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Iranian Childhood Cacer BioBank (ICCBB)

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The 'omics'-based studies have changed the landscape of biomedical research in rare diseases, such as pediatric malignancies. Some barriers such as the limited availability of high-quality biological samples for rare diseases may influence this kind of research. Biobanks as biological resources along with patient-related data are required for personalized medicine and translational research. Indeed, pediatric cancer biobanks have great significance due to their special challenges, including the need for a long-term collection of rare tumors, high tumor diversity, the difficulty of working with children, as well as the limited volume of samples (blood and tissue) in children. Children's cancers have higher molecular heterogeneity and a unique genomic panel, all these cases, make this type of biobank special and require attention. This plan aims to set up a centralized biobank to collect a variety of biological samples in children with newly diagnosed or relapsed in the age range of 0 to 18 years. Iranian Children's Cancer Biobank (ICCBB) is

the first pediatric biobank center in Iran that collects a variety of samples and associated clinical data from patients with a wide range of childhood cancers. The overall goal of ICCBB is to facilitate the advancement of clinical research in the field of pediatric cancer by providing the required quantity and quality of biological samples. To achieve this goal, after developing the infrastructure, and buying and installing the equipment, then ethical committee and meetings with surgeons, oncologists, and pathologists of the centers were held. In addition, standard operating procedures (SOPs) were defined for all aspects of the biobank procedures, including sample collection, processing, storage, and clinical data recording. ICCBB is located at Mofid Hospital in Tehran, Iran. The first phase of the biobank, which includes setting up and equipping, has developed in September 2016. The second phase of the biobank, which is the sample collection phase, started in January 2017. Until today, in July 2022, about 8,000 samples from 720 patients have been collected in the biobank.

Our primary goal was to collect 1200 samples, but it did not happen for the following reasons, the spread of Covid-19 (decrease in patient referrals and increase in personnel duties), lack of a motivated collection team (lack of budget and economic crises), and loss of surgical samples on the evening shift. On the other hand, the following items can be considered as the unique activities of the ICCBB including collecting and storing a variety of biological samples from patients (including plasma, PBMC, serum, urine, and hair) and their parents (plasma and PBMC), cooperation with inter-university centers outside of Tehran (Mashhad and Uremia) and not being limited to sampling from one center and one city, using the vacuum system (TissueSAFE device) to preserve the tissue in a fresh way for the first time in Iran, launching an online database to recording medical data and finally setting up a bilingual website for announcing at the national and international levels. In summary, the samples in the biobank are classified into three categories: leukemia, solid tumors, and central nervous system (CNS) tumors. Patients diagnosed with leukemia accounted for 41% and 294 patients, solid tumors accounted for 40% and 284 patients, and CNS tumors accounted for 16% and 112 patients, of all cancer cases in the biobank. Overall, 82% of the patients were classified as newly diagnosed, and 18% as relapsed patients. Children aged 0-4 are the most age group of patients in biobank with 301 cases (169 boys and 132 girls). In addition to collecting of biological materials, ICCBB records clinical and paraclinical information of the patients in an online database. Due to the challenging nature of the project, a children's cancer biobank with this capacity for sample diversity and Inter-university cooperation has never existed in Iran. Indeed, the gained experiences from the establishment and management of this biobank can be guided for similar projects in the future.