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# Study on Acute Leukemia in Iraqi Population

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**Abstract**

Many children under 15 years of age and many adults more then 15 Years of age with acute leukemia registered and treated in Oncology Department attached to the Al-Yarmuk Teaching Hospital, Child Central Hospital and air force 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 (2000), it was showed that the incidence with acute lymphoblastic leukemia in children was 72.5%, while the incidence with acute myelocytic leukemia in adults was 27.5%. During this year, 2000, 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 (38-38.5°C) 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.

**الخلاصة**

بعض الأطفال دون سن 15سنة و بعض البالغين فوق سن 15سنة الذين يعانون من ابيضاض الدم الحاد و الذين سجلوا و عولجوا في قسم الأمراض الخبيثة في مستشفى الأطفال المركزي و مستشفى اليرموك التعليمي و مستشفى القوة الجوية و مستشفى المنصور للأطفال /دائرة مدينة صدام الطبية في بغداد قد سجلوا في البحث من الصفات العامة و ابيضاض الدم الحاد.

لأغراض المقارنة، تم اختيار سنة 2000، ظهر أن 72.5%من الأطفال المصابين باللبوكيميا هو من نوع ابيضاض الدم الليمفاوي الحاد بينما ظهر 27.5% من البالغين المصابين باللبوكيميا هو من نوع ابيضاض الدم الحاد، و ظهر الأعراض المرضية هو ارتفاع درجة حرارة الجسم (38-38.5)م و تستمر لأكثر من 2 أسبوع دون انخفاض، و شحوباً واضحاً فضلاً عن تقرحات الفم و البلعوم.

## 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, (36.4%) after the violence, while leukemia (31%) was the leading malignancy before. (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 age childhood malignancies was 34.5/ million children under 15 years of age (optical health of Basra, 2000). 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) armour-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 from 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. (3, 2).

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 was 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, child Central Hospital, Al-Mansour Child Hospital/ Saddam medical City, Baghdad Hospital/ Saddam Medical city and Air Force Hospital are the centres which covers most of Iraqi population. Children and adults with acute leukemia are referred to these hospitals for treatment. From the period January 2000 to end of December 2000.

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

During the year, 2000, a total of 131 patients (children and adults) with acute leukemia were seen in the Oncology Department, 72.5% (95/131 ×100) were less than 15 years of age table (1).

**Table (1): general characteristic of study subjects in children with acute lymphoblastic leukemia.**

| Criteria | | 2000 n = 95 | Percentage |
|---|---|---|---|
| | | 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 |

Whereas 27.5% (36/131 ×100) of whom were more than 15 years of age table (2).

**Table (2): General characteristics of study subjects in adults with acute meylocytic leukemia.**

| Criteria | | 2000 n = 36 | Percentage |
|---|---|---|---|
| | | 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 |

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 was compatible with the observations in the north of Iraq. (1), and others (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).

**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 | Female | Total |
| Leukemia | 63 | 40 | 103 |
| Lymphoma | 176 | 74 | 250 |

Acute lymphoblastic leukemia (ALL) represent about 56.8% of all cases with a peak incidence at age <= 5 year. Fig (1).

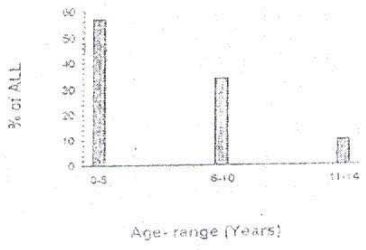


Fig. (1): The percentage of ALL in children.

Acute myelocytic leukemia (AML) accounts for about 44.4% of all cases, with peak incidence at age 25-34 years. Fig (2).

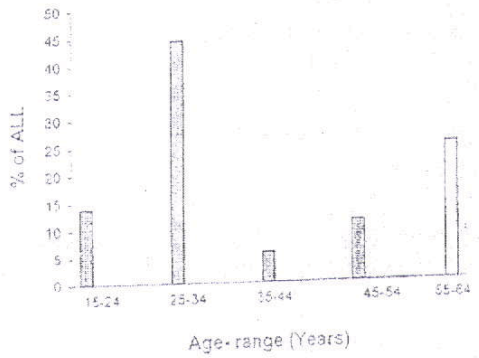


Fig. (2) The percentage of AML in adults.

In 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). Where as in south of Iraq, 45.5% of children affected were below 15 years of age during (1995-1997) (5,6). Acute lymphocytic leukemia account for 75% of childhood leukemia (7). Within the first 15 years of life, marked differences are found in the age-distribution of various cancers. There are striking changes in a 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 asteosarcoma and lymphomas.

AML more frequent in-patients > 60 years old than in younger patients (5, 6, 7, 8).

The predominance of urban population is likely 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, 5, 8).

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 splenic enlargement was not so often found. Slight hepatic enlargement was very common; it may be due to congestive changes due to effect of anemia on the heart or to leukemia infiltration.

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

Moderate splenomegaly, hepatomegaly especially in ALL, in addition to headache, nausea, fever (38.5°C) and vomiting were observed in-patients. In both children and adults. (9, 10).

The data for erythrocyte 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).

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

| Age-group (years) | WBC Cell/mm³) | Hb (g/dl) | PCV (%) | ESR (mm/hr) | Platelets (cell/mm³) |
|---|---|---|---|---|---|
| 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-ground (years) | WBC (cell/mm³) | Hb. (g/dl) | PCV (%) | ESR (mm/hr) | Platelets (cell/mm³) |
|---|---|---|---|---|---|
| 0-5 | 6000-820 | 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 |

The most important changes were in the white blood cells (W.b.C) and erythrocyte sedimentation rate (E.S.R); although the total count may not be very abnormal the differential count in both children and adults. 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, a counts of over 67900 cell/mm³ in adults were unusual. Total WBC count of one child (6 years old) was 2600 cell/mm³ while other child (11 years old) was 500 cell/mm³.

Anemia, except in very early cases, was almost invariably presented when the patient first seek advice; as the disease advanced it became very severs (5 g/dL in adults but 6 g/dL in children). Thrombocytopena was found, and it became very sever indeed as the disease advanced. The erythrocyte sedimentation rate was increased and may be very high (90mm/hr in children and 130mm/hr in adults). Table (4) and table (5). The white cell count may decrease, normal or increased up to at least 500x $10^9$/L.

Thombocytopenia in most cases, often extremely low in AML. (11). Patients with AML presenting with a low WBC count (6). Initial laboratory values at presentation included hemoglobin, 11.2 g/dt; hemotacrit, 28%, platets, 40,000/ul. (10).

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 Basrah (13; 11).

A continued research is needed to clarify relation between radiation exposures of prohibited weapons used by USA and Cancer risk. Because this very important for cancer control and how to use drugs against the cancer.

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