

## A STUDY ON THE PREVALENCE OF ACUTE LEUKEMIA AMONG A GROUP OF IRAQI PATIENTS

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### Abstract

Many children under 15 years of age and many adults more than 15 years of age with acute leukemia registered and treated in Oncology Department attached to the Al-Yarmuk Teaching Hospital and Child Central Hospital in Baghdad were enrolled in this study, as regards to their general characteristics and the type of acute leukemia. For comparison purposes, one year was chosen (2006), which showed that, the incidence with acute lymphoblast leukemia in children was 72.5%, while the incidence with acute myelocytic leukemia in adults was 27.5%. During the year, 2006, male predominance was evident. The fraction of patients living in urban areas was more than those of rural regions.

The symptoms of leukemia patients were headache, vomiting, anemia, and fever (38-38.5C°) for more than 2 weeks, fever pallor, spleen or liver were moderately enlarged or hepatosplenomegaly; in addition to throat and mouth lesions. Most children and adults also had thrombocytopenia, leucopenia and high rate of erythrocyte sedimentation rate. The frequency and general characteristic of acute leukemia in this study were compared to these reported else where.

### Introduction

The effect of the prohibited weapons used by USA and allied forces on the incidence of childhood malignancies in the north of Iraq were determined. Lymphoma precedes other malignancies, it was (36.4%), while leukemia was (31%) [1]. During the allied forces aggression from July/1999 to July/2000 in Basrah city, a total of 573 patients with malignancies were seen in the Oncology Department, 52.9% female and 47.1% male were more than 15 years of age. During the same period, the main annual incidence of childhood malignancies was 34.5\million children under 15 years of age.

The United Kingdom Atomic Energy Authority (UKAEA) prepared a secret report in April 1991, which the London independent obtained. The report confirmed that the United States ground forces fired between 500 and 5000 pounds of Depleted Uranium (DU) arm our-piercing shells. In addition, U.S. and British aircrafts launched approximately 5000 DU rockets and missiles. The results are tons of radio active and toxic rubble in Kuwait and Iraq [2, 3, 4]. Acute lymphoblastic leukemia

(ALL) is the predominant form of leukemia in childhood and the most common form of cancer in children. Acute leukemia in adults is predominantly myelocytic, though some cases of lymphoblastic leukemia are also seen [2, 3].

The most common tumors in Iraq are those of the breast (14%), lung (10.6%) and bladder (7.5%), followed by cancer of the lymphatic system. Leukemia was the fifth commonest cancer in 1998, responsible for (5.8%) of all tumors[ 5 ].The cancer registry reports an increase in the number and proportion of cases of leukemia in the southern governorates since 1993.It was (6.1%) in male and (5.5%)in female [ 6].

In preceding papers it was shown that the use of depleted uranium by the U.S. troops and their allies during their aggression on Iraq in 1991 has resulted in significant increase in the incidence of malignant diseases (including leukemia's) among children. Thus it decided to carry out a study to test the hypothesis that following the 1991 aggression there has been an increased incidence of malignant diseases among all groups of population.

**Materials and Methods**

The Oncology Department attached to Al-Yarmuk Teaching Hospital and Child Central Hospital in Baghdad is the centers which covers most of Baghdad population. Children and adults with acute leukemia were referred to these hospitals for treatment. From the period January 2006 to end of December 2006.

Many children under 15 years of age with acute leukemia attended the centers were enrolled in this study. The records of the patients were studied in regards to their age, sex and residence.

Acute leukemias have been defined by blood smear and bone marrow examination in addition to white blood cells count; Red blood cells count; platelets count; erythrocyte sedimentation rate; hemoglobin and size of spleen and liver.

**Results**

During the year, 2006, a total of 131 patients (children and adults) with acute leukemia's were seen in the Oncology Department, 95 ant of 131 patients (72.5%) were less than 15 years of age Table (1).

Whereas 36 ant of 131patients (27.5%) of whom were more than 15 years of age Table (2).

