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SITUATION ANALYSIS OF CANCER MAGNITUDE IN A TERTIARY HEALTH INSTITUTION IN NIGERIA

AFOLAYAN ABIODUN FMCPATH*,IBRAHIM OLATUNDE FMCPATH, SAIDU RAKIYA FMC OBST & GYNAE, OLAOYE OLATUNDE FWACS *****

***Ilorin cancer registy, Department of pathology, university of Ilorin teaching Hospital, Ilorin, Nigeria.**
**** Department of Obts. & Gynae, University of Ilorin Teaching Hospital Ilorin, Nigeria.**
***** Department of Surgery. University of Ilorin Teaching Hospital Ilorin, Nigeria.**

ABSTRACT

Background: Knowledge of cancer magnitude and pattern in Nigeria is inadequate and is essentially based on estimation. The existing knowledge of cancer is based on the work of clinicians and pathologists who reported cases of cancer encountered during their professional practices. **Objective:** The purpose of this communication is to illustrate the magnitude and pattern of cancer at a tertiary health institution, using data generated at hospital-based cancer registry. **Materials and Methods:** The study involved analysis of data on new cancer cases registered at the hospital based cancer registry of University of Ilorin Teaching Hospital from 1998 to 2007. The method of data collection was by active reporting while sources of information included pathology laboratories, out-and in-patients records, radiology department and autopsy records. Primary sites (topography) of cancer were coded according to World Health Organization (WHO) International Classification of diseases 10th edition (ICD 10th). Analysis of data was by SPSS. **Results:** A total of 2242 new cancer cases were registered from 1998 – 2007. There were 852(38.00%) males and 1390(62.00%) females giving M: F 1:1.63. Histological verification was possible in 89.84% of cases. Breast cancer with 553 (24.67%) cases; top the list among the five commonest cancers at our centre. Others were cancer of the cervix, 328(14.63%), liver, 242(10.79%), malignant lymphoma 212(9.46%) and prostate 125(5.567%). The peak age of occurrence was the 5th decade with 456(20.34%) cases while children accounted for 9.04% of the total new cancer cases registered. **Conclusion:** In other to ensure accurate and completeness of data on cancer in Nigeria, there is urgent need for establishment of a functional and properly funded population-based cancer registry at both national and state levels.

Key words: Cancer, cancer registry.

INTRODUCTION

Cancer incidence is increasing worldwide as more cancer cases are frequently being diagnosed in developing countries. This is attributed to adoption of western life, industrialization and control of infectious diseases prompting more people living into the old age during which cancer is relatively more frequent (WHO.1992, Farley J etal. 2001, Parkin DM 2006). According to World Health Organization (WHO), about ten million new cancer cases; 5.3 men and 4.7 women developed cancer and there were 6.2million deaths due to cancer while 22.4 million persons were living with cancer in year 2000 (Farley J et al. 2001). Therefore globally the burden of cancer continues to increase and it is

marked with regional differences. In California (USA), cancer of the prostate, lung, and colorectal ranked highest in that order whereas in Korea, cancer of the stomach, lung, and liver were the commonest (Curado MP et al, 2007). In Transkei, South Africa, cancer of the esophagus was the leading malignancy in both sexes, followed by cervix, breast, and prostate in other of frequency (Parkin DM et al, 2003). Elsewhere in Africa, Uganda, and Zimbabwe, Kaposi sarcoma was the commonest cancer (Parkin DM et al, 2003). At the University College Hospital Ibadan, Nigeria, cancer data recently published showed preponderance of breast, cervix, colorectal, and prostate cancers in that center (Ogunbiyi et al, 2010).

A functional population –based cancer registry is a prerequisite to availability of a reliable, accurate and internationally acceptable cancer data in any region. Unfortunately, in African Continent, establishment of population-based cancer registry (which is vital to cancer control program) has become a mirage due to among many reasons, lack of political will or misappropriation of the meager resources. Hence, data on cancer from five African countries namely Algeria, Egypt, Tunisia, Uganda, and Zimbabwe appeared in the recently published cancer in five continents volume IX by WHO (Curado MP et al, 2007). In Nigeria, data on cancer magnitude and pattern is poor and the existing knowledge was mostly based on estimation and works of clinicians and pathologists who reported cases of cancer encountered during their professional practices. This was attributed to dearth of a functional National Population-based Cancer Registry as obtained in Europe and other developed countries such as Norway (Longman F, 2007) and Philippines (Radaniel M, 2008).

