What is targeted therapy for gliomas in children and adults?

Gliomas can be either low grade (LGG) or high grade (HGG) including anaplastic oligodendroglioma, anaplastic astrocytoma and glioblastoma multiforme.

Significant improvements have been made for initial therapy of HGG, especially in adults with combined chemoradiation using low dose temozolomide followed by temozolomide chemotherapy and abnormal cancer cell signalling, often due to gene mutations of components in these pathways.

Therapies that target specific proteins are known as targeted therapies. Recent studies of HGG have identified key growth factors and their receptors, including the vascular endothelial growth factors (VEGF) and epidermal growth factors or their receptors, blocking glioma cell communication, growth and division.

Some targeted therapies have shown promise in patients with recurrent disease and are being studied in newly diagnosed HGG patients by adding them to standard treatment. However, the effectiveness of targeted therapies usually decreases over time since HGG are able to find ways to grow and invade normal brain despite specific treatment.

There is no established use for targeted therapies in LGG in children or adults outside of a clinical trial. However, there are special indications in LGG patients with inherited disorders such as Neurofibromatosis Type I (NFI) or Tuberous Sclerosis with subependymal giant cell astrocytoma (SEGA).

Patients with HGG are being entered on clinical trials to determine the best way to use these new drugs, including how to combine them with chemotherapy and identify which individual patients can benefit from their use. To date, most of these targeted therapies have shown less promise in children when compared to adults, suggesting that most pediatric HGG have a different biology than adult HGG.

Thank you to Dr. David Eisenstat, MD, MA, FRCP, Director of Neuro-Oncology: Adult and Pediatric; CancerCare Manitoba; Winnipeg, MB. Dr. Eisenstat is a member of the Professional Advisory Group for Brain Tumour Foundation of Canada.