

The prevalence and pattern of leukemia among children in Mosul, Iraq

Thalfaa Nathim Alkhayatt¹, Zainab Assam Ali², Abudladheem Hakima Younis³

F.I.B.M.S Pediatrics, Ibn Al-atheer Teaching Hospital, Iraq¹
F.I.C.path (Haematology), Ibn Al-atheer Teaching Hospital, Iraq²
CABP, Ibn Al-atheer Teaching Hospital, Iraq³



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ABSTRACT

This study aimed to investigate the risk and trend of children leukemia in Mosul, Iraq, over the year 2020. Between January and December 2020, research was undertaken on the hospital registry. The study included all children with leukemia aged one to fourteen years at the Nuclear Medicine Hospital in city of Mosul, Iraq. All confirmed childhood leukemia data were obtained and analyzed. The individual incidence rates were computed. From January to December 2020, there were 66 instances of pediatric leukemia. During this time period, the total age-standardized incidence rate (ASIR) was 5.45/100000. During this 5-year period, no temporal rise in children leukemia incidence rates was detected. Acute lymphoblastic leukemia (ALL) was the most prevalent kind of leukemia in this research, followed by acute myeloid leukemia (AML) and chronic myeloid leukemia (CML). Males had a higher prevalence of all leukemia subtypes. The greatest rates of ALL and CML were found in children aged 2 to 5 years. AML was more frequent between the ages of 6 and 14 years. In Mosul, leukemia was the most frequent pediatric cancer. Although there was no temporal rise in pediatric leukemia incidence rates during 2020, the incidence of leukemia in children in Mosul was greater when compared to other nations. Epidemiological research is required to understand the cause of pediatric leukemia in Mosul.



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1. INTRODUCTION

Official statistics announced by government agencies and other non-governmental activists concerned with blood diseases in Iraq confirmed the high rates of people with blood diseases significantly in the past few years, especially among children under the age of eighteen, for various reasons [1]. Leukemia, or leukemia, is a malignant disease of blood cells that originates in the bone marrow [2], [3]. Leukemia deals with the development of a malignant blood cell without proper control or maturation, and its control over the spinal cord and affecting its normal activity [4], [5]. In healthy bone marrow, three types of cells are produced: red blood cells that carry oxygen to tissues, white blood cells that defend the body against the attack of germs and viruses, and platelets that contribute to blood clotting and stopping bleeding [6]. A malignant blood cell (blast cell) in the bloodstream can reach the lymph nodes, liver, spleen, central nervous system, testicles and other organs [7], [8]. One of the recent studies on the causes of the increase in cancers after 2003 confirmed

that the rates of cancer among children in Iraq rose to 22 cases per 100,000 children compared to 1990, when the incidence was four children per 100,000 children.

2. Methods

Study design: A cross-sectional study was applied in city of Mosul during 2020.

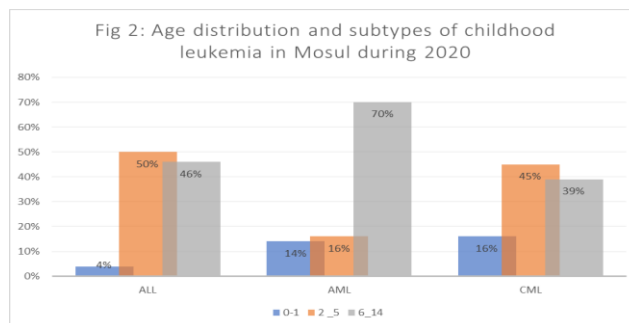
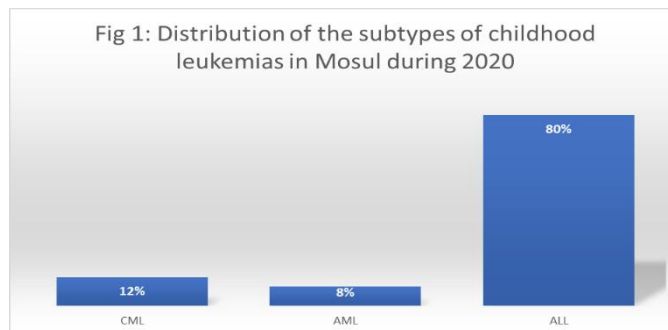
Study sample: A medical records of Mosul Nuclear hospital were reviewed during 2020.

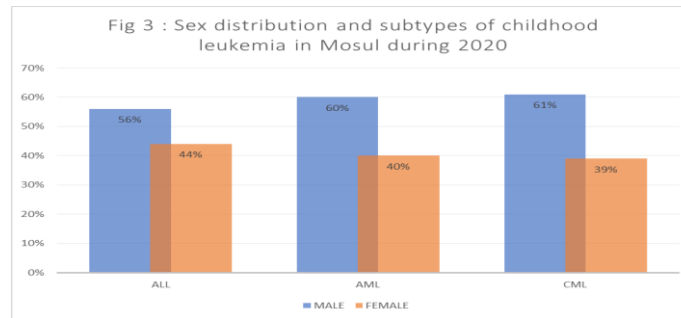
Study tools: information sheet was created by the authors that included (age, gender, types and subtypes of Leukemia, types of management and duration of disease.

Data analysis: Data were coded and entered in IBM Computer, then the results were presented as figures using Microsoft excel version 2019.

3. Results

Figure 1 shows the subtypes of leukemia seen in the City of Mosul, Iraq. In this study, ALL was the most prevalent kind of leukemia, followed by AML and CML. Figure 2 shows the age distribution according to leukemia subtype. The greatest rates of ALL and CML were found in children aged 2 to 5 years. AML was more prevalent in children aged “6 to 14” years. figure 3 depicts the gender distribution and subtypes of leukemia. Males were shown to have a higher prevalence of all subtypes of leukemia in the current investigation.





4. Discussion

This study provides information on the incidence of pediatric leukemia in Mosul, temporal trends, and regional differences. Leukemia accounts for about 47 percent of pediatric cancers in Mosul, this rate is high in comparison with other country like United States 20 percent, 30 percent in France [9], 33 percent in Germany [10] and 35 percent in China [11] and India [12]. This result can be explained as due to exposure to various environmental risk factors during the last wars. The leukemia rate in children under 15 years of age is estimated at 4 per 100,000 per year in the developed world and 2.5 per 100,000 per year in the developing world [9- 11]. With regard to age, the relative distribution of leukemia showed a significant correlation in children at the age of two and six years. Although there is no clear explanation for this association, it may be due to factors related to lifestyle. This was similar to the United States and the United Kingdom, where the incidence is higher between 2 and 5 years and may be lower. The peak is less pronounced in less developed countries [9], [10]. The Nineveh Health Department reported that the incidence of cancer has increased dramatically, especially during the years following the war against ISIS, amid warnings of possible genetic mutations in newborns that may lead to an increase in congenital anomalies and birth disabilities. The Director-General of Nineveh Health, Falah Al-Tai, said, "The Oncology and Nuclear Medicine Hospital in the province records annually between (2,500/2000) cases of cancer, most of which are women diagnosed with breast cancer, which is the most common type currently in Nineveh." Al-Taie added that "the number of injuries increased significantly after the liberation of the city of Mosul from the terrorist gangs of ISIS, as the health of Nineveh recorded in the years (2017/2018) a significant increase in injuries," noting that "the Ministry of Health provided all the doses and antibiotics for the disease."

As for the specialist doctor Nizar Al-Araji from the Children's Cancer Hospital in Mosul, he believes that "the causes of this disease have been multiplied by the war and its horrors, especially among children under 12 years of age, as radioactive weapons were used during the battles with the ability to penetrate fortifications and burn those inside, and the great pollution caused by a machine The war, as well as the emission of gases from thousands of decomposing bodies, some of which are still under the rubble of buildings, in addition to the sounds of explosions and fear sometimes responsible for stimulating cancer cells, as well as known causes such as smoking, pollution and genetic predisposition. While Dr. Jumana Jamal Al-Badrani, a specialist in chemotherapy, said: "Weapons designed to penetrate thick buildings and walls may be responsible for stimulating cancer cells and accelerating their activity and spread." Al-Badrany warned of "possible genetic mutations for newborns and the possibility of an increase in congenital malformations and birth disabilities, as it was noted that the number of brain tumors in men and breast cancer in women increased. "It is worth noting that the Nineveh Health Department had previously opened three hospitals to treat cancer patients after the province was liberated from the grip of ISIS, distributed between the left and right sides [9]. There were also reports that in 2003, oil wells were deliberately set on fire. The main types of pollutants include volatile hydrocarbons, hydrogen sulfide, and natural radioactivity. Even low levels of exposure can be very dangerous because aromatic hydrocarbons (such as benzene), which are considered chemicals, are the most volatile of the hydrocarbons. Studying the leukemic nature of war Timing is challenging given the turbulent state of the

war. The Mosul area is known to suffer from environmental abuse such as auto-depleted uranium [10] and persistent, undifferentiated air and water pollution such as carcinogenic benzene, but our study lacks dosing data for these effects in leukemic patients. This study also analyzed the incidence patterns of leukemia subtypes, with ALL being the most common type of leukemia. This distribution was similar to that of other countries [11], [12]. “In our study, the ratio of boys to girls with leukemia was 124:100, which is close to the sex distribution in North America, including the United States, where the ratio is 120:100. It has also been noted that in many poor countries, the number of cases of The incidence of childhood cancer reported in boys, is significantly higher than in girls. The ratio of boys with childhood cancer to girls increased with lower GDP and higher child mortality, indicating that boys are more likely to suffer from increasing economic disadvantage than girls. In this study, children were more likely to develop leukemia in northern Mosul, an area of poor socioeconomic status compared to downtown Mosul. Previous studies [13- 15] showed a geographic relationship between socioeconomic status and the incidence of childhood leukemia. These studies have shown that the peak incidence of this characteristic occurs during the period of socio-economic development [16], but there is at least one exception [17]. These observations are consistent with the hypothesis that the risk of childhood acute lymphoblastic leukemia can be altered by external factors” [18].

5. Conclusion

The apparent increase in the incidence of leukemia among children cannot be easily explained, which calls for broader environmental and epidemiological studies to identify the main reasons for this increase.

6. References

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