In 1990, Ilorin Hospital-based Cancer Registry (ILCR), domiciled in the department of pathology, university of Ilorin teaching hospital, (UITH) was established in collaboration with National Headquarters of Cancer registries of Nigeria with headquarters at University College Hospital (UCH) Ibadan. It was reorganized and we started active registration of malignant neoplasms in the last quarter of 1997. Ilorin is situated between longitude 2^0 45'' and longitude 2' 45'' and 6''. It is the state capital of Kwara state in the North Central geopolitical zone of Nigeria in West Africa. Thus, the essence of this communication is to reflect the activities of the registry and to highlight the magnitude, pattern, age and sex distribution of cancer over the past 10 years (1998-2007) and to establish the base line data on cancer in our center for comparison with other health institutions.

MATERIALS AND METHODS

This was a retrospective analysis of data on new cancer cases diagnosed among the hospital patients and patients' surgical tissues (from other hospitals) sent for histopathological diagnosis at University of Ilorin Teaching Hospital (UITH) Ilorin and were registered at the hospital-based cancer registry from 1998-2007. Cancer notification was voluntary, therefore to generate a reliable and ensure completeness of our data, collection of data was by active reporting, a process whereby the cancer abstractor routinely visited the various sources of information within the hospital complex. These sources included pathology, hematology and chemical and immunology laboratories, out-patients' clinics, surgical, medical, obstetrics and gynecological wards, medical records, radiology departments and autopsy register (for incidental cases). Data abstracted from both patients and cancers were registry identification number, name, age, sex, residential address and occupation. Other information (on cancer) were date of diagnosis, site of cancer (topography), cancer histology (morphology), source of information and basis of diagnosis as to whether by histology, Cytology, Clinical, imaging techniques (x-ray, ultrasound scan or Computer tomography) and autopsy. The first step at the registry is to match the incoming data against the register using 'Person Search' in the CanReg 4 software Colman MP and Bieber CA, 1991) to see if the case has already been registered from another source or match it manually against the register using the index card arranged alphabetically by name to avoid double registration or duplication

All malignant neoplasm diagnosed and or treated at the hospital were registered including melanoma and other skin cancers but excluding basal and squamous cell carcinoma of the skin. UITH is a

445-bed capacity tertiary health institution with 17 surgeons (in various subspecialties of surgery), 11gynecologist, 5 pathologists and11 other Laboratory physicians. The hospital has the following cancer diagnostic facilities; pathology laboratories, histopathology, fine needle aspiration cytology and imaging (X-rays ultra sound scans, CT scan and MRI services. Other cancer management services offered by the hospital are surgery, chemotherapy and well organized palliative care

Coding of the primary sites of cancer was according to W.H.O, International Classification of Diseases 10th (ICD-10, Codes C00-C96) revision (WHO, 2000). The data were presented in tables, and pie charts.

RESULTS

A total of 2242 new cancer cases were registered over a period of ten years (1998-2007) at the hospital-based cancer registry of University of Ilorin Teaching Hospital Ilorin given an average of 224 new cases per annum. Histologic verification was possible in 89.6% of the cases. Table I illustrates the sites and sex distribution of cancer cases at our center. The commonest cancers, both sexes being combined, were breast, 553 (24.67%); cervix, 328,(14.63%); liver,242 (10.79%); lymphomas, 212 (9.46%), and prostate, 125(5.56%). Fig 1. Cancer occurred in 852 men and 1390 women giving a male to female ratio of 1:1.63. Hepatocellular carcinoma was the most common cancer in men with 145 (17.02% of all men cancer) cases. This was followed by prostate, 125 (14.67%) and malignant lymphomas, 123 (14.44%) cases. Other common cancers in males were leukemia, renal and floor of the month cancers. Cancer of the testis 2 (0.21%) was low while 5 cases of breast cancer occurred in men and thyroid cancer occurred less in men (10 cases) than women (18 cases). In women the leading malignancies were cancer of the breast, 548 (39.42%); Cervix, 328 (25.43%) and liver, 97 (6.98%). Colorectal, pancreas, and Kaposi sarcoma with 43, 13, and 11 cases respectively occurred more in women than men.

