

Reality of Pediatric Cancer in Iraq

Salma Abbass Al-Hadad, MD,* Mazin Faisal Al-Jadiry, MD,* Amir Fadhil Al-Darraji, MD,†
Raghad Majid Al-Saeed, MD,† Safaa Faraj Al-Badr,† and Hasanein Habeeb Ghali*

Summary: This brief report displays comprehensive details of health services provided by Children's Welfare Teaching Hospital, medical city, Baghdad. In 2010; 366 children with newly diagnosed cancer were admitted for treatment, two thirds were leukemia and lymphoma cases followed by other solid tumors except brain tumors. With this large number of patients; there are shortcomings in provision of health services in many aspects including professional manpower, infrastructure, diagnostic and therapeutic facilities, supportive and palliative care. The previous wars and sanction and the current instability of the country added to the socioeconomic difficulties of the families jeopardizing the appropriate therapy and ultimately the poor treatment outcome. Since 2003 an international collaboration had a major contribution in many aspects like provision of drugs and medical supplies, attendance of scientific workshops, and updating doctor's knowledge and experience through telemedicine programs which resulted in decreasing the induction mortality in acute lymphoblastic leukemia from 24% in the year 2007% to 10% in 2010 after introduction of pre-phase steroids and in acute promyelocytic leukemia from 95% to 5% after introduction of all trans-retinoic acid. A collaborative work with Rome University resulted in changing diagnosis of 20% of pathological samples sent there for reevaluation. Iraqi pediatric oncologists still need real attempts to improve infrastructure and human resources in addition to twinning programs with internationally recognized cancer centers to face these management challenges.

Key Words: pediatric cancer, Iraq, treatment outcomes

(*J Pediatr Hematol Oncol* 2011;33:S154–S156)

In the last 3 decades, the health status of the Iraqi people has suffered serious setbacks. The unfortunate circumstances of wars and economic sanctions have damaged many aspects of life in Iraq, with adverse effects on physical health, nutritional status, and psychological well-being, in addition to the rising incidence of communicable and noncommunicable diseases, including cancer—this after a substantial progress been made in improving survival rates for children with both acute and chronic diseases.

The challenge of delivering effective healthcare has been made more difficult by limited investment in clinical facilities and the severe damage done to existing facilities in recent times.

Children's cancer accounts for a higher percentage of cancer in developing countries than in high-income countries owing to the greater proportion of children in poorer nations. Iraq is no exception in this regard.

From the *Oncology Unit, Department of Pediatrics, Children Welfare Teaching Hospital, Baghdad College of Medicine; and †Oncology Unit, Children Welfare Teaching Hospital, Medical City, Baghdad, Iraq.

The authors declare no conflict of interest.

Reprints: Salma Abbas Al-Hadad, MD, Oncology Unit, Department of Pediatrics, Children Welfare Teaching Hospital, Baghdad College of Medicine (e-mail: cancer@mecc-research.com).

Copyright © 2011 by Lippincott Williams & Wilkins

Unfortunately, given the complexities of diagnosis and treatment, children with cancer have greater needs, which often cannot be met.

In this report, the situation at the Children's Welfare Teaching Hospital (CWTH), part of a medical city complex in Baghdad, and in particular, the situation with childhood cancer, will be described to illustrate the problems faced.

CWTH is a tertiary care center established in 1984; maintenance was last carried out in 1989. The hospital is recognized by the Iraqi Board for Medical Specialization for the training of postgraduate students for the National Board in Pediatrics. The clinical facilities of this 240-bed hospital include general pediatric wards; in addition, the pediatric oncology ward was established in 1984; today it includes 5 medical oncologists, 5 fellows, 4 registrars, 2 hemato-pathologists, 4 interns alternating every 3 months and 20 nursing staff (vs. 5 before 2003).

The hospital has hemato-oncology outpatient department and chemotherapy day care, but no bone marrow transplant unit. The infrastructure is damaged at the level of the most basic facilities. Electricity, sewage, water, and communications systems, though improving, remain below the standard required for safe and effective healthcare.

The support services, including the clinical chemistry laboratory, blood transfusion, radiology, and pharmacy departments, are operating below capacity and to questionable safety standards, with a continued lack of maintenance.

There is a real need for more and better-trained nurses generally and in particular specialist nurses to care for children with cancer. The supplies of drugs, medical supplies, and equipment needed to treat children with acute and chronic diseases, although improved, remain in short supply.

The hospital has no radiotherapy department. Although there is a national radiotherapy institute that provides services for the entire country, this facility has a long waiting list (which can be as long as 6 months or even more). Chemotherapy is administered by resident doctors and 3 college nurses owing to lack of dedicated oncology nurses. The unit was not equipped to insert and maintain indwelling intravenous catheters.

The paucity of diagnostic capability, both quantitative and qualitative, imposes major limitations on diagnostic accuracy and jeopardizes appropriate therapy. In addition, there are no social workers or cancer support groups. Infection is the most frequent cause of morbidity and mortality because of the children's poor nutritional status, lack of an infection control policy, and the high rate of parent illiteracy.

The unit had 366 new childhood cancer cases less than 14 years of age in 2010, excluding brain tumors, with a monthly average of 850 patients seen in the outpatient department and approximately 70 inpatients treated each day. Leukemia is the most common neoplasm, followed by lymphoma (Fig. 1).

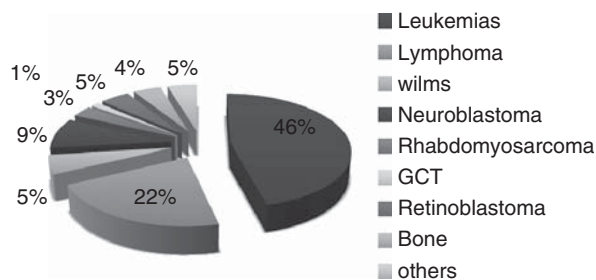


FIGURE 1. Types of cancers referred to pediatric oncology ward (excluding brain tumors).

TREATMENT OUTCOME

The treatment outcome of different types of cancer in our unit has been affected by many factors as the oncologists/hematologists face many obstacles beside the medical problems like the burden of malnutrition, low social and cultural level, distance from the referral hospital, political instability, or wars creating travel difficulties, having an adverse impact on the compliance and inevitably on the outcome of treatment.

The majority of patients who discontinued treatment lived far away from Baghdad; poverty before 2003 and the unstable situation in Iraq after 2003 prevented them from continuing treatment. Some parents believed that their children were cured after 1 to 2 courses of chemotherapy, especially if a good response was achieved.

ACUTE LYMPHOBLASTIC LEUKEMIA

The estimated event-free survival for patients with acute lymphoblastic leukemia (ALL) was low compared with the international standard rate; however, abandonment of treatment was one of the important factors against improving the survival rate, which was ranged between 36.4% and 50.6% compared with 47% to 65% for the optimistic view (when the abandonment regarded as censored at time of last follow-up) (Table 1).

ACUTE PROMYELOCYTIC LEUKEMIA; SEPTEMBER 2003 TO SEPTEMBER 2009

There has been a dramatic change in the induction mortality from 95% to 5% after the introduction of all-trans retinoic acid in the induction phase in a specific acute promyelocytic leukemia (APL) protocol designed by AMT through the telemedicine program,¹ still the overall survival is below the standard owing to high percentage of relapses during the subsequent therapies (A study done on 48 children with APL over a 6-year period showed an event-free survival [EFS] of 42.9% at 48 mo).

NON-PROMYELOCYTIC AML; 2000 TO 2007; EFS OF 109 PATIENTS

On the contrary, the results of non-promyelocytic leukemia's in our setting (EFS 5% to 7%) are far beyond the results of well-recognized cancer centers.

B-CELL NON-HODGKIN LYMPHOMA; 2000 TO 2005; 239 PATIENTS

At 24 months, the overall survival rate of the entire patient population was 66% (95% CI: 62.2-70.6) and the event-free survival rate 53.3% (95% CI: 50.0-56.8).²

HODGKIN LYMPHOMA; 2005 TO 2009; 67 PATIENTS

Although the treatment protocol is short and based on outpatient visits, still we have 5% abandonment of treatment with 3-year EFS of 70%.

WILMS TUMOR IN RELATION TO NEPHRECTOMY; 2005 TO 2009; 90 PATIENTS

Poor surgical facilities added to the burden of management in patients with Wilms tumor, which magnified the proportion of unresectable tumors to 22% in addition to misconception of the cure by some surgeons or the families post-nephrectomy avoiding the need for chemotherapy that resulted in recurrence of the tumor after nephrectomy in 20%. All these problems resulted in an overall survival of 51.1%.

RETINOBLASTOMA OUTCOME DATA: 1999 TO 2006; 32 PATIENTS

Absence of center for focal treatment and multi-disciplinary care team resulted in poor results (disease-free survival 23%, mortality 27%, progressive disease 27%, loss to follow-up 23%).

BONE TUMORS OUTCOME DATA: 1999 TO 2009; 41 PATIENTS BELOW 14 YEARS OF AGE

No facilities for salvage therapy and refusal of amputation by families owing to cultural reasons in addition to lack of drug serum levels precluding the use of high-dose chemotherapy like methotrexate resulted in lower rates of survival. Ewing 29 (70.7%), Osteogenic Sarcoma 12 (29.3%) OS: 56%, Died: 24.3%, LFU: 18.9%.

There is no palliative care program in any hospital in Iraq. With morphine being unavailable, and less-effective analgesics being available only in small quantities, most of the children with cancer die with do not resuscitate order, which is decided by doctors and accepted by the family. Most of the patients die in the hospital.

Currently the unit is implementing western protocols modified to make them feasible in the context of the local situation. The unit provides care to patients from various

TABLE 1. Event Free Survival in Pediatric ALL

Study Period	No.	Duration of Observation	Optimistic Rate	Pessimistic Rate	Abandonment %
2000-2002	239	5-year EFS	47	36.4	22.6
2003-2005	265	3-year EFS	57	40	29.8
2006	99	3-year EFS	65	50.6	24.4

parts of the country excluding Basra and Kurdistan after 2003. It is the main center for childhood cancer in Baghdad.

