

Pattern and Outcome of Pediatric Leukemia and Lymphoma among Cancer Children Admitted to King Khalid Hospital in Hail Region, Saudi Arabia – Hospital Based Study.

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ABSTRACT

Background: Cancers form one of the major causes of mortality and morbidity in children between the ages of one and 15 years. Childhood cancers are histologically more diverse than adult cancers; they differ in type, distribution, etiology and prognosis from adult cancers. Childhood cancers are more influenced by genetic and environmental factors. The patterns of childhood cancers in America and Europe are almost similar, where leukemia tumors accounting for over one-half of cancer cases. In contrast, lymphoma is the most common prevailing cancer among children in Africa. The objective of this study is to determine the patterns of childhood tumors in Hail region, Saudi Arabia. **Methods:** This was a retrospective descriptive study conducted in King Khalid hospital, Hail, Kingdom of Saudi Arabia (KSA) during the period from October 2016 to March 2017. A full coverage of data regarding leukemia and lymphoma were retrieved from the hospital. Obtained data were filled in standard form prior to analysis. The study was approved by ethical committee at college of medicine, university of Hail. Data were analyzed using SPSS software version 16. P value < 0.05 was considered statistically significant. **Results:** The results showed a pattern of childhood leukemia as the most common cancer (60.8%). The prevalence of cancer was found to be higher among males (58.3.7%) than females (41.7%) with a rate of 1.3:1. Most of the children admitted with cancer were from Hail region (63.3%). Majority (41.7%) of cancer children had good prognosis and were discharged home. **Conclusion:** Hematological malignancies were the most common form of cancer among our patients. The pattern of childhood tumors showed wide variation during the study.

Keywords: Leukemia, Lymphoma, Pattern, characteristics, Cancer

INTRODUCTION

Childhood cancers represent one of the leading causes of death within the pediatric and adolescent age group.^[1] More than 10% of all deaths in children below 15 years of age are caused by malignant diseases. Pediatric cancer differs markedly from adult cancer in their nature, distribution and prognosis. In addition, pediatric oncologists face unique challenges because treatment with irradiation, surgery and chemotherapy can adversely affect the children's growth and development. The incidence of childhood cancers and type vary greatly throughout the world. The overall incidence rate for childhood cancers has increased significantly by almost 33% during the period 1975 to 2001.^[2] Though it is

lower compared with the incidence of some adult cancers, it comes next to accidents as the leading cause of death among children in the developed world.^[1] The pattern of childhood cancer in America and Europe are almost the same, with leukemia and tumors of the central nervous system accounting for over one-half of the cases. Many papers have been published on pattern of pediatric cancer in some Arab countries,^[2-9] However, reports on pattern and incidence of childhood cancer in Saudi Arabia are very few. The objective of this study is to determine the patterns of childhood cancer in Hail Region, Saudi Arabia.

MATERIALS AND METHODS

We conducted a retrospective, descriptive, cross-sectional study using hospital records to study patterns and outcomes of pediatric tumors among 120 pediatric patients between 0-18 years old, who were diagnosed with lymphoma or leukemia by means of histological or cytological testing and

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admitted to the pediatric department at King Khalid Hospital in Hail Region, in Saudi Arabia, between 2008 and 2016. The study focused on the prevalence, outcomes, and patterns of leukemia and lymphoma. Data were obtained from the records and entered into an Excel spread sheet and categorized according to frequency of pediatric malignancies in different age groups, sex, geographic distribution and types of tumors using the International Classification of Childhood Cancer (ICCC). Formal approval was obtained from College of Medicine in University of Hail. Statistical analysis of the data was done using SPSS version 16.0. Descriptive statistics i.e. mean \pm standard deviation for numerical values and frequencies along with percentages for categorical variables were used to describe the data. Linear regression analysis was used to explore the associations. A P value of <0.05 was considered statistically significant.

RESULTS

The records of 120 cancer pediatric patients satisfied the inclusion criteria were reviewed. The mean age was 5.6 years. Males (58.3%) were more affected than females (41.7%). The results showed a pattern of childhood cancer in patients admitted to King Khalid Hospital during the period (2008 – 2016). Leukemia was more prevalent (60.8%) than lymphomas (39.2%). Of all tumors, acute lymphoblastic leukemia (ALL) was the most common hematological malignancy. It accounts for 33.3% of total malignancies among patients admitted to the department during study period with peak incidence at the age group 1 - 4 years in 2010 and 2015. Most of the children admitted with cancer came from the Hail region (63.3%) compared to 36.7% from nearby villages. Regarding lymphomas, Non-Hodgkin lymphoma was the most common pattern of lymphomas. It is accounting 28% of lymphoma cases in males and 15% in females. There was no significant association between gender and the types of cancers ($P=0.527$).