Table II shows the age and site distribution of the new cancer cases registered during the period. The 5th decade age group accounted for about one fifth of all the new cases with 456 (19.89%) cases. Children aged 0-14 years recorded 193 (8.61%) cases, adolescent, 15-34 years, had 328 (14.63%), middle aged group 35-59 years accounted for 48.13% (1079 cases) of the malignancies while the elderly group 60 years and above registered 633 (28.230%) cases, Fig 2. The high incidence of cancer in the middle aged group is due to cancers of the breast, cervix, and liver. Table II also shows distribution of cancer by organs. The mammary gland, breast, topped the list with 553 (5 males and 548 females) cases followed by genital organs, 492 (21.94%), digestive organs, 381 (16.99%) which was dominated by hepatocellular carcinoma, 242 cases and lymphoid and hematopoietic tissues 312 (13.92%) cases. Central nervous system and lung malignancies were low with 3 and 15 cases respectively at our centre.

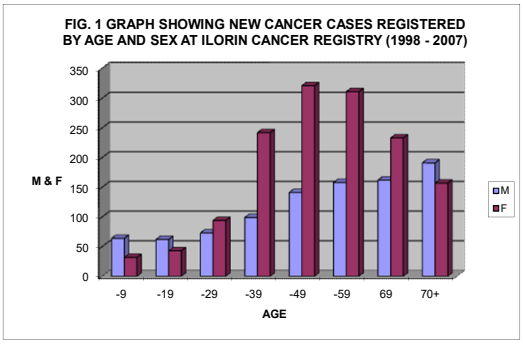
TABLE I: ***NEW CANCER CASES REGISTEERE BY SITES AND SEX AT UITH, ILORIN (1998 - 2007)***

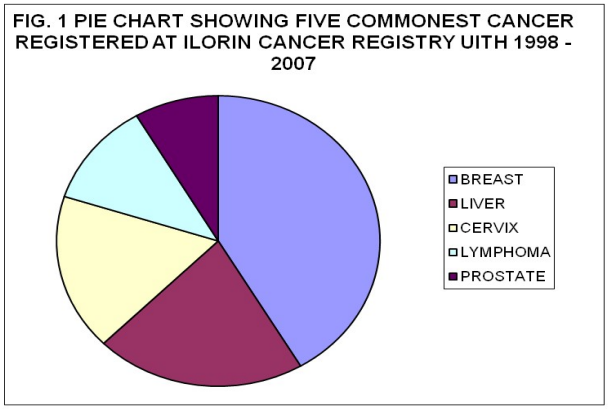
SITES	ICD-10	MALE	FEMALE	TOTAL	%
Lip, Oral cavity & Pharynx	**Coo-C14**	**58**	**30**	**88**	**3.67**
Lip	C00-C00.9	3	7	10	
Floor of the mouth	C04	30	6	36	
Salavary gland	C07-C08	9	8	17	
Pharynx	C09-C13	6	4	10	
Others and unspecified sites	C01-C03, C06-C14	10	5	15	
Digestive organs	**C15-C26**	**202**	**179**	**381**	**20.98**
Esophagus	C15	12	11	23	
Stomach	C16	17	10	27	
Colorectal	C18-C20 '' '' ''	9	43	52	
Liver	C22	145	97	242	
Pancreas	C25	10	13	23	
Other and unspecified sites	C17,C21,C23,C24-C26	9	5	14	
Resp. syst & Intrathoraxic Org.	**C30-C39**	**36**	**23**	**59**	**2.46**
Larynx	C32	4	1	5	
Trachea, Bronchus & lung	C33,C34	12	3	15	
Others-nose, pleura,thymus	C30-C31,C33,C35-C39	20	15	35	
Bone, Articular cartilage	**C40-C41**	**15**	**11**	**26**	**1.08**
Melanoma of Skin	**C43**	**7**	**7**	**14**	**0.58**
Mesothelial & Soft tissue	**C45-C49**	**12**	**20**	**32**	**1.33**
Kaposi's Sarcoma	C46	9	11	20	
Other Connective tissue	C45,C47-C49	5	9	14	
Breast	**C50**	**5**	**548**	**553**	**25.69**
Female genital organ	**C51-C58**	**NA**	**345**	**345**	**14.39**
Cervix uteri	C53	NA	328	328	
Body of Uterus	C54, C5	NA	24	24	
Ovary	C56	NA	20	20	
Others	C51-C52,C54,C57-C58	NA	37	37	
Male Genital Organ	**C60-C63**	**147**	**NA**	**147**	**6.13**
Prostate	C61	125	NA	125	
Testis	C62	2	NA	2	
Others	C60,C63	20	NA	20	
Urinary Tract	**C64-C68**	**34**	**10**	**44**	**1.83**
Kidney	C64	28	5	33	
Bladder	C67	6	5	11	
Eye	**C69**	**20**	**9**	**29**	**1.2**
Brain & CNS	**C70-C72**	**2**	**1**	**3**	**0.12**
Thyroid	**C73**	**9**	**17**	**26**	**1.08**
Unknown Primary Site	**C79-C80**	**125**	**58**	**183**	**8.46**
Malign. Neoplasm of Lymphoid &					
Tissue	**C81-C96**	**123**	**89**	**212**	**7.17**
Hodgkins Disease	C81	18	16	34	
Non Hodgkin's Lymphoma	C82-C85	80	58	138	
Multiple myloma	**C90**	**5**	**5**	**10**	
Leukaemia	**C91-C95**	**52**	**38**	**90**	**3.33**
All Malignant Tumours	**C00-C96**	**852**	**1390**	**2242**	**100**

