

Pediatric oncology services in Nepal

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Abstract

Cancer in children is one of the emerging noncommunicable diseases in Nepal with significant morbidity and mortality. Significant efforts are being made at the government and nongovernment level to provide awareness, early diagnosis, and effective treatment to improve the cure rate of children with cancer. The major challenges include: lack of education, late diagnosis, advanced disease at presentation, financial problems, geographical and transportation difficulties, and inconsistent supply of chemotherapy medicines.

Key words: Cancer, children, Nepal

Country demographics

Nepal is a relatively small developing country located in south Asia, between India and China. The population is estimated to be 26.4 million of which 44% is below 15 years of age.^[1] Infant mortality is 46/1,000 live births and neonatal mortality rate is 33/1,000 live births. Twenty-seven percent of total population lives below the poverty line. This is a major issue, but the national economy is showing positive growth.^[1]

The sex ratio is 94.2 males per 100 females. The literacy rate is 65.9% and economic growth is 3.4%. Crude birth rate is 24.3 per 1,000 people and total fertility rate is 2.6. Under-5 mortality has recently significantly improved and is now around 54/1,000 live births and maternal mortality rate is 168.4/100,000 live births, due to considerable government focus on maternal and child health and disease prevention.

Evolution of pediatric oncology services in Nepal

Childhood cancer care delivery in Nepal is primarily through two government hospitals: One is Kanti Children's Hospital (KCH), the only tertiary level pediatric hospital in Kathmandu, and the other is Bharatpur Cancer Hospital outside Kathmandu valley, near the border with India [Figure 1]. Other government hospitals which provide some service for child cancer are Bir Hospital (National Academy of Medical Science), Bhaktapur Cancer Hospital, and Trivubhan University Teaching Hospital, all of which are in Kathmandu. Radiotherapy services are available at Bir Hospital, Bhaktapur Cancer Hospital within Kathmandu valley and another two centers outside Kathmandu.^[2]

KCH is a 500-bed tertiary level government children's hospital under the Ministry of Health and Population, located in Kathmandu, the capital of Nepal, and established in 1970. In 1990, Dr. A D Shrestha was the first pediatrician to start treating children with cancer at KCH. The first pediatric oncology unit in Nepal was established at KCH in 1994 with four inpatient beds and this has now expanded to 20 beds. The first trained pediatric oncologist, Dr Kailash Prasad Sah, started protocol based treatment in 1999 after completing training in Alder Hey Children's hospital at Liverpool in UK. There are currently two pediatric oncologists at KCH and they follow a combination of European and American protocols which have been adapted locally. Beside these, there are two other pediatric

oncologists in Nepal, one in a private hospital within the valley and one at Bharatpur Cancer Hospital, Chitwan.

KCH has other essential pediatric specialties including surgery, nephrology, cardiology, nutrition, and gastroenterology; and general pediatrics with tertiary level pediatric, surgical, and neonatal intensive care.

There are good basic diagnostic hematology and pathology services. Some limited immunohistochemistry, using a limited number of antibodies has been initiated in the last 6 months. There is a flow cytometer in the unit, but it is not currently functioning. Radiology includes ultrasonography and computed tomography scanning. Radiotherapy for patients at KCH is delivered at the nearby Bir Hospital.

All commonly used chemotherapeutic agents are available in Nepal, although there is some degree of inconsistent supply of drugs. The drugs available include vincristine, methotrexate, 6-mercaptopurine, cyclophosphamide, L-asparaginase, cisplatin, carboplatin, and etoposide. These are all available free of charge to patients as funded by the Kanti Oncology Fund and Ministry of Health. The government of Nepal contributes approximately US \$1,000 per child for treatment.

Epidemiology of childhood cancers

There is no national population based cancer registry in Nepal, but one is planned under the auspices of the World Health Organization. Based on incidence data from the West of approximately 1-1.5/10,000 children per year, we would expect 1,100-1,600 new cases of childhood cancer every year in Nepal.

The number of children with cancer presenting at KCH has been rising since the unit was established in 1994 from 20 cases per year to 110 cases per year at present. The total registered cases in the hospital to date is 1,100, of which only 755 received treatment at our oncology unit. The various childhood cancers treated at KCH are shown in Figure 2. Most brain tumor patients referred to KCH are managed by neurosurgeons and radiotherapists.