There was an increase in the acute lymphoblastic leukemia (ALL) in children, 72.5%, but acute myeloblastic leukemia (AML) in adults was 27.5%, this result was agreed with the observations in the north of Iraq and others [1,3,7].

Male with AML was 61.1% on the top of the leukemia, while female with AML was 38.9%. Boy with ALL was 51.6%, while girl with ALL was 48.4%.This result is compatible to what was observed by others [1] between 1991-1998 leukemia in male was 61.1%, while in female was 38.8% in north of Iraq Table (3).

Acute lymphoblastic leukemia (ALL) represent about 56.8% of all cases with a peak incidence at age  $\leq 5$  year Fig. (1) Acute myelocytic leukemia (AML) account for abut 44.4% of all cases, with a peak incidence at age 25-34 years Fig. (2).

*Table (1)*

*General characteristic of study subjects in children with acute lymphoblastic leukemia.*

Criteria		2006	Percentage
		Total =95	
		No.	%
Gender	Boy	49	51.6
	girl	46	48.4
Age	0-5	54	56.8
	6-10	32	33.7
	11-14	9	9.5

*Table (2)*

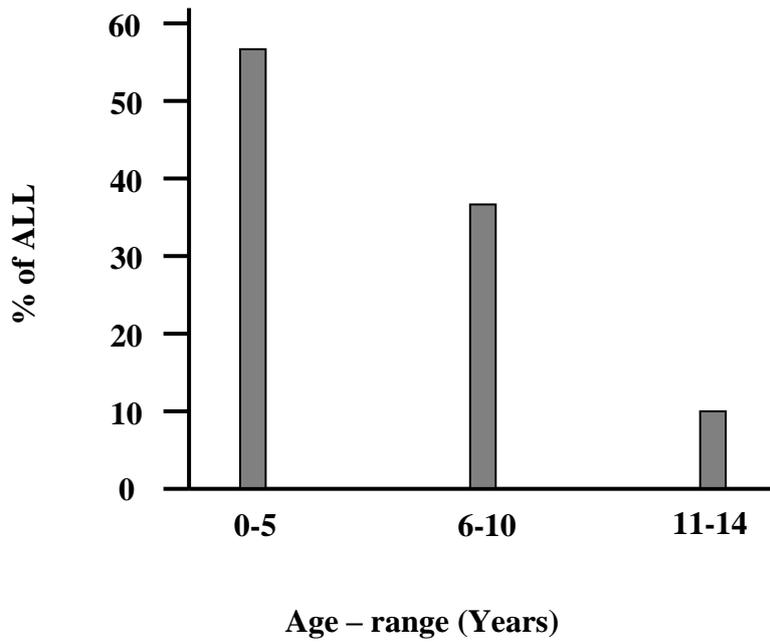
*General characteristics of study subjects in adults with acute meylocytic leukemia.*

Criteria		2000	Percentage
		No. = 36	
		No.	%
Gender	Male	22	61.1
	female	14	38.9
Age range (Years)	15-24	5	13.9
	25-34	16	44.4
	35-44	2	5.6
	45-54	4	11.1
	54-64	9	25

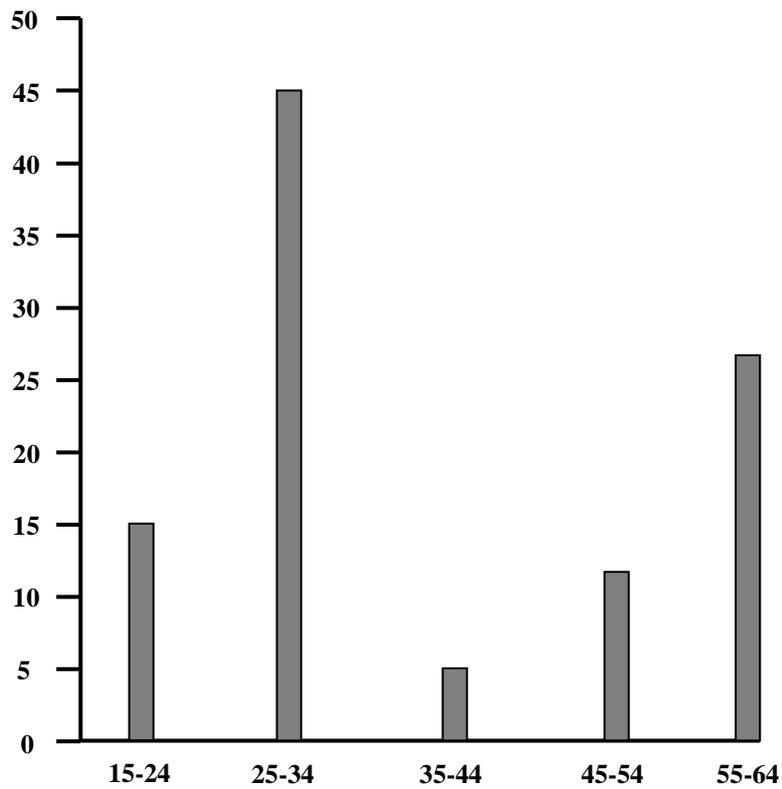
*Table (3)*

*Study population according to type of malignancies and sex after the allied force aggression on Iraq, 1991 [ 1 ].*

Type of malignancy	1991-1998		
	Male	Femal e	Total
Leukemia	63	40	103
Lymphoma	176	74	250



*Fig. (1) : The percentage of ALL in children.*



*Fig. (2) :The percentage of AML in adults.*

Childhood ALL occurred slightly more frequently in boys than in girls. Adults AML occur more frequently in males than in females [Table 1] and Table (2). In acute cases, especially in children, some degree of splenomegaly was frequent; in adults spleen enlargement was not so often found. Slight hepatic was very common; it may be due to congestive changes due to the anemia on the heart or to leukemia infiltration.

Most patients were pale with fever (38-38.5C°) which may be ascribed to a specific cause such as upper respiratory infection and throat or mouth lesions, and it continuous for more than 2 weeks.

The data for erythrocyte sedimentation rate (ESR), white blood cells count (WBC), red blood cells count (RBC), hemoglobin and platelets count were given in the Table (4) and Table (5).

The most important changes were in the white blood cells (W.B.C) and erythrocyte sedimentation rate (E.S.R). Many patients never showed any increase in the total white cell count during the whole course of the disease, indeed a leucopenia was found ; occasionally patients presented with such elevated WBCs as were seen in total WBCs count, and counts of over 67900 cell/mm<sup>3</sup> in adults were unusual. Total WBC count of one child (6 years old) was 2600 cell/mm<sup>3</sup> while other child (11 years old) was 500 cell/mm<sup>3</sup> Table (4) and Table (5). Anemia, except in very early cases, was almost invariably presented when the patient first seek advice; as the disease advanced it became very sever (5 g/dl in adults but 6 g/dl in children). Thrombocytopenia was found, and it became very server indeed as the disease advanced. The erythrocyte sedimentation rate was increased and may be very high (90 mm/hr in children and 130 mm/hr in adults). Table (4) and Table (5).

**Table (4)**  
*Hematological findings of total WBC count, Hb, PCV, ESR and platelets count in adults with AML.*

Age-group (years)	WBC (cell-mm <sup>3</sup> )	Hb (g/dl)	PCV (%)	ESR (mm/hr)	Platelets (cell/mm <sup>3</sup> )
15-24	48000-67900	5-8.5	19-25	12-45	150000-267000
25-34	5600-7800	6.1-9.9	19.2-30	34-40	10000-45000
35-44	740-3920	6-13	16-32	60-130	17000-184000

**Table (5)**  
*Hematological findings of total WBC count, Hb, PCV, ESR and platelets count in children with ALL.*

Age-group (years)	WBC (cell-mm <sup>3</sup> )	Hb (g/dl)	PCV (%)	ESR (mm/hr)	Platelets (cell/mm <sup>3</sup> )
0-5	6000-8200	6.2-9	19-37	30-38	17000-20000
6-10	6300-17000	6-10	19-30	56-90	10000-30000
11-14	44000-80400	8-10	24-30	24-90	10000-55000

## Discussion

In the north of Iraq, about half of the children affected were below 5 years of age before and after aggression ; and 24.2 of them were 11-14 years of age [1]. While in south of Iraq, 45.5% of children affected were below 15 years of age during (1995-1997) [17]. Acute lymphocytic leukemia accounted for 75% of childhood leukemia. Within the first 15 years of life, marked differences are found in the age-distribution of various cancers. There are striking changes in single year in the rates of acute lymphocytic leukemia, neuroblastoma and hepatoblastoma in children younger than 5 years of ages. Gradual increases with age are seen in the incidence of osteosarcoma and lymphomas [7]. AML more frequent in patients > 60 years old than in younger patients [8].

The predominance of urban population is to specialized health services which results in earlier recognition and referral of cases. Moreover, physical and chemical carcinogens are more likely to affect children inside cities than in rural areas. The same results were observed by other [1,9].

AL-Nassir *et al.*, revealed that (87%) of Iraqi children had acute lymphoplastic leukemia (ALL) and (13%) non acute lymphocyte leukemia (NALL). The peak age incidence of ALL was 2-4 years, with (60%) boys and (40%) girls [ 10 ].

The incidences of childhood cancer are ten fold that in industrial countries. In Iraq, leukemia being the most common [ 11 ].

In other study, the Iraqi medical team in the south of Iraq revealed that the percentage of leukemia was (8.6%) in male and they suggested an increasing of leukemia in women next years [ 12 ]. The white cell count may decrease normal or increased up to at least  $500 \times 10^9 / L$ . Thrombocytopenia in most cases, often extremely low in AML [13]. Patients with AML presenting with a low WBC count [8]. Initial laboratory studies were significant for a white blood count of  $440.000 / \mu l$ . Additional laboratory values at presentation included hemoglobin; 11.2 g/dl; hemotacrit, 28%; plates,  $40.000 / ml$  [14,15,16]. Moderate splenomegaly, hepatomegaly especially in ALL, in addition to headache, nausea, fever

( $38.5C^{\circ}$ ) and vomiting were observed in patients. In both children and adults [14].

It was thought that the incidence would continue to rise in the following years and a surveillance system was established to monitor and record all malignancies among children below 15 years of age in Basra [17, 18].

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## الخلاصة

بعض الأطفال دون سن ١٥ سنة وبعض البالغين فوق سن ١٥ سنة يعانون من أبيضاض الدم الحاد والذين سجلوا في قسم الأمراض الخبيثة في مستشفى الطفل المركزي ومستشفى اليرموك التعليمي في بغداد قد تم مقارنتهم في البحث من حيث الصفات العامة ونوع أبيضاض الدم الحاد. لأغراض المقارنة ، تم اختيار سنة ٢٠٠٦ ، ظهر أن ٧٢.٥% من الأطفال المصابين بالليوكيميا هو من نوع أبيضاض الدم اللمفاوي الحاد بينما ظهر ٢٧.٥% من البالغين المصابين بالليوكيميا هو من نوع أبيضاض الدم الحاد ، وظهر رجحان عدد الذكور والذين يقطنون المدن على أقرانهم الذين يسكنون الريف. يعاني معظم المرضى من ألم في الرأس وتقيؤ وفقر دم وتضخم الكبد أو الطحال أو الأثنان معاً ، ومن أهم الأعراض المرضية هو ارتفاع درجة حرارة الجسم (٣٨-٣٨.٥)م° وتستمر لأكثر من ٢ أسبوع دون انخفاض ، وشحوباً واضحاً فضلاً عن تقرحات الفم والبلعوم.

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