NA = Not Applicable
ICD10 = International Classification of Diseases 10Th Edition

TABLE II : *NEW CANCER CASES REGISTERED GROUP SITE AND AGE AT ILORIN CANCER REGISTERY (1998 - 2007)*

SITES	ICD-10	4	9	14	19	24	29	34	39	44	49	54	59	64	65+	70+	Unknown	Total	%
Oro-Pharynx	C00-C14	1	12	6	5	3	7	9	2	4	11	6	2	7	8	0	5	88	**3.93**
Digestive organs	C15-C26	1	4	0	5	10	16	36	30	40	61	38	40	58	29	5	8	381	**17**
Resp. system& Intrathoracic Organ	C30-C39	0	2	0	0	0	0	0	5	0	8	13	2	11	10	8	0	59	**2.63**
Bone, Skin &Soft tissue	C40-C49	2	0	6	11	11	2	0	3	11	4	1	8	9	3	1	0	72	**3.21**
Breast	C50	0	0	0	0	13	25	44	73	66	59	66	44	39	29	50	45	553	**24.7**
Genital Organ	C53-C63	1	0	1	0	3	9	21	46	40	61	72	48	54	49	42	45	492	**21.9**
Urinary tract	C64-C68	5	10	0	0	0	0	0	0	5	3	5	6	2	6	0	2	44	**1.96**
Eye	C69	8	7	4	0	0	0	3	0	1	0	4	1	0	1	0	0	29	**1.29**
Brain & CNS	C70-C72	0	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	3	**0.13**
Endocr. Organ	C73-C75	0	0	0	1	1	6	0	3	0	0	4	0	7	1	2	1	26	**1.16**
Lymphoid organ	C81-C90	18	38	31	4	9	0	9	2	36	2	20	5	16	6	8	8	212	**9.46**
Leukemia	C91-C96	2	14	14	8	7	5	7	2	2	6	5	2	6	2	3	15	100	**4.46**
Others, Unknown site	C79-C80	0	0	6	5	10	12	11	11	10	24	33	20	22	5	10	4	183	**8.16**
All cancer sites	C00-C96	38	87	68	39	67	82	140	177	217	239	268	178	231	149	129	133	2242	**100**





DISCUSSION

Cancer is still a major health problem and accounts for one tenth of deaths wordwide[1] Muirs et al (1977) reported that more than half of all cancers occurred among the three-quarters of the world population who resides in the developing countries. Nevertheless, in Nigeria there is a wide gap between cancer burden and a comprehensive cancer control program with inadequate provision for radiotherapy, chemotherapy, and palliative measures. This may be attributed to inadequate knowledge or reliable data about the magnitude of cancer in the country due to dearth of population based cancer registry. Thus, the data reported in this study provide information on cancer profile in Ilorin, a state capital and one of the fast growing biggest cities in the North Central geopolitical zone of Nigeria.