The cure rate of cancer at KCH is currently around 40%, with 35% abandonment of therapy due to financial burden and 25% mortality (mainly due to infection, drug toxicity, and relapse).^[3,4]

Cancer programs and support for family

Various nongovernmental organizations (NGOs) have been established to improve cancer awareness and prevention in Nepal, including the Nepal Cancer Relief Society, the Cancer Society Nepal, and Cancer Care Nepal.^[5] There are a few NGOs helping children with cancer in Nepal, but the focus is on treating adults with cancer. There are numerous professional societies that have been working to improve oncology services in Nepal, such as the SAARC federation

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Figure 1: Pediatric oncology centers in Nepal

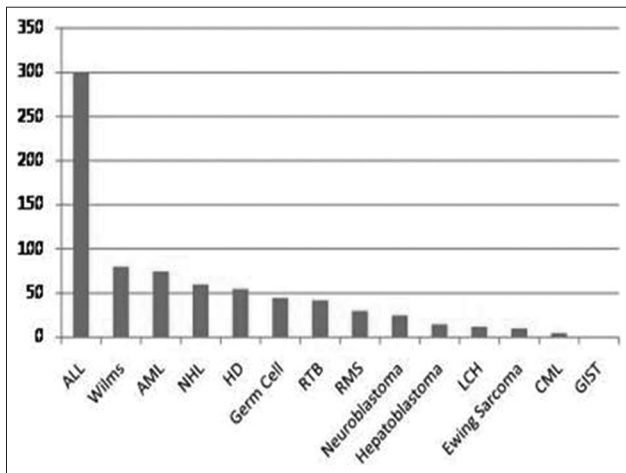


Figure 2: Distribution of 755 children with cancer from March 1998 to March 2012 diagnosed at Kanti Children's Hospital. ALL = Acute lymphoblastic leukemia, AML = Acute myeloid leukemia, NHL = Non-Hodgkin lymphoma, HD = Hodgkin disease, RTB = Retinoblastoma, RMS = Rhabdomyosarcoma, LCH = Langerhans cell histiocytosis, CML = Chronic myeloid leukemia, GIST = Gastrointestinal stromal tumor

of Oncologists - Nepal, the National Society of Therapeutic Radiation Oncology, and the Nepal Oncological Society.

Children to KCH come from all areas of Nepal often travelling long distances and several days from hilly areas. Food is offered free to the children but not the parents. Free accommodation is available for some of the families near the hospital. Children often present late with cancer as a result of poor public and local health worker awareness of the significance of the signs and symptoms of cancer.

Training

We have a general pediatric MD residency program at KCH in affiliation with National Academy of Health Science which includes a 1 month posting in the oncology unit.

Challenges

- Late diagnosis and advanced disease at presentation
- Families refusing treatment and/or stopping treatment prematurely due to financial problems and disbelief in diagnosis
- Most cytotoxics are expensive and there is an inconsistent supply of chemotherapy drugs and antibiotics

- Lack of trained professionals (nurses, doctors, and pharmacists)
- Problems with supportive care including supply of blood products and poor nutrition
- Geographical difficulties regarding transport system.

Priorities

- Health insurance - Government provides \$1,000 for each patient for one time only and this is spent on investigations, diagnosis, and induction treatment. So if there is health insurance provision, patients can get benefit for whole course of treatment
- Proper nutrition - We have one dietician who is involved in the general pediatric unit. As our children are from low socioeconomic conditions, nutrition helps to withstand the toxicity of chemotherapy and its effects
- Laboratory and pathology facilities including genetic studies - Karyotyping, immunohistochemistry, histopathology, and molecular studies (e.g., fluorescence *in situ* hybridization)
- Well-equipped blood bank: At present we just have a simple blood bank which only collects and stores blood for a few days. We do not have well-maintained blood storage equipment, apheresis machine, etc
- Regular supply of medicines: As per government rule we have a tender system to purchase medicines which results in delay of a few months for medicine supply.

Conclusion

Children with cancer who complete treatment have a 40% cure rate. Concerted efforts are being made to raise public and professional awareness, reduce diagnostic delays, improve survival, and subsidize drug and travel costs.

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