Pediatric Oncology in Developing Countries: Challenges and Solutions

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In developed countries, pediatric cancers are one of the leading causes of death in children. As the under-5-year mortality rate in developing countries drops because of improved sanitation, immunization, and access to basic medical care, pediatric cancers become increasingly important, rising to a position of the third or fourth most common cause of childhood death.1 It is estimated that 80%-85% of pediatric cancer cases occur in the developing world, where the 5-year survival can be less than 10% (in contrast to the US and western European countries, where it is approximately 70%).2 Individual physicians and institutions have developed several programs that model how pediatric cancers can be effectively treated in a resource-poor setting. International partnerships involving twinning, the development of supportive services, and telecare have all proven to be effective in improving pediatric cancer outcomes in developing countries.

Building the Foundation: Twinning

“Twinning,” the pairing of a pediatric oncology unit in a developed country with a hospital in a developing country, has proven to be an extremely effective way to build pediatric oncology programs in developing countries. Many programs initially focus on acute lymphoblastic leukemia (ALL) because it is the most common pediatric malignancy and is largely curable, making outcomes a good indicator of the functionality of fledgling pediatric cancer programs.3,4 Dozens of twinning programs now exist between pediatric oncology departments in the US, Canada, or Western Europe, and hospitals in developing countries. The partnership between St Jude Children’s Research Hospital and a hospital in Recife, Brazil, is one of the best established. Over the 15-year history of this partnership, a dedicated pediatric oncology unit in Recife has been established and the 5-year event-free survival among pediatric patients with ALL in Recife has improved from 32% to 63%.5 The multifaceted nature of this twinning program has been key. For example, establishing a reliable supply of blood products and training nursing staff has helped to reduce treatment-related mortality while implementing a standardized region-specific protocol that is feasible to use in Recife, ensuring the availability of chemotherapy drugs, and providing doctors with specialized training in pediatric oncology has decreased the relapse rate.6,7 The hospital in Recife now treats many other pediatric malignancies besides ALL and has become a leader in the recently established Central American Association of Pediatric Hematology Oncology.8

The International Network for Cancer Treatment and Prevention, a non-governmental organization dedicated to improving oncology care in the developing world, supports a variety of individual programs by contributing knowledge and experience acquired from other programs involved with International Network for Cancer Treatment and Prevention.9 One such supported program is the recently established twinning partnership between Georgetown University Hospital and Tikur Anbessa Hospital in Addis Ababa, Ethiopia. The objectives of this twinning program include providing Ethiopian physicians with specialized pediatric oncology training and developing a curriculum for a fellowship program in pediatric oncology and palliative care, critical first steps in a country with zero trained pediatric oncologists.10 Other objectives include developing a curriculum for pediatric oncology nursing, building data management capacity, and starting a telecare program to allow doctors in Addis Ababa to consult their colleagues in Georgetown on complex cases.10 There are no data available yet on the effectiveness of this particular twinning program, but future data will hopefully prove this partnership to be an example of how pediatric cancer care can be delivered despite limited primary care infrastructure and a relatively high under-5-year mortality rate.

Addressing Abandonment

Studies have found that rates of treatment abandonment in developing countries can be as high as 60% among pediatric cancer patients.11 Owing to the intensive nature of cancer treatment, families are often required to relocate, resulting in loss of income, which, combined with medical costs for which the family may be responsible, can result in a preventative financial burden. Key to reducing the rate of treatment abandonment is the establishment of programs that provide financial help and supportive services to patients’ families. For example, since the establishment of the Núcleo de Apoio à Criança com Câncer (NACC; the Childhood Cancer Support Center) in Recife, Brazil, which provides lodging,
transportation, and employment for patients’ parents, the treatment abandonment rate for patients with ALL in Recife has plummeted from 16% to 0.5%. Additionally, the NACC manages a tracking system that facilitates contacting patients’ families within 24 hours of a missed visit, preventing extensive interruptions in treatment. The NACC was initially a component of the St Jude-Recife twinning program, but now operates independently, highlighting the sustainable nature of this initiative. In Mexico, a less comprehensive support program has also resulted in a significant decrease in treatment abandonment. After the institution of a government program that covers all medical costs associated with pediatric cancer treatment, the treatment abandonment rate for patients with ALL in Mexico City dropped to less than 1%, and the nationwide abandonment rate for all pediatric cancer patients was reduced to 6.2%. Because ALL is uniformly fatal without treatment and the ALL cure rate in Recife is now 63%, decreases in the rate of abandonment have a significant impact in terms of lives saved.

Expanding Services: Telecare

Telecare is emerging as an important tool for expanding the range of diseases that can be treated by newly established pediatric oncology units. Usually consisting of a video conferencing system with technology for sharing medical imaging or pathology slides, telecare makes remote consultations possible. Telecare is a component of many twinning programs (including the Georgetown-Addis Ababa program discussed above), but can also be used in the absence of such comprehensive programs. Pediatric oncologists at the Hospital for Sick Children in Toronto have used telecare to provide input on neuroblastoma cases seen at the King Hussein Cancer Center in Jordan. An analysis of the 64 patients discussed from 2004-2006 showed that major changes in treatment were recommended for 36% of patients and that these changes were fully executed 91% of the time. Unlike ALL, where the majority of cases can be stratified into a few risk categories then treated effectively using a standardized protocol, the stratification and treatment for other pediatric malignancies is often more complex. Telecare allows the consultation of experts in a particular subfield of pediatric oncology or of physicians who simply have experience treating particular cancers that a newly established pediatric cancer unit may not have great depth of experience with yet.

Discussion

More than 80% of pediatric cancers occur outside of high-income countries, illustrating a clear demand for pediatric oncology care in developing countries. There are numerous opportunities for individuals in academic departments of pediatrics from developed countries to become involved in building sustainable pediatric oncology care programs around the world. Twinning has proven to be an extremely effective way to improve outcomes in pediatric malignancies in developing countries, and expansion of an initially ALL-focused program can be facilitated through telecare. One obstacle to providing pediatric cancer care in developing countries that remains largely unaddressed is case identification. Providing supportive services such as transportation and housing for patients’ families increases the number of patients who will complete treatment, but does not help families to travel to a hospital where their child can be initially diagnosed. To address this issue, primary care infrastructure must be improved and primary care providers must be educated so that they can recognize pediatric malignancies and provide appropriate referrals. Another area that appears to be lacking is formal research training for physicians providing pediatric oncology care in newly developed pediatric oncology units. Although some informal clinical and research training undoubtedly occurs through physician interaction in the context of twinning programs that currently exist, fellowship training programs in academic pediatrics should consider additional clinical and research experiences that will expand expertise in designing and conducting research to monitor and improve patient outcomes. Pediatric oncology departments do not deliver excellent care alone; contributions from pediatric radiologists, surgeons, neurosurgeons, urologists, and other subspecialists are required. Unfortunately, there is often an inadequate supply of these services in locations where new pediatric oncology units are being established. This provides an opportunity for further international training collaborations.

References available at www.jpeds.com
References