There is a lack of functional data management system, so the data regarding cancer rates in Iraq are somewhat sketchy, although Iraq established a population-based cancer registry in 1976. The cancer unit registry is kept manually by the pediatric oncologists running the unit. The doctors have a limited access to full-text articles. Internet access is very slow and irregular.

There is always a significant delay between the disease manifestation and referral to us because of delays in diagnosis, or the problems of transportation faced by families who live in distant provinces. A relatively high fraction of patients are lost to follow-up because of economic and security problems, financial and psychological exhaustion as they cannot afford the prolonged treatment cost (transportation, long hospital stay, and loss of daily wages). Families abandon therapy because they mistake remission for cure owing to lack of insight in the necessity to complete 2 to 3 years of treatment, in addition to the fact that there is no structural complete parental education by physicians causing difficulties in assessment of long-term survival in patients who have completed treatment. Follow-up system (to detect drop-out cases and contact their families) is nonexistent.

Blood products are still a difficult challenge, under funding (for example, shortage of bags, kits for screening, and kits for cell separator) with high incidence of hepatitis B infection (27.3%) subsequent to treatment for pediatric cancer. Surgical and radiation oncology are underestimated, and the doctors have inadequate structural training in pediatric hematology/oncology.

The allied health professions, for example, social workers, clinical pharmacists, dieticians, psychologists, and physiotherapists are underrepresented in the clinical team. Bereavement counseling, long-term follow-up, and assessment of quality of life are difficult. Since 2003, care of children with cancer has been supported by a number of organizations, including INCTR and IMC.

Japan-Iraq Medical Network (JIM-NET) is coordinating a program, which provides chemotherapy medicines, infection control materials, teaching microscopes, infusion pumps, centrifuges as well as scientific support to evaluate the progress in reduction of induction mortality. Recent attempts to evaluate the genetic background of Iraqi acute leukemia cases by sending BMA dried samples in special filter papers through DHL.

The support of nongovernmental organizations to participate in regional and international workshops and conferences, with exposure to internationally accepted current practices, has encouraged Iraqi pediatric oncologists to implement improved patient management practices in their daily work. It has also provided them with access to expert consultants when they have difficulties in management, enhancing their links with international institutions and encouraging a multidisciplinary approach to the management of childhood cancer. The value of this

support was reflected in a decrease in induction mortality rate from 24% in the year 2007 to 10% in 2009.³

The collaboration with the hematology unit of Sapienza University in Rome, supported by an Italian nongovernmental organization known as INTERSOS, has been a rewarding experience. One specific outcome has been the design of a modern treatment protocol for the management of Iraqi children with acute promyelocytic leukemia. The treatment protocol for this leukemia, which has a relatively high incidence and mortality in Iraq, includes the use of a retinoid drug (all-trans retinoic acid) provided by INTERSOS; professional consultation is provided via televideo linkage.

Telemedicine program since 2006 provides:

- Scientific support through discussing average of 10 cases/month
- Designing special protocol for APL adapted to our difficulties, modification of T-ALL and Non-Hodgkin's lymphoma treatment strategy
- Analysis of 10 pathological specimens/month since 2008, which resulted in 20% change in diagnosis⁴
- Data analysis and publication-APL, Non-Hodgkin's lymphoma, ALL cases.

Iraqi pediatric oncologist's requirements for improving patient care include improved infrastructure and human resources and more equipment and medicines, which should be made available through a government drug delivery system.

Formation of cooperative groups, which can add the value of building knowledge and experience, also exchange personnel with a focus on training with needs to extend opportunities to data managers, clinical pharmacists, and other members of multidisciplinary pediatric oncology healthcare team, sharing experience and resources through successful "twinning programs."

They need to further develop their research collaboration with other cancer centers through telemedicine programs to catch up with modern care and preferred treatment protocols after a long period of isolation from the outside world and, consequently, an inability to keep up with and implement medical advances.

REFERENCES

1. Testi AM, Al-Hadad SA, Al-Jadiry MF, et al. Impact of international collaboration on the prognosis of childhood acute promyelocytic leukemia in Iraq. *Haematologica*. 2006;91:509-512.
2. Moleti ML, Al-Hadad SA, Al-Jadiry MF, et al. Treatment of children with B-cell non-Hodgkin lymphoma in a low-income country. *Pediatr Blood Cancer*. 2011;56:560-567.
3. Testi AM, Foa R, Al-Jadiry MF, et al. Incidence and predictors of early treatment-related mortality in pediatric acute lymphoblastic leukemia in Baghdad (Iraq). Poster session presented at: Acute Lymphoblastic Leukemia - Therapy, excluding Transplantation: Poster I, 2132. Fifty second American Society of Hematology (ASH) annual meeting; Orlando: Florida, 2010.
4. Uccini S, Testi AM, Al-Badri SF, et al. Gastric perforation as a primary manifestation of lymphomatoid granulomatosis. *Pediatr Blood Cancer*. 2011;57:178-179.