

## Pediatric hematology oncology in Lebanon: A historical perspective

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Lebanon is a small country located in the Eastern Mediterranean; the current population is estimated at around 4 million inhabitants 25% of who are under 18 years of age. The county has been the scene of much turmoil over the past few years. Despite all odds Lebanon has a well developed system of medical education and care, including one of the oldest existing pediatric hematology-oncology programs in the Middle East. The program started at the American University of Beirut Medical Center (AUBMC).

Dr. Salim Firzli was trained in pediatric hematology in Michigan under Wolf Zulzer. In 1957 he returned to Lebanon as a member of the department of pediatrics at the AUBMC and established the first division of pediatric hematology in the country and perhaps the Middle East. Among his achievements was the diagnosis of the first case of sickle cell disease in Lebanon by hemoglobin electrophoresis, using equipment he had set up. Dr. Firzli also established the use of laboratory tests for the diagnosis of hemophilia and the oversaw the institution of care for patients with malignancies.

Dr. Ibrahim Dabbous joined the faculty of the department of pediatrics in 1966 after training at the University of Washington, Seattle and Northwestern in Chicago.

At that time protocol based care for children with malignancies was started and a comprehensive service for children with hematologic disorders was developed. A large number of children with thalassemia were followed at AUBMC as well children with sickle cell disease and other hematologic disorders. During the late sixties and early seventies the demographic features of sickle cell disease were described (1) and a program of chronic transfusion and chelation with desferrioxamine for patients with thalassemia was developed. Eventually cutting edge research led to the identification of the mutations responsible for thalassemia in Lebanon (2,3).

Concomitant developments in this period, which preceded the Lebanese Civil War were the establishment of bone marrow transplantation for immunologic deficiencies in and the establishment of a radiation oncology department at AUBMC.

At the same time Dr. Farid Khouri established a state of the art diagnostic service at AUBMC which include cytogenetics and immune phenotyping of leukemias and lymphomas (4,5). The work of the division and

services continued to develop up till the time of the civil war. During the war the division provided care to a large number of children with blood diseases and cancer with good outcomes despite the obvious difficulties and very limited resources. It is important to note a hematology oncology service was also started at Hotel Dieu de France (HDF), the other teaching hospital in Lebanon at time, then under the leadership of Dr Najib Taleb. While not exclusive to children, the service at HDF provided care to large number of children and adolescents with pediatric malignancies and blood disorders (6)

The Lebanese civil war lasted 15 years during which services were maintained both at AUBMC and HDF due to the efforts of committed professional. Retrospective analysis of the treatment of pediatric ALL in Lebanese children covering this period showed very good results, which are all more impressive considering the difficulties encountered by investigators at that time (7). The war ended in 1991 and the post war period of reconstruction witnessed a flowering in the academic and medical sectors and a substantial improvement in the care of children with malignancies and blood disorders. The number of pediatric hematologist-oncologists increased to a total of 15 most of who were trained in US or France. They are now organized in the Lebanese Pediatric Hematology Oncology Club under the aegis of the Lebanese Pediatric Society.

During this period a number of specialized centers were started. The first of these was the Chronic Care Center which provides diagnostic services and comprehensive care to children with thalassemia in collaboration with governmental funding agencies and through private fund raising. The CCC developed an extensive transfusion and chelation service that serves over 500 children and adults with thalassemia. This center has become a focus of active research in thalassemia and was active in enacting a law of premarital screening that has been responsible for significant decrease in the number new cases of thalassemia born in the country (8).

In 2002 the Children's Cancer Center of Lebanon (CCCL) was established as an affiliate of St Jude Children's Research Hospital (SJCRH) at the AUBMC. The center has over the past 5 years provided care to 470 newly diagnosed cases of cancer in children and provided consultation services to over 1000 patients Lebanon and the region. In collaboration with the International Outreach Program at St. Jude the Center developed protocols, trained professionals and

established a state of the art diagnostic laboratory. This facility currently provides flow cytometry and molecular testing to any patient diagnosed in Lebanon with all expenses paid by the CCCL Foundation. The center also established a limb salvage program, a pediatric stem cell transplant service and a comprehensive sickle cell program. Furthermore a 3 year a fellowship and a nurse training program were established. It is the aim of these programs to train specialist for, Lebanon and countries in the region.

Through collaboration with the Lebanese Ministry of Health and independent fund raising and support from SJCRH the center is able to provide services to all patients regardless of their ability to pay. In addition to this the Center provides patients treated at other centers with medications, diagnostic tests and procedures such limb salvage. Currently 7 hospitals in Lebanon have active pediatric hematology oncology services and two centers provide stem cell transplantation to children. Thus, at this time all children diagnosed with cancer and hemoglobinopathies in Lebanon have access to advanced diagnostic and treatment facilities

The development of research has followed that of the clinical services. Lebanese investigators have been very active as evidenced by the increasing number of publications in the various areas of pediatric hematology-oncology. The next steps should be development of a cohesive and active collaborative group for clinical research and the establishment of a core of basic researchers interested in problems of pediatric hematology and oncology.

Despite the above achievements significant problems remain in the several areas. The most pressing problem at this time is funding. Efforts by private fundraising and the Lebanese Ministry of Health have led to improved coverage for children with cancer and

hemoglobinopathies. Funding for advanced procedures such as allogeneic stem cell transplants is still problematic. In another domain funding for hemophilia care is also still less than desired. In these two areas two international agreements were reached, the first to provide help with SCT in hemoglobinopathies, with Mediterranean Institute of Hematology in Italy, and the second for twining between the Lebanese Hemophilia Society with the University of Geneva. Nonetheless support is still needed to improve care for patients with hemophilia and to provide SCT for children in whom this is a potentially curative option. The problem of funding will be exacerbated if the current political crises in the country persist. It is hoped that currently active public-private partnerships will weather the storm with the support of the private donors, the Lebanese Ministry of Health and international partners.

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