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A brief introduction to the Hematology Oncology Center of Beijing Children's Hospital

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The Hematology Oncology Center of Beijing Children's Hospital, affiliated to Capital Medical University is a unique center that integrates clinical care, scientific research, teaching, and training. It is staffed by 269 doctors, nurses, and other health professionals, including one academician and 31 senior medical staff. In addition, 26 staff members are doctoral degree holders and 56 are master's degree holders. Dr. Yamei Hu and her team were the first to carry out clinical research on childhood leukemia in China from 1976.

The Hematology Oncology Center has established four wards and hematological laboratories, with 110 beds available for pediatric patients. There are professional groups treating hematological neoplasms including leukemia, lymphoma, solid tumors, and histiocytosis, as well as hematopoietic stem cell transplant (HSCT) wards. Every year, more than 1000 new pediatric patients with hematological neoplasms are treated in the center; the number of outpatient visits has surpassed 50 000, and more than 100 patients have undergone transplantation.

Childhood blood disorders and tumors are major health concerns; in particular, childhood tumors have become the leading cause of death in this population. Leukemia is the most common childhood malignancy, accounting for about 30% of all malignant tumors in children. Acute leukemia accounts for 95% of childhood leukemia, of which acute lymphoblastic leukemia (ALL) is the most common type, representing about 75% of acute leukemia cases. The incidence of childhood acute leukemia in China is about 4/100 000. Nearly 15 000 new cases of leukemia occur in children under age 15 years of age in China each year. At our center, about 300 children and adolescents with leukemia are treated annually. As the leading unit of national multicenter clinical research on childhood leukemia over the past 10 years, the center has achieved a cure rate of over 80% in childhood ALL, over 60% in acute myeloid leukemia (AML), and over 90% in acute promyelocytic leukemia (APL). In recent years, advances in the clinical application of molecularly targeted therapy and cellular immunotherapy have brought new hope to children with refractory or relapsed leukemia. By the end of 2018, more than 3000 children with leukemia achieved long-term remission at the center. Many of these children have grown up, received a college education, and found employment; they have given birth to over 50 healthy children.

Since its establishment in 2003, the Lymphoma Group has provided standard diagnoses according to international criteria and has adopted stratified treatment and

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targeted therapy. The Group has achieved remarkable accomplishments over the past 10 years. The 5-year disease-free survival rate for Hodgkin lymphoma has reached over 90% and that for various types of non-Hodgkin lymphoma is over 80%. The Group is the leading unit in the China Network for Childhood Lymphomas (CNCL). By the end of November 2018, more than 1200 new cases of lymphoma had been diagnosed and treated within the Network, and 130 new cases are admitted annually. In addition to the comprehensive treatment and management of new patients, the Network also provides systematic management and treatment during outpatient follow-up visits or for patients with long-term complications. The number of outpatient visits attended by the Lymphoma Group is about 10 000 per year.

Established in 2006, the Solid Tumor Group offers multidisciplinary treatment including chemotherapy, surgery, radiotherapy, stem cell transplantation, and long-term follow-up for pediatric patients with malignant solid tumors. By the end of November 2018, more than 2500 patients with newly diagnosed solid tumors (including more than 1000 neuroblastomas) had been diagnosed and treated with multidisciplinary therapy. At present, over 400 new cases of solid tumor are treated annually. The 5-year event-free survival rates in patients with retinoblastoma or medium- and low-risk neuroblastoma is 90% or more.

The Histiocyte Group was established in 2006, making our center the only children's hospital with such a professional team in China. Every year, more than 300 children with Langerhans cell histiocytosis, hemophagocytic syndrome, or chronic active Epstein-Barr virus (EBV) infection are treated by the Group. The Group has adopted the most advanced diagnostic and therapeutic measures, including precise gene-based diagnosis, individualized stratified treatment programs in line with international standards, and second-line treatments for refractory and relapsed patients. Standard operating procedures for the diagnosis, treatment, evaluation, and follow-up of patients have been established to ensure that each patient achieves the best possible outcome after timely diagnosis and effective professional treatment. The Group is a member of the Histiocyte Society. In December 2017, the Histiocyte Group led establishment of the Chinese Childhood Histiocyte Disease Cooperative Group.

Since its establishment in 2001, the Hematopoietic Stem Cell Transplantation (HSCT) Group has offered professional treatment for children with hematological tumors. Nearly 700 patients have been treated using homologous or allogeneic stem cells derived from bone marrow, peripheral blood, or umbilical cord blood that are either human leukocyte antigen (HLA) matched or haploidentical. Haploidentical HSCT has been successfully performed in around 100 children, ranking first among children's hospitals in China. The Group also performed the first CD34-positive HSCT for a pediatric patient in China. Based on protocols recommended by the European Working Group on Pediatric Hematopoietic Stem Cell Transplantation and real-world clinical practice in China, this Group is the first in China to introduce the escort and accompanying system, gastrointestinal nutritional support, and prevention and treatment of fungal infection following transplantation, along with the establishment of HSCT protocols. These efforts have remarkably increased the success rate of transplantation; the rate of survival in transplantation procedures is more than 95%, and the disease-free survival rate is over 70%. Notably, in 2006 the HSCT Group was the first in China to use voriconazole to prevent fungal infection in children after transplantation, which significantly reduced the fungal infection rate in the transplant ward. This practice was adopted 2 years earlier than the release of the European guidelines on fungal prevention in transplant patients. The Group has continuously taken steps to optimize the indications of transplantation. The HSCT Group was the first in the world to conduct HLA-haploidentical HSCT (HLA-haplo HSCT) without T-cell depletion to treat refractory and relapsed Langerhans cell histiocytosis, and two patients were successfully cured. The group successfully treated 10 patients with malignant osteopetrosis using HSCT, showing that allogeneic peripheral blood stem cell transplantation or bone marrow transplantation is superior to umbilical cord blood transplantation. The Group was also the first in China to successfully treat neuroblastoma with umbilical cord blood transplantation. At present, more than 100 children receive transplantation annually, making our center one of the largest childhood HSCT centers in China. In addition, our center is China's largest institution using HLA-haplo HSCT without T-cell depletion to treat childhood non-malignant diseases. Relying on strong multidisciplinary technical support from Beijing Children's Hospital, the HSCT Group has rich experience in performing transplantation procedures for low body weight (weight < 10 kg) patients at a young age (age < 1 year). Compared with other transplantation centers, this Group places great importance on quality of life, nutrition management, and monitoring and intervention of growth and development in pediatric patients before and after transplantation. A palliative care group consisting of doctors, nurses, psychologists, and volunteers has been established to manage pain symptoms in patients, provide psychological counseling to patients and their parents, and to offer one-on-one guidance on hospice care to some families, thus further improve the quality of life of patients.

CONFLICT OF INTEREST

None.

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