



Landscape of pediatric neuro-oncology care in China

Cancer is a leading cause of childhood mortality in developed regions. Solid tumors account for 60% of pediatric cancers with central nervous system (CNS) tumors being the most common entity (1). Although modern multi-modal treatment strategies have resulted in significant advances in patient outcomes, unique challenges to service delivery exist in low-middle income countries. Competing health priorities, such as neonatal morbidities, infectious disease and accidental injuries divert attention from the enhancement of pediatric neuro-oncology care. Limitation in resource further precludes care to be modelled upon the latest evidence or guidelines, consequentially, provision of care becomes increasingly non-uniform and opinion-based, in turn hampering the improvement in outcome for children with such devastating and relatively uncommon conditions. China has the largest population as a country worldwide with a pediatric population of 271 million [United Nations Children's Fund (UNICEF) data 2015, <17 years of age]. With that, an estimated 10,000 of children are expected to be newly diagnosed with primary CNS tumors in the country, the refinement of care for such conditions along with other malignant solid tumors of childhood has been recognized as a new priority by the National Health Commission of the People's Republic of China (NHC) in August 2019 (2). Challenges to be overcome include the need for better concerted multidisciplinary care, streamlining of referral pathways, ensuring chemotherapy availability, and educational measures to minimize the early abandonment of care. Once a missing element, standardization of treatment approach may in the near future be realized with the publication of national guidelines by the China Anti-Cancer Association (CACA) this year, analogous to the National Comprehensive Cancer Network (NCCN) and European Society for Medical Oncology (ESMO) guidelines in North America and Europe respectively. On the contrary, the rapid advancement in the level of medical care in China represents a golden opportunity to improve the outcome of childhood brain tumors regionally and beyond. The significant patient volume allows clinical trials to be conducted and compared in a timely manner, addressing scientific questions that might otherwise be impractical to investigate in existing pediatric oncology collaborative groups (3). The CCCG-ALL-2015 trial, for example enrolled more than 7,000 patients with acute lymphoblastic leukemia within a 5-year period (4). To realize this goal, diagnostic, therapeutic and research infrastructure needs to be set up among a network of leading referral centers, and understanding the current status of care among these institutions becomes highly relevant.

This special series presents to us representative studies based on experience and perspectives from Chinese healthcare providers. The volume and spectrum of pediatric neuro-oncologic diagnosis in tertiary referral centers can be appreciated by the institutional pan-childhood brain tumor experience by Yu *et al.* of Zhujiang Hospital, Southern Medical University, Guangzhou (*Diagnosis and outcomes of pediatric central nervous system tumors in China: a single-center retrospective analysis from 2015 to 2020*) and Mai *et al.* of Shenzhen Children's Hospital, Shenzhen (*A retrospective study of pediatric brain tumors from a tertiary care hospital in South China*). The difficulty in garnering relevant expertise even within a leading hospital is exemplified by 82 out of 87 patients receiving radiotherapy in outside institutions from the report by Mai and colleagues, while rates of abandonment remain to be significant as illustrated in the Zhujiang Hospital experience. It is nonetheless encouraging to learn about the outcome of patients who are able to undergo multi-modal therapy, inclusive of high-dose chemotherapy which might be potentially used as a radiation-sparing/deferral strategy for infant tumors. On disease-specific cohorts, Su and colleagues from Beijing Children's Hospital (*Clinical features and prognostic analysis of children with medulloblastoma in a single center in China*) as well as Du and colleagues from Children's Hospital of Soochow (*Clinical characteristics and prognosis of pediatric medulloblastoma: a cohort study of 40 patients at Children's Hospital of Soochow University*) focused on patients with medulloblastoma—the most common malignant CNS tumors in childhood which has a molecular subtyping system that has evolved to become increasingly sophisticated, while Lu and colleagues also from Soochow (*Pediatric intracranial ependymoma—a single-center clinical analysis and literature review*) described the characteristics of 33 children with ependymoma, another common childhood onset tumor that necessitates timely multimodal therapy. On top of the above original studies, Xu and colleagues adopted a neurosurgical perspective for a literature review on pediatric epilepsy-associated glioneuronal tumors (*Clinical management of epilepsy associated with low-grade glioma and literature review*), while Zhang and colleagues meta-analyzed the Chinese data on the important theme of CNS germ cell tumors—an entity with an incidence that is 2–3 times higher in Asians than in the Western population (5).

With the relative underrepresentation of pediatric neuro-oncology literature from the Chinese group, this compilation

represents an exciting and timely reference set to allow a glimpse of the current service provision among leading institutions in the Country. Such efforts should serve as a starting point for endeavors to ensure the availability of the best treatment for children with CNS tumors regardless of where they are born.

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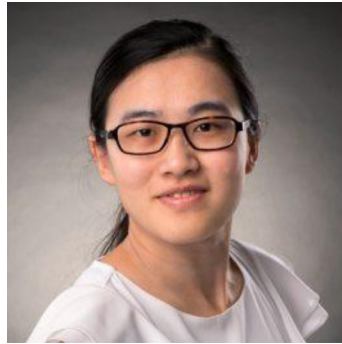
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