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CRUDE INCIDENCE OF CHILDHOOD CANCER IN CHILDREN ADMITTED TO THE INSTITUDE OF NUCLEAR MEDICINE MOLECULER BIOLOGY AND ONCOLOGY (INMO)WAD MEDANI ,GAZIRA STATE (1999-2004).

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INTRODUCTION

Over the past 20 years, there has been some increase in the incidence of children diagnosed with all forms of invasive cancer[1]. During this same period, however, death rates declined dramatically and 5-year survival rates increased for most childhood cancers[2]. This improvement in survival rates is due to significant advances in treatment, resulting in cure or long term remission for a substantial proportion of children with cancer[3]. With 90% of the world children living in developing countries, the third world bears the greatest burden of paediatric cancer . Much of the burden of cancer incidence, morbidity and mortality which occur in the developing countries, result from a large epidemiological transition in which the chronic non-communicable disease, once limited to industrialized nations, is now increasing in developing countries. In addition to the accumulating risks associated with diet, tobacco, lack of exercise and industrial exposure, some of these risks are attributed to infectious diseases[3]. These disparities in cancer risk combined with poor access to epidemiological data, research, treatment and cancer control and prevention, have resulted in significantly poor survival rates in developing countries .

Sudan is one of the developing countries which bears such burden. The absence of a population based cancer registry in the country, makes the available data only hospital based and the fact that there are only two centres in Sudan, where patients with cancer are treated, makes knowledge about cancer in Sudan, like other African countries, very sparse, because cancers and other non communicable diseases were thought to be unimportant public health problems due to the high prevalence of communicable diseases.

Despite the problems associated with interpreting data from hospital based registry, we are trying to present a picture as close as possible to the true situation Prevailing now.

The objective of this study is to determine the incidence of childhood cancer in children admitted to the Institute of Nuclear Medicine, Molecular Biology and Oncology (INMO). Gezira State, Sudan

DESIGN AND METHOD:

This is a retrospective study using hospital records. All children with cancer, aged 1 – 15 years diagnosed by means of histological or cytological examination admitted to the (INMO) during the period May 1999 – December 2004 were included in the study.

Gezira is the second largest state in Sudan and according to the (ICCCC) ensus of (1993) total population was 3,962,000. The number of children less than 15 years approximately 1,730,844. It has 13 secondary level hospitals, 36 rural hospitals and 150 health centers. Gezira state was considered the richest state in the country before the discovery and extraction of oil. (INMO), which was founded in 1993, has a new department which was established in 1997 to manage and care for cancer patients in a modern multidisciplinary approach. It cares for the patients with cancer from Gezira state and the surrounding states in the central region of Sudan.

SPSS (Statistical Package for Social Sciences) was used for statistical analysis .Descriptive statistis was used to obtain the crude incidence rate of cancer per 100 children per year ,and cross tabulation and frequencies for calculation of prevalence.

The classification of childhood cancer in this study was based on the International Classification of Childhood Cancer (ICCC))[17], in which there are 12 main diagnostic groups: leukemia, lymphoma, reticuloendothelial neoplasm, central nervous system and miscellaneous intracranial and intraspinal neoplasms, retinoblastoma, renal tumors, hepatic tumors, malignant bone tumors, soft tissue sarcomas, germ cell, trophoblastic and other gonadal neoplasms.

The patterns of cancer were examined with a focus on cancer prevalence and sex.

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RESULTS

Table 1 shows the classification of childhood cancers according to the in patients admitted to INMO during the period (May 1999 – Dec 2004). Lymphoma was the most prevalent cancer (40.9%), followed by acute leukaemia (23.8%) and kidney tumors (12.2%).

Table 2 shows the prevalence of childhood cancer. In our study it was higher among boys (61%) than girls (39%). Table 3 shows the crude incidence of childhood cancers per year. It showed an increasing incidence of cancer which is rising from 5.6% in 1999 to 7.3% in 2004.

