

## EPIDEMIOLOGY OF CHILDHOOD CANCER AT CENTRAL ZONE OF VIET NAM

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### ABSTRACT

**Background:** Worldwide, childhood cancer is rare. In addition, a distinct variation in incidence, type distribution and the demographics. We conducted a study on the epidemiology of childhood cancer at Central Zone of Vietnam, in two hospitals: Hue Central Hospital and Danang Hospital of Women and Children, during the period of April 2014 - July 2019.

**Methods:** It is a retrospective study. The analyzes were performed retrospectively using medical files. The number of new cases, the proportion of different cancers, sex ratio, age at diagnosis were the epidemiological factors studied.

**Results:** A total of 403 new cases of childhood cancer were admitted two hospitals during April 2014 and July 2019, with a male to female ratio of 1.65/1. The median age was 4 years (range 1.5 months to 15.3 years old). Boys showed higher percentage than girls in most of malignant diseases. The ratio of male/female in acute lymphoblastic leukemia, acute myeloid leukemia, neuroblastoma, lymphoma, hepatoblastoma and renal tumor were 1.81/1, 1.61/1, 2.4/1, 1.06/1, 1.75/1 and 3.18/1 respectively. The number of patients increased gradually by years, with the percentage of patients in 2015, 2016, 2017 and 2018 were 15.6%, 18.4%, 19.6% and 21.1% respectively. Leukemia was the most common type of childhood cancer accounting for 66.5%, in which there were 46.4% acute lymphoblastic leukemia and 20.1% acute myeloid leukemia, followed by neuroblastoma (8.4%), and lymphoma (8.2%). Quang Nam was the city which had the biggest percentage of children with cancer admitted to hospitals (25.6%).

**Conclusions:** Childhood cancer incidence appears to be increasing in Central Zone of Vietnam and boys showed higher percentage than girls in each type of cancer and each age groups.

**Key words:** Cancer, Childhood, Epidemiology.

### I. INTRODUCTION

Cancer is a leading cause of death for children and adolescents around the world and approximately 300.000 children aged 0 to 19 years old are diagnosed with cancer each year. The most common categories of childhood cancers include leukemias, brain cancers, lymphomas and solid tumours, such as neuroblastoma and Wilms tumour. In high-income countries more than 80% of children with

cancer are cured, but in many low- and middle-income countries only about 20% are cured [10]. Childhood cancer generally cannot be prevented or screened. Some literatures showed that 43% of childhood cancer cases were undiagnosed globally, with substantial variation by region, ranging from 3% in western Europe and North America to 57% in western Africa. In south Asia, the overall proportion of undiagnosed cases was estimated to be 49% [11].

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Accurate estimates of childhood cancer incidence are important for policy makers to inform priority setting and planning decisions. However, many countries do not have cancer registries that quantify the incidence of childhood cancer. In Vietnam, we don't have national registry, some hospitals can have registries for themselves. And in some studies, they showed the percentage of male was more predominant than female.

We conducted a study on the epidemiology of childhood cancer at Central Zone of Vietnam, in two hospitals: Hue Central Hospital and Danang Hospital of Women and Children, during the period of April 2014 - July 2019.

## II. PATIENTS AND METHODS

### 2.1. Patients

The study population was children aged less than 16 years old who were diagnosed cancer at Hue Central Hospital and Danang Hospital of Women and Children during the period from April 2014 to July 2019.

### 2.2. Methods

This was a descriptive retrospective study done for the period from April 2014 to July 2019 based on medical records. The present study was approved by the Hue Central Hospital Review Board and conducted in compliance with the ethical standards of the responsible institution on human subjects as well as with the Helsinki Declaration.

Statistical analysis: Data were analyzed using Medcalc program.

## III. RESULTS

The total number of children with cancer that were

newly diagnosed during the time from April 2014 to July 2019 was 403 patients. There were 251 boys and 152 girls, the ratio of male/female was 1.65/1. The median age was 4 years (range 1.5 months to 15.3 years old), 55.8% of them were aged 0 - <5 years, 28.3% aged 5-<9 years, and 15.9% were 9-16 years of age. The ratio of male/female in each age group: 0 - <5 years, 5-<9 years, 9-16 years of age were 1.85/1, 1.43/1 and 1.46/1 respectively (**table 1**).

Leukemia was the most common type of childhood cancer accounting 66.5% (in which there were 46.4% acute lymphoblastic leukemia and 20.1% acute myeloid leukemia), followed by neuroblastoma (8.4%), lymphoma (8.2%) and renal tumor (5.2%). The least common type of cancer was osteosarcoma (0.2%). The ratio of male/female in acute lymphoblastic leukemia, acute myeloid leukemia, neuroblastoma, lymphoma, hepatoblastoma and renal tumor was 1.83/1, 1.61/1, 2.4/1, 1.06/1, 1.75/1 and 3.18/1 respectively (**table 2**).