DISCUSSION

Cancer, a common disease in adults, is rare in children and adolescents, less than 1% of all malignancies occur in pediatric patients and only one case of cancer is encountered annually among 10,000 children aged 0 through 15 years. Although the causes of childhood cancers are largely unknown, a few conditions can be explained with specific chromosomal and genetic abnormalities, and ionizing radiation exposure. Environmental causes have been suspected by many scientists but have been difficult to determine because it is difficult to identify past exposure levels in children particularly during potentially important periods such as pregnancy or even the time prior to conception. In

addition, each of the distinctive types of childhood cancers develops unique clinical course in terms of age, race, gender and many other factors.^[15]

It has been shown that in many developing countries, the reported prevalence of childhood cancer in boys is substantially higher than in girls. The ratio of boys to girls registered with childhood cancer, increased with decreasing gross domestic product and with increasing infant mortality, suggesting that boys are increasingly more likely to be affected than girls with increasing economic disadvantages.^[10] The ratio of boys to girls in our study is 1.3:1 which agrees with the African trend but differs from the trend in western countries where the female to male ratio is 1:1.^[10-12]

The pattern of the cancer in Hail region-Saudi Arabia is like other Arab countries, with Leukemia as the commonest. This was also the pattern found in a study conducted in.

The distribution of the most common three cancers according to age and gender in our study, is in consonance with international trends for leukemia as a common cancer in children aged less than fifteen years, with Acute Lymphoblastic Leukemia (ALL) being twice more common in males than in females. Similar to other studies,^[9-12] there was no significant relationship of the prevalence of different types of cancer in relation to age or gender.

CONCLUSION

In this study it was evident that the pattern of cancer in Hail region is similar to other Arab and Western countries. Leukemia was found to be the most common cancer in Hail region, with males three times more affected than females. There is a need for research to determine the annual incidence of different cancers in children in Saudi Arabia and determine mortality and five year survival rates. Also a detailed study of environmental risk factors is necessary.

REFERENCES

1. American Cancer Society. Cancer Facts and Figures. 2005.
2. Ojesina AI, Akang EE, Ojemakinde KO. Decline in the frequency of Burkitt's lymphoma relative to other childhood malignancies in Ibadan, Nigeria. *Ann Trop Paediatr.* 2002; 22(2):159–63.
3. Makata AM, Toriyama K, Kamidigo NO, Eto H, Itakura H. The pattern of pediatrics solid malignant tumors in western Kenya, east Africa, 1979-1994: an analysis based on histopathologic study. *Am J Trop Med Hyg.* 1996; 54(4):343–7.
4. Chintu C, Athale UH, Patil PS. Childhood cancer in Zambia before and after HIV epidemic. *Arch Dis Child.* 1995; 73(2):100–4.
5. Mukibi JM, Banda L, Liomba NG, Sungani FC, Parkin DM. Spectrum of childhood cancer in Malawi 1985-1993. *East Afr Med J.* 1995;72(1):25–9.
6. Akhtar SS, Abu Bakr MA, Dawi SA, Hug IU. Cancer in Libya – a retrospective study (1981-1985) *Afr J Med Sci.* 1993; 22(1):17–24.

7. Fischer PR, Ahuka Lo, Wood PB, Lucas S. Malignant tumors in children of northeastern Zaire. A comparison of distribution pattern. *Clin Pediatr.* 1990; 29(2):95–8.
8. Obioha FI, Kaine WN, Ikerionwu SE, Obi GO, Ulasi TO. The pattern of childhood malignancy in eastern Nigeria. *Ann Trop Paediatr.* 1989; 9(4):261–5.
9. Bella AE. The pattern of malignant disease in children presenting to Khartoum Hospital (dissertation) Khartoum hospital: Khartoum University. 1983
10. Pearce MS, Parker L. Childhood cancer registrations in the developing world: still more boys than girls. *Int J Cancer.* 2001; 91(3):402–6.
11. Plesko I, Somogyi J, Dimitrova E, Kramaroki Descriptive epidemiology of childhood malignancy in Slovakia. *Neoplasms.* 1989; 36(2):233–43.
12. Gonzalez JR, Fernandez E, de Toledo Js, Galceran J, Peris M, Gispè BJM. Trends in childhood cancer incidence and mortality in Catalonia Spain 1975-1998. *Eur J Cancer Prev.* 2004;13(1):47–51.
13. Makata AM, Toriyama K, Kamidigo NO, Eto H, Itakura H. The pattern of pediatric solid malignant tumors in western Kenya, east Africa, 1979-1994: an analysis based on histopathological study. *Am J Trop Med Hyg.* 1996; 54(4):343–7.]
14. Tijani SO, Elesha SO, Banjo AA. Morphological patterns of paediatric solid cancer in Lagos, Nigeria. *West Afr Med J.* 1995; 14(3):174–8.
15. Levi F, Lavecchiac, Lucchini F, Negri E, Boyle P. Patterns of childhood cancer mortality: America, Asia and Kenya. *Eur J Cancer.* 1995; 31A(5):771–82.
16. Mukiibi JM, Nyrenda CM, Adewuyi JO, Mzula EL, Magombo ED, Mibvundula EM. Leukaemia at Queen Elizabeth Central Hospital in Blantype, Malawi. *East Afr Med J.* 2001; 78(7):349–54.

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