. Eye malignancies were rarer and seen in only 1.97% of cases.

Discussion

Cancer registry surveillance data are subject to three sources of error, incomplete ascertainment of cases, incomplete notification of deaths and misclassification[4]. Another influential element will be the 'local practice' in registration procedures. For patients with advanced disease, quite often no attempt is made to obtain histological confirmation of the disease. Hospital based cancer registry data mainly address crude relative frequency (CRF) for various types of cancer from which we infer which malignancies are most common. The data presented in this study may therefore not be a true reflection of the pattern of cancers seen in the Ugandan population at large.

In this study, Kaposi's Sarcoma (KS) was the most common malignancy. In males, KS accounted for 37.1% of all cancers while in females the corresponding figure was 21.1%. This was almost as frequent as carcinoma of the cervix uteri which comprised 22.2% of the cancers in the women. This

TABLE 4 Age/Sex distribution of 726 Kaposi's Sarcoma patients (1995-98) compared with population distribution (1996).

Age	Male			Female			Total		
	No.	%	PDS%	No.	%	PDS%	No.	%	PDS%
0-9	42	9.5	30.0	21	7.4	30.5	63	8.7	30.3
10-19	17	3.9	21.3	18	6.3	27.4	35	4.8	24.4
20-29	91	20.6	25.1	125	43.8	23.2	216	29.7	24.1
30-39	178	40.4	13.3	86	30.2	10.0	264	36.4	11.6
40-49	79	17.9	5.5	24	8.4	4.0	103	14.2	4.8
50-59	19	4.3	2.7	7	2.5	2.3	26	3.6	2.5
60-69	11	2.5	1.2	2	0.7	1.4	13	1.8	1.3
70+	4	0.9	0.9	2	0.7	1.2	6	0.8	1.0
TOTAL	441	100.0	100.0	285	100.0	100.0	726	100.0	100.0

TABLE 5 Frequency of malignancy in 377 patients diagnosed in 1977-80.

Type/Site of malignancy	Male		Female		Total	
	No.	%	No.	%	No.	%
Cervix uteri	—	—	51	23.4	51	13.5
Lymphoma	24	15.1	12	5.5	36	9.6
Breast	2	1.3	32	14.7	34	9.0
Liver & bile ducts	16	11.9	6	2.7	25	6.6
Colorectal	9	5.7	10	4.6	19	5.0
Oesophagus	11	6.9	7	3.2	18	4.8
Prostate	17	10.7	—	—	17	4.5
Skin (excluding KS)	5	3.2	11	5.0	16	4.2
Leukaemia	3	1.9	12	5.5	15	4.0
Penis	12	7.5	—	—	12	3.2
Kaposi's Sarcoma (KS)	10	6.3	1	0.4	11	2.9
Ovary	—	—	104.8	10	2.7	
Connective tissue	4	2.5	5	2.3	9	2.4
Kidney	6	3.8	2	0.9	8	2.1
Corpus uteri	—	—	7	3.2	7	1.9
Eye	1	0.6	6	2.7	7	1.9
Miscellaneous or unspecified	36	22.6	46	21.1	82	21.7
TOTAL	159	100.0	218.0	100.0	377.0	100.0

high frequency of KS in Uganda is a consequence of the HIV infection/AIDS pandemic. The majority of our cases were in the 20-40 year age group.

The reasons why immunodeficiency leads to cancer are multifactorial. The overall incidence of malignancies in persons infected with HIV is estimated to be 40%. Other infective agents, especially herpes virus species, play a pivotal role in HIV related KS and non Hodgkin's lymphomas (NHL)[5]. In this study, NHL accounted for 7.2% and 5.1% of all cancers in males and females respectively.

The frequency of gastrointestinal (GIT) cancers in our series was 13.0% which was much lower than the 25.5% and 29.3% recorded from Saudi Arabia[6,7]. Colorectal cancers were the commonest GIT malignancies but only made up 2.6% of the cancers in our study. In the UK, colorectal cancers are reported to account for 18000 deaths every year with some 25000 new cases diagnosed annually[8].

Hepatocellular carcinoma (HCC) is one of the world's most common cancers, causing almost one million deaths annually[9]. The overall HCC encountered in 1977-80 period was 6.6% compared with 13% in the current study. This crude incidence is an underestimation of the true frequency of HCC in Uganda since most of the cases of hepatocellular carcinoma present in their terminal stages and are not subjected to aggressive investigations or surgery.

Breast cancer was the third commonest malignancy in females (10.9%) while in 1977-80, it was the second and accounted for 9.0% of cancers diagnosed histologically. Studies done in Australia and Spain between 1983 and 1992 showed that there is a serious increase in HIV and breast cancer among young adults[10].

Breast cancer appears to occur at least a decade earlier in black African women compared with white women. In the USA, where a report has shown that the overall incidence of breast cancer is 20% lower in black women compared with white women, a higher incidence was found among black women under 40 years compared with whites of the same age group[11-14]. The population with cancer of the breast in Ugandan women, with a median of 47

years, is relatively young[15]. Currently a study is being undertaken to show whether there is any association between HIV and breast cancer in Ugandan women[16].

Prostatic cancer accounted for 9.6% of all cases and was the second most common male malignancy. In 1977-80, it accounted for 10.7% malignancies. In Saudi Arabia, the tumour constituted 3.2% and ranked 10th in frequency among males[7]. As the incidence of HIV infection declines and the life expectancy rises, prostatic cancer is going to become a very important tumour and possibly the most common cancer seen in men in Uganda. It is recommended that screening for prostate cancer among males aged 40 years and above should be encouraged and should include digital examination of the rectum for prostatic enlargement to detect any irregular or hard areas that could indicate a tumour. If any suspicious lesion is detected, further tests including ultra-sonography, acid phosphatase and prostatic specific antigen estimation, should be performed. There was a decline in the incidence of penile cancer from 7.5% in 1977-80 to 1.1% in the 1995-98 period. Penile carcinoma is generally considered to be a disease of uncircumcised males and it occurs more often in the lower socio-economic group. Improvement in health care and sanitation as well as promotion of the practice of circumcision might have been contributory factors in the decline of the incidence of cancer of the penis.

In Saudi Arabia, skin cancer occupied the seventh rank and accounted for 7.0% of all malignancies[7]. Skin cancer, other than Kaposi's Sarcoma accounted for 1.5% of the cancers. This relatively low incidence of skin cancer reported in our study could be partly because we excluded KS which in most cases involves skin and organs and because skin cancers are not life-threatening and therefore are not always referred to big hospitals.

Between 1997-80 eye cancer ranked 15th and accounted for only 1.9% of all cancers. In the 1995-98 period, cancer of the eye ranked 7th and constituted 3.7% of the malignancies. The doubling of the incidence may be due to the association between HIV and eye cancer.

In conclusion, the pattern of cancer in Kampala has been significantly influenced by HIV infection and AIDS through its association with Kaposi's Sarcoma. AIDS related KS predominantly affects the sexually active age groups. It would appear from our study, that Kaposi's Sarcoma is a good indicator of the prevalence of HIV/AIDS in the different age groups.

The time has come to regard cancer as a major priority in Uganda's health plans. Emphasis should be put on the prevention and early detection of cancer.

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