The number of patients increased gradually by years, with the percentage of patient in 2015, 2016, 2017 and 2018 were 15.6%, 18.4%, 19.6% and 21.1% respectively. In the year 2019, we surveyed in 7 months, so the number was lower in other years (**table 3**).

Regarding location, the patients came from 13 cities including Hue, Danang, Quang Nam, Quang Binh, Quang Tri, Quang Ngai, Ha Tinh, Kontum, Dak Lak, Binh Dinh, Phu Yen, Dong Nai and Sai Gon. There were some patients came from the south of Vietnam. There were 4 cities with the highest percentage of patients listing: Quang Nam (25.6%), Hue (20.8%), Danang (18.4%) and Quang Tri (12.7%).

*Table 1: Age and sex specific percentage*

Variables	Male	Percentage (%)	Female	Percentage (%)	The ratio of male/female
0 - < 5 years old	146	64.9	79	35.1	1.85/1
5 - < 9 years old	67	58.8	47	41.2	1.43/1
9 - 16 years old	38	59.4	26	40.6	1.46/1

*Table 2: The ratio of male/female in some common malignant diseases*

<b>Variables</b>	<b>Male</b>	<b>Percentage (%)</b>	<b>Female</b>	<b>Percentage (%)</b>	<b>The ratio of male/female</b>
Acute lymphoblastic leukemia	121	64.7	66	35.3	1.83/1
Acute myeloid leukemia	50	61.7	31	38.3	1.61/1
Neuroblastoma	24	70.6	10	29.4	2.4/1
Lymphoma	17	51.5	16	48.5	1.06/1
Hepatoblastoma	7	63.6	4	36.4	1.75/1
Renal tumor	16	76.1	5	23.9	3.18/1

*Table 3: Distribution of cancer during 2014-2019*

<b>Variables</b>	<b>Number</b>	<b>Percentage (%)</b>
2014	53	13.2
2015	63	15.6
2016	74	18.4
2017	79	19.6
2018	85	21.1
2019 (7 months)	49	12.2
Total	403	100

#### **IV. DISCUSSION**

In our study, we knew the total number of children with cancer that were newly diagnosed during the time from April 2014 to July 2019 was 403 patients. However, it was difficult to have the overall incidence rate of childhood cancer, because some reasons such as: we could know the population of central zone of Vietnam, however, there were some cities, in which, some of patients were transferred to Hue Central hospital, and some other patients were transferred to other hospitals. Contrast to us, Al-Asadi showed there were 723 new cases of childhood cancer were registered during 2012-2016 in Basrah, with the overall incidence rate was 13.74/100.000 [1]. Erdmann and Kaatsch showed the overall age-standardized incidence rates were 140/million and 130-160 case/million children respectively [5], [7]. And in Shanghai, the crude incidence rate was 12,90/100.00 [3].

Regarding gender distribution, childhood cancer is more common among males than females. In this study, males constituted 62.3% of

the study population with a male to female ratio 1.65:1. Similarly in Northwest Iran, Fathi showed the male to female ratio was 1.6/1 [6]. While in Shanghai, China, and Saudi Arabia, the male to female ratio were 1.2/1 and 1.3/1 respectively [2], [3].

Boys showed higher percentage than girls in each type of cancer and each age groups. The ratio of male/female in acute lymphoblastic leukemia, acute myeloid leukemia, neuroblastoma, lymphoma, hepatoblastoma and renal tumor was 1.83/1, 1.61/1, 2.4/1, 1.06/1, 1.75/1 and 3.18/1 respectively. The median age was 4 years (range 1.5 months to 15.3 years old), 55.8% of them were aged 0 - <5 years, 28.3% aged 5-<9 years, and 15.9% were 9-16 years of age. The ratio of male/female in each age group: 0 - <5 years, 5-<9 years, 9-16 years of age were 1.85/1, 1.43/1 and 1.46/1 respectively. Similarly, there were some researches had the same part of results [1], [2], [8]. Genetic differences in immune function or behavioral related factors might be responsible for such difference between boys and girls [6].

The observed distribution of pediatric cancer

types in this study resembles that noticed in developing countries. Leukemia was the most common type and ranks first as the top childhood cancer [4], [7],[9].

The number of patients in our study increased gradually by years, with the percentage of patients in 2015, 2016, 2017 and 2018 were 15.6%, 18.4%, 19.6% and 21.1% respectively. Similarly, Al-Mutlaq, Al- Asadi had the same results [1], [2]. It could be explained due to probable exposure to some specific risk factors such as radiation, pesticides and

chemical related to automobiles and other sources can not be excluded.

### V. CONCLUSION

Childhood cancer incidence appears to be increasing in Central Zone of Vietnam and boys showed higher percentage than girls in each type of cancer and each age groups. We would like to further our study with larger population in whole my country, so we can know demographics of Vietnamese childhood cancer patients.

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