Common Cancers – Cancer is associated with regional differences, thus when both sexes are combined, our study shows that cancers of the breast, cervix, liver, malignant lymphoma, and prostate are the leading cancers, whereas in Transkei, South Africa, esophagus, cervix, breast, and prostate are the commonest cancer ([Parkin DM et al, 2003).. This is at variant in Norway where cancers of the prostate, colorectal, breast, and lung top the list of cancers in that country [Longman F, 2007). Similarly in Victoria, Australia the leading malignancies are prostate, breast, colorectal, and lung (Thursfield V et al., 2005)

Sex Distribution: Our study reveals that cancer occurs more in women than men which corroborates other studies (Parkin DM et al, 2003, Radaniel MTN et al, 2008Ogunbiyi JO et al, 2010,). This is attributed to high incidence of both breast and cervical cancers which accounted for about 40% of all the new cancers registered during the study period. However, this is contrary to reports from developed countries like Norway and Australia where male preponderance is due to prostate and lung cancers (Longman F, 2007, Thursfield V et al., 2005). In Tehran metropolis, male dominance is due to high incidence of cancer of the stomach, prostate, and lung (Mohagheh MA et al 2009). The most frequent cancer in males is hepatocellular carcinoma followed by prostate and lymphomas. Unlike other reports from South Africa and Ibadan where prostate, malignant lymphoma and esophagus are the commonest (Parkin DM et al, 2003, Ogunbiyi JO et al, 2010). This is contrary to what obtains from Zaria which is situated in North-West geopolitical zone of Nigeria, where malignant lymphoma, urinary bladder and colorectal cancers are the leading malignancies in males (Afolayan, 2008). In Kolkata India, the commonest cancers among men are lung, oral cavity and laryngopharyngeal cancers (Sen U et al, 2002). In females cancers of the breast, cervix, and liver are the leading and the commonest malignancies in women, similar to reports from other centers (Ogunbiyi JO, Longman F, 2007). However in South Africa, cancers of the esophagus, cervix, and breast are the commonest in females (Parkin DM et al, 2003). In Norway cancer of the colon is second to breast cancer while cancer of the cervix is not common (Longman F, 2007).

Age Distribution: Cancer is age dependent; however in this study the peak age of cancer occurs at the fifth decade, unlike reports from developed countries where persons over 65 years account for more than 50% of new cancer cases being registered (Curado MP, 2007. T Longman F, 2007, Radaniel MTN et al,2008 ,), Thus, cancer still occurs more at an earlier age in this study when compared with developed countries. Children, under the age of 15 years, account for 9.04% of the total cases. This is higher when compared with other studies (Thursfield V et al., 2005, Curado MP, 2007,) where incidence is less than 1%. The high percentage in children is attributed to high prevalence of Burkitt's lymphoma in the tropics and high percentage, 41%, of children under this age group in African population compared with 28% world wide of cancer (Parkin DM, 2007).

Leading Sites: The leading sites for cancer in our center are breast, cervix, liver and lymphoid tissues. These are followed by prostate and hematopoietic tissue. This is contrary to reports from developed countries which experience prostate, lungs and stomach as the commonest sites (Thursfield V et al., 2005, Longman F, 2007, Radaniel MTN et al, 2008), It is observed that these are sites (breast and cervix) in which early detection of cancer is possible if screening facilities are available or in which preventive measure such as immunization program could reduce the cancer burden.

In conclusion, the data being analyzed in this study are obtained from hospital based cancer registry therefore in order to ensure accurate, ascertain quality and completeness of data on cancer in Nigeria, there is the need for the establishment of a National population- based cancer registry. Similarly, since more than fifty percent of the cancer cases belong to the group in which prevention and early diagnosis are possible, there is the need to institution national control program in order to reduce cancer burden in the country.

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