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## Childhood malignancies in Chulalongkorn Hospital from 1986 to 1989

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*With the rapid industrialization of Thailand, the incidence of cancer is expected to be come increasingly higher. Statistical data on childhood malignancies at Chulalongkorn Hospital during the period 1986 to 1989 is presented, with analysis by sex, age group, and residential location of patients with each type of cancer. Overall 220 malignant tumors were diagnosed in 134 male and 86 female patients. Leukemia and lymphoma accounted for 43.2% of the cases, central and sympathetic nervous system cancers for 24.7%. There were 79 cases (35.9%) from Bangkok and 87 cases (39.5%) from the central region of the country. There were a relatively high number of cases, i.e. 21 (9.5%) from Chon Buri. There were also clusters of cases of neuroblastoma, three from Lop Buri and of retinoblastoma, three from Phetchaburi.*

*Key words : Chulalongkorn Hospital, Childhood malignancy, Cancer.*

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อิโรชิ จันทาภากุล, อลิสา ลิ้มสุวรรณ, วีรพันธ์ โชวิฑูรกิจกิจ, สิบสันต์ สิงห์ภักดิ์. อุบัติการณ์ผู้ป่วยโรคมะเร็งในเด็กที่โรงพยาบาลจุฬาลงกรณ์ตั้งแต่ปี พ.ศ. 2529 ถึง พ.ศ. 2532. จุฬาลงกรณ์เวชสาร 2534 ธันวาคม ; 35(12): 823-829

ประเทศไทยกำลังมีการพัฒนาทางอุตสาหกรรมอย่างรวดเร็วและคาดว่าจะมีอุบัติการณ์ของโรคมะเร็งเพิ่มมากขึ้น รายงานนี้รวบรวมสถิติผู้ป่วยโรคมะเร็งในเด็กที่เข้ารับการรักษาที่โรงพยาบาลจุฬาลงกรณ์ตั้งแต่ปี พ.ศ. 2529 ถึง พ.ศ. 2532 พร้อมทั้งแยกแยะข้อมูลเกี่ยวกับเพศ อายุ และที่อยู่ของผู้ป่วย มีผู้ป่วยทั้งสิ้นรวม 220 คน เป็นชาย 134 คน หญิง 86 คน พบโรคมะเร็งเม็ดเลือดขาวและมะเร็งต่อมน้ำเหลืองมากที่สุดคือ 43.2% มะเร็งของระบบประสาท 24.7% ผู้ป่วยที่มีบ้านอยู่กรุงเทพมหานครมากที่สุดคือ 79 ราย และจากภาคกลางของประเทศ 87 ราย หรือ 35.9% มีผู้ป่วยจำนวนค่อนข้างมากคือ 21 ราย หรือ 9.5% จากจังหวัดชลบุรี มีกลุ่มโรคสูงผิดปกติของโรค Neuroblastoma จำนวน 3 ราย ที่จังหวัดลพบุรี และโรค Retinoblastoma จำนวน 3 ราย ที่จังหวัดเพชรบุรี

Thailand is rapidly developing, both economically and technologically. In the medical field, even though public health promotion and the eradication of communicable diseases are being emphasized, medical personnels have only recently started to pay more attention to other common noncommunicable diseases such as heart disease and malignancy. Most of the patients with malignant diseases in Thailand are treated at only a few major provincial hospitals and university hospitals because of the high cost of chemotherapy and the lack of equipment for radiation therapy at the smaller medical centers. There is little cooperation between the hospitals in this regard and there are no detailed epidemiological data on malignant diseases from the national tumor registration program in Thailand, which would be essential for cancer prevention. Chulalongkorn Hospital is one of the major university hospitals in Bangkok; it has more than 1,250 inpatient beds and 35,000 pediatric patients are seen at the outpatient department each year. Regarding cancer therapy, it is one of the major referral centers in Thailand, with comprehensive therapy: surgery, radiation therapy and chemotherapy. This report presents the prevalence of childhood malignancy at Chulalongkorn Hospital, mostly representing the population living in Bangkok metropolitan area and the central region of the country.

## Method

The data presented in this report concern tumors specified as malignant and first diagnosed in children under 15 years of age who visited Chula-

longkorn Hospital between 1986 to 1989, for treatment departments including pediatrics, surgery, radiology, ophthalmology and orthopaedics. The data also include patients diagnosed and referred for further treatment in that same period from other hospitals in several parts of Thailand. According to the referral system in Thailand, these data represent malignancy in children mainly from the central, eastern and northeastern regions of the country.

Cancer cases were ascertained from hospital inpatient records, pathology reports, radiotherapy records, outpatient clinic records, cancer registries, and medical record indices. An intensive effort was made to investigate each patient to confirm the diagnosis and determine the date on which it was made. Diagnoses classified as in situ tumors and benign tumors which do not threaten life are excluded from this analysis.

All abstracts received were reviewed before data processing for completeness and the validity of all items. Selected items on individual documents were checked for compatibility, such as site/sex, site/histologic type and date of birth/age. All documents for each patient (e.g. multiple hospital admissions) were compared for consistency of birth date, age, sex, primary site, histologic type and date of diagnosis.

## Results

From the retrospective data obtained during the four year interval, 220 malignant tumors were diagnosed in 134 male and 86 female patients. Table 1 shows the distribution of the 220 cancer cases according to histological type and sex.

**Table 1.** Prevalence of childhood malignancy at Chulalongkorn Hospital during 1986-1989.

	1986	1987	1988	1989	Total (%)	USA(%) <sup>(1)</sup>	M/F(Thai)	M/F(USA) <sup>(2)</sup>
Acute Lymphoblastic Leukemia	20	8	20	20	68(30.9)	21.7	1.7	1.4
Acute Nonlymphocytic Leukemia	4	1	3	5	13(5.9)	4.3	1.6	1.1
Chronic Myelogenous Leukemia	—	1	—	2	3(1.4)	0.9	2.0	4.0
Lymphoma	2	4	2	3	11(5.0)	12.3	2.7	2.0
Wilms' tumor	1	3	5	2	11(5.0)	6.3	1.2	1.1
Neuroblastoma	2	6	5	3	16(7.3)	8.1	1.7	1.3
Brain tumor	10	12	15	7	44(20.0)	19.0	1.3	1.2
Liver tumor	1	—	1	2	4(1.8)	1.1	1.0	1.2
Retinoblastoma	3	4	9	6	22(10.0)	2.7	1.0	0.9
Germ cell tumor	1	1	0	2	4(1.8)	3.1	4.0	0.9
Sarcoma	5	2	3	4	14(6.4)	11.1	2.3	1.2
Miscellaneous	5	3	2	—	10(4.5)	5.0	0.4	0.6
<b>Totals</b>	<b>54</b>	<b>45</b>	<b>65</b>	<b>56</b>	<b>220</b>			

Leukemia and lymphoma accounted for 43.2% of all types of cancer, while malignant tumors of the central and sympathetic nervous system accounted for another 27.3%. Tumors of soft tissue, kidney, bone, liver, and retinoblastomas of the eyes accounted for another 25%. A total of 95.5% of all childhood

tumors occurred in these primary site groups.

Table 2 shows the distribution of each cancer according to patients' sex and three 5-year age groups: 0-4, 5-9 and 10-14 years. The highest percentage of Wilms' tumor, neuroblastoma and retinoblastoma occurred among the 0-4-year-old age group.

**Table 2.** Distribution according to sex and age of childhood malignancy at Chulalongkorn Hospital during 1986-1989.

	Sex		Age (years)		
	M	F	0 - 4	5 - 9	10 - 14
1. Leukemia					
Acute Lymphoblastic Leukemia	43	25	34	18	16
Acute Nonlymphocytic Leukemia	8	5	3	3	7
Chronic Myelogenous Leukemia	2	1	2	0	1
2. Brain and nervous system					
Glioma	2	2	1	3	0
Ependymoma	1	0	0	1	0
Astrocytoma	5	5	2	5	3
Medulloblastoma	11	5	7	3	6
Miscellaneous	7	6	3	3	7
3. Lymphoma					
Hodgkin's	4	0	0	1	3
Non-Hodgkin's	4	3	2	5	0
4. Sympathetic nervous system					
Neuroblastoma	10	6	13	1	2
5. Soft tissue sarcoma					
Fibrosarcoma	1	0	0	1	0
Rhabdomyosarcoma	2	1	2	1	0
6. Kidney					
Wilms' tumor	6	5	10	1	0
7. Bone					
Ewing's sarcoma	1	1	0	0	2
Osteosarcoma	5	1	0	0	6
Unspecified	1	1	1	1	0
8. Retinoblastoma	11	11	21	1	0
9. Germ cell	4	0	3	1	0
10. Liver					
Hepatocarcinoma	0	2	1	1	0
Hepatoblastoma	2	0	2	0	0
11. Miscellaneous					
Thyroid carcinoma					
Papillary	1	0	0	0	1
Follicular	0	2	0	0	2
Malignant thymoma	1	0	0	0	1
Nasopharyngeal carcinoma	0	1	0	0	1
Ethmoid	0	1	0	0	1
Others	2	2	3	0	1
<b>Total</b>	<b>134</b>	<b>86</b>	<b>110</b>	<b>50</b>	<b>60</b>

In this study, the rank order, classified by cell type, of the 10 most common tumors in childhood is: 1. Acute lymphoblastic leukemia (ALL), 2. retinoblastoma, 3. neuroblastoma, 4. medulloblastoma, 5. Acute non lymphocytic leukemia (ANLL), 6. Wilms' tumor, 7. astrocytoma, 8. non-Hodgkin's lymphoma (NHL), 9. osteosarcoma, 10. rhabdomyosarcoma and 11. Hodgkin's disease. The rank order of the seven most common tumors which are classified by organ system is: 1. leukemia, 2. central nervous system tumor, 3. retinoblastoma, 4. lymphoma, 5. Wilms' tumor and 6. bone tumor.

Table 3. shows the distribution according to

residential location by province. There were 79 cases (35.9%) from the metropolitan Bangkok area and 87 cases (39.5%) from the central region of the country. Chon Buri had the highest number of referral cases to Chulalongkorn Hospital, accounting of 21 cases (9.5%).

Table 4 shows the distribution according to institutions, namely Chulalongkorn Hospital (from this study) during the period 1986 to 1989, and Ramathibodi Hospital during the period 1969 to 1982<sup>(3)</sup> in comparison with the incidence in the United States of America during the period 1973 to 1983.<sup>(1,2)</sup>

**Table 3.** Distribution according to residential location, by province of childhood malignancy, at Chulalongkorn Hospital during 1986 – 1988.

[illegible]

Province	AL	AN	CM	LY	WI	NE	BR	LI	RE	GE	SA	MI	Sub total
Bangkok	31	3	3	5	4	2	15	1	4	2	5	4	79
Northeastern Region													
Nakhon Ratchasima	-	-	-	1	-	1	2	-	-	-	1	-	5
Khon Kaen	-	-	-	-	-	-	1	-	1	-	-	-	2
Kalasin	-	-	-	-	1	-	1	1	-	-	1	-	4
Nong Khai	-	-	-	-	-	-	-	-	1	-	-	-	1
Roi Et	1	-	-	-	-	-	1	-	-	-	-	-	2
Buri Ram	2	-	-	-	-	-	1	-	-	-	1	1	5
Si Sa Ket	-	-	-	-	-	-	-	-	-	-	1	-	1
Surin	1	1	-	-	-	1	-	-	1	-	-	-	4
Udon Thani	1	-	-	-	-	-	-	-	-	-	-	-	1
Ubon Ratchathani	-	-	-	-	-	-	-	-	1	-	1	-	2
Mukdahan	-	-	-	-	-	-	-	-	-	-	-	1	1
													28
Southern Region													
Chumphon	-	1	-	1	-	-	1	1	-	-	-	-	4
Ranong	1	-	-	-	-	-	-	-	-	-	-	-	1
Surat Thani	-	-	-	1	1	-	1	-	1	-	-	-	3
Krabi	-	1	-	-	-	-	-	-	-	-	-	-	1
													9
Total	68	13	3	11	11	16	44	4	22	4	14	10	220

AL = Acute Lymphoblastic Leukemia,  
AN = Acute Nonlymphocytic Leukemia,  
CM = Chronic Myelogenous Leukemia,  
LY = Lymphoma,

WI = Wilms' tumor,  
NE = Neuroblastoma,  
BR = Brain tumor,  
LI = Liver tumor,

RE = Retinoblastoma,  
GE = Germ cell tumor,  
SA = Sarcoma,  
MI = Miscellaneous

Table 4. Distribution of childhood malignancy according to institutions and countries.

	Total (%)		
	CU Hosp.	Rama. Hosp. (3)	USA (2)
Leukemia	38.8	31.6	28.3
Lymphoma	5.0	9.7	10.6
Brain tumor	19.9	23.7	19.2
Retinoblastoma	9.7	10.7	2.7
Neuroblastoma	7.4	7.1	7.6
Wilms' tumor	5.0	3.5	6.3
Sarcoma	6.5	4.6	6.8
Liver tumor	1.9	1.1	1.5
Germ cell tumor	2.3	1.4	1.8

Discussion

With industrialization, the contamination of the environment with chemical carcinogens is a well-known phenomenon; one of the consequences is an increase in the cancer rate. This is suspected in Bangkok and its surrounding vicinity, but without solid proof because of the low accuracy of the census, large number of migrant workers, and lack of cooperation

on pooling the data from the cancer centers. By analyzing the data from Chulalongkorn Hospital, a major referral center in Bangkok and in the central region of the country, we found that the majority of cases were from Bangkok itself and from the central region of the country. Chon Buri had a higher than expected number of cases referred (Table 3), which could be due to educational affiliation between Chon

Buri Hospital and Chulalongkorn Hospital, or to other factors such as the large population in that province, or even from environmental damage from petrochemical industries in the province, which is the largest in the country. Further data gathering and analysis of all the cases from the province are needed for making a definite conclusion.

Retinoblastoma cases comprised 10.0% all cancer cases, which is remarkably higher than the 2.7% incidence for the 10-year period 1973 to 1983 in the USA<sup>(1,2)</sup> (Table 4). This number also coincided with the high incidence of retinoblastoma seen from 1969 to 1982 at Ramathibodi Hospital<sup>(3)</sup> which comprised 10.7% of all cases (Table 4). Another interesting finding is the three cases of retinoblastoma in Phetchaburi (Table 3), which is a rather small province. Since the loss or inactivation of the retinoblastoma gene on chromosome 13 predisposes an individual to retinoblastoma, the high incidence of this chromosomal abnormality in the region could be the cause of this phenomenon. Also another interesting finding is the three cases of neuroblastoma in the small province of Lop Buri (Table 3).

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## References

1. Young JL Jr, Ries LG, Silverberg E, Horm JW, Miller RW. Cancer incidence, survival, and mortality for children younger than age 15 years. *Cancer* 1986 Jul 15; 58 (2 Suppl): 598-602
2. Young JL, Miller RW. Incidence of malignant tumors in U.S. children. *J Pediatr* 1975 Feb; 86(2): 254-8
3. ภัทรพร อิศรางกูร ณ อยุธยา, พงษ์จันทร์ หัตถิรัตน์, พิมพ์เขียวศิลป์. โลหิตวิทยาในเด็ก. พิมพ์ครั้งที่ 2. กรุงเทพฯ : โรงพิมพ์ 2532. 340