Table 1 :Classification of Childhood cancers by site and sex according to (ICCC) (n 163)

Cancer Type	Sex		Total
	Female	Male	
Leukaemia	13 7.9%	26 15.9%	39 23.8%
Lymphoma	19 11.6%	47 29.3%	66 40.9%
CNS tumor	1 0.6%	0 0	1 0.6%
Sympathetic NC tumor	4 2.4%	4 2.4%	8 4.8%
Retinoblastoma	1 0.6%	2 1.2%	3 1.8%
Renal tumors	12 7.3%	8 4.9%	20 12.2%
Hepatic tumors	2 1.2%	0 0	2 1.2%
Malignant bone tumors	2 1.2%	5 3.0%	7 4.2%
Soft tissue sarcomas	4 2.4%	2 1.2%	6 3.7%
Germ cell, trophoblastic, other gonadal neoplasm	5 3.0%	0 0	5 3.0%
Carcinoma, other malignant epithelial neoplasm	1 0.6%	3 1.8%	4 2.4%
unspecified malignant neoplasm	0 0	1 0.6%	1 1.6%
Not classified by ICCC	0 0	1 0.6%	1 0.6%
TOTAL	64 39%	100 61%	163 100%

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Table 2: Incidence of different Cancer Type

Type	YEARS						Total
	1999	2000	2001	2002	2003	2004	
Leukaemia	3 7.7%	6 15.4%	5 12.8%	5 12.8%	9 23.1%	11 28%	39 100%
Lymphoma	5 7.6%	5 7.8%	19 28.8%	15 22.7%	6 9.1%	16 24%	66 100%
Renal tumor	2 10.0%	3 15.0%	3 15.0%	6 30.0%	2 10.0%	4 20%	20 100%
Sympathetic NC tumor	1 12.5%	1 12.5%	2 25.0	3 37.5		1 13%	8 100%
CNS tumor		1 100%					1 100%
Retinoblastoma		2 66.7%			1 33.3%		3 100%
Hepatic tumors		2 100%					2 100%
Malignant bone tumor				3 42.9%	2 28.6%	2 29%	7 100%
Soft tissue sarcomas			2 33.3%	1 16.7%	2 33.3%	1 17%	6 100%
Germ cell, trophoblastic,			1 20.0%	2 40.0%		2 40%	5 100%
Carcinoma, other malignant epithelial		1 25.0%		2 50.0%		1 25%	4 100%
unspecified malignant neoplasm					1 100%		1 100%
Not classified by ICCC					1 100%		1 100%
Total	11 6.7%	21 12.9	32 19.6%	37 22.7%	24 14.7%	38 23%	163 100%

Table 3: Incidence of childhood cases per year

Year	No of children	Total no of cancer cases	%
1999	11	197	5.6
2000	21	300	7.0
2001	32	364	8.8
2002	37	402	9.2
2003	24	451	5.3
2004	38	520	7.3
Total	163	2234	7.3

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DISCUSSION

Cancer remains one of the leading causes of morbidity and mortality worldwide. It is predicted that by 2020, the number of new cases of cancer worldwide will increase to more than 15 million, with deaths increasing to 12 million, [4]. Data indicate that developed countries have an increased incidence of leukaemia and brain tumors which accounted for over half of new cases[1,8,9,10,11] about one third is leukaemia with a decreased incidence of lymphomas [1,5,8,9,10,11,16]. In our study lymphomas and leukemia's form about two thirds of childhood cancers. There are few studies concerning cancer incidence rate in Sudan. The first one was done by Hussain in the capital Khartoum (1988)[14]. Other unpublished studies were done in Sudan about clinical patterns of childhood cancer, but all are hospital based studies[19,20,21,22]. However, they showed the same patterns. The pattern of childhood cancer in Gezira and Khartoum is similar to that of the African and Middle East countries[6,7,12,13,15,17,19,22,] and is different from that of Western countries and North America , with lymphoma and leukaemia forming about two thirds of cancer in children admitted to INMO.

This variation in the pattern of childhood cancer in developed and developing countries is due to the fact that in underdeveloped countries epidemiological studies of lymphoma in children less than 15 years is associated with infectious causes. The role of Epstein Barr Virus (EBV) is supported by serological studies and the frequent presence of EBV genome in biopsy material[18,22]. For Burkett's lymphoma, EBV genome is present in tumor cell in 95% of cases in equatorial Africa compared with 15% in the United States[18].Immunodeficiency either congenital or acquired increases the risk of developing Hodgkin disease[18], epidemiological studies have also implicated pesticide exposure as a possible risk factor[18] and Gezira state, which harbors the largest agriculture scheme in Africa and Middle East, may be affected by the pesticides, an area which needs further study.

The ratio of boys to girls in our study is 1.6:1 which agrees with the African trend[3,7,17,23]. But differs from the trend in Western countries, where the male to female ratio is 1:1[6,10,23],.
The ratio of boys to girls with childhood cancer in developing countries is affected by the decreasing gross domestic product, suggesting that boys are more likely to be affected than girls with increasing economic disadvantages[23].

As in other parts of the world, Sudan is showing an increasing incidence of cancer.

The drop in the crude incidence rate of year 2003 is possibly due to the fact that during that year there was a problem concerning the availability of drugs, and most of the patients were referred to be treated in Khartoum.

CONCLUSIONS

We concluded that cancer incidence in children is increasing in Gezira state with higher crude incidence of lymphomas. This is similar to other African and Middle East countries and different from Europe and North America. A population based cancer registry is needed in ordre to have proper data on incidence ,morbidity and mortality.

REFERENCES:

1. American Cancer Society, National Cancer Institute Cancer facts & Figures, Retrieved March 2005 from http://www.cancer.org.
2. Ries LAG, Eisner MP, Kosaryd, et al. SEER Cancer Statistics Review 1972 – 2002 National Cancer Institutes, Bethesda MD, 2005.
3. Usamani G, Naheed MD, Current Opinion in Pediatrics' oncology in the third world 2001; 13(1): 1-9.
4. Kanavos. The rising burden of Cancer in the developing world. Ann. Oncol. 2006; 17: 815- 823.
5. Mutal Res. 2006; 28: 608(2) 100-1100 Eput. 2006 July 18 Review

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6. Hery .Ekert.Childhood Cancer Understanding and Coping .Grand and BreachScience Publisher:2003.
7. Makata AM, Toriyama K; Kamidigo NO, ETO. H, Hakura H. The pattern of pediatric solid malignant tumors in western Kenya, East Africa 1979-1994: An analysis based on histopathologic study. Am J. Trop. Med. Hyg. 1996 Apri; 54(4): 343-7.
8. Drifaldt AC, Carberg M, Hardell L. Increasing incidence rates of childhood malignant disease in Sweden during the period 1960 – 1998, Eur J. Cancer Paed., 2004 40(9): 1351-60.
9. Plesko I, Somogyi J, Dimitrova E, Kramarova E. Descriptive epidemiology of childhood malignancies in Slovakia. Neoplasm 1989; 36(2): 233-43.
10. Gonzalez JR, Fernadez E, de Toledo Js, Galceran J Peris M, Gispe Borras JM. Trendes in childhood cancer incidence and mortality in Catalonia Spain, 1975-1990. Eur J Cancer Paed. 2004 Feb; 13(1): 47-51.
11. Greenberg ML, Barr RD, Di Monte B, Mslaughlin E, Greeberg C. Childhood cancer registries in Ontario, Canada: leasons learned from a comparison of two registries, Int J cancer 2003;20.105(1): 88-91.
12. Chintu, Chifumbe, Athale, Uema H, Patil PS childhood cancers in Zambia before and after the HIV epidemic, Archives of Disease in childhood 1995; 73(2): 100-104.
13. Getachew A, malignant lymphoma in Western Ethiopia, East Afri, Med. J. 2110 Aug; 78: 402-4.
14. Hussain MAW, Abbas FEM. Ahmed HM: malignant disease in Sudanese children, East Afri Med. J. 1988; 65 : 507-514.
15. Edwin K Wiredu, Henry B Armah. Cancer mortality patterns in Ghana a 10 years review of autopsies and hospital mortality BMC Public Health 2006; 6: 156 – 167.
16. Nquyen MQ, Ngu Yen CH, Krumarova E, Porkin DM. Incidence of childhood Cancer in Hochi Minh city Vitenam 1995 – 97. Paeditr Perinat Epidemiol. 2000 Jul; 14(3): 240-7.
17. D.M. Parkin, J. Ferlay, M. Hamid-Cherif, F. Sitas, J.O. Thomas, H. Wabinga, S.L. Whelan. Cancer in Africa epidemiology and prevention 2003; 318.
18. Beherman,Kliegman,Jenson.Nelson text book of paediatics Saunders Publisher.17th edition 2004.
19. B.A. Elsherif. The Pattern of Malignant disease in children presenting to Khartoum Hospital. (dissertation) University of Khartoum ;1983.
20. S.H. Bushara. Clinical Pattern of Leukaemia in Children and Immediate Response to Treatment. (dissertation) . University of Khartoum; 2000.
21. G.S. M.Abdalla. Clinical Pattern of Malignant Disease in Children and Psychosocial Impact on Families and their children(dissertation) University of Khartoum;. 2000.
22. S.M. Babiker. Epidemiology, Clinical Pattern of Lymphoma and Immediate Response to Treatment in Sudanese children.(dissertation) University of Khartoum; 2002.
23. Pearce.M.S.,Parker.L.Childhood Cancer Registration in The Developing World.Int J Cancer;2001 .91(3):402-406