Convection Enhanced Delivery of $^{124}$I-8H9 for Diffuse Intrinsic Pontine Glioma: A Novel Surgical Approach

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DISCLOSURE

Memorial Sloan Kettering has exclusively licensed the 8H9 used in this trial to a pharmaceutical company for commercial development.

ABSTRACT

Diffuse intrinsic pontine glioma (DIPG), a lethal type of childhood brain cancer that is inoperable, remains largely intact within 3–8 months of diagnosis, with minimal scatter and long tract signs including hyperreflexia, +Babinski, weakness in face, arms, or legs, and eventually uncontrollable weakness in facial muscles. This is the first time $^{124}$I-8H9 has been administered in this patient population. After hospital discharge, the patient will be seen weekly for one year to assess for tumor progression and maintain convective flow.

TECHNIQUES

DIPG (Diffuse Intrinsic Pontine Glioma)

Current treatment for DIPG is radiotherapy to the brain stem. Single infusion. Dose: 54-60 Gy to the brain stem. Minimum of 4 weeks but no more than 14 weeks. Patients with non-progressive DIPG are referred to the pediatric neuro-oncology team based on MRI and clinical evidence.

TREATMENT PLAN: Dose Levels 1–10

Anticipated Toxicities/Side Effects

Adverse events include: 1. Infection 2. Fever 3. Headache 4. Pain, 5. Weakness in face, arms, or legs 6. Uncontrollable weakness in facial muscles. This is the first time $^{124}$I-8H9 is being used along with CED in the brain stem.

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Dr. Maria Donzelli, MSN, RN, CPNP, RESEARCH NURSE PRACTITIONER

ROLE/RESPONSIBILITIES OF THE CLINICAL RESEARCH NURSE PRACTITIONER

• Inaccurate term data collection
• Surveillance of radiation safety
• Monitor for DLTs (dose limiting toxicities)
• Update the 8H9 infusion
• Follow radiation safety precautions

CLINICAL TRIAL STATUS

Estimated Enrollment = 64

OPEN TO ACCRUAL

Follow radiation safety

CLINICAL PATIENTS

Project Title: B7-H3, a potential agent

Tumor progression within 3-8 months

High grade malignant solid infiltrative tumor

Tumor diagnose is NOT required.

Post Operative Care

Monitor of 9 patients so far, no toxicities

B7-H3 tumor antigen that is expressed by the DIPG tumor cells.

124

I-8H9 is a radioactive iodine labeled monoclonal antibody

$^{124}$I + 8H9 = Targeted Radioimmunotherapy (RIT)

124

I-8H9 antibody is infused directly into the tumor

124

I-8H9 in this patient population.

The MSK CED trial with convection-enhanced delivery in the treatment of brain tumors. WHERE DO WE GO FROM HERE?

Continue to evolve with new understanding of the technique and the disease.

WHERE DO WE GO FROM HERE?

Future aspirations for $^{124}$I-8H9 include:

• Identifying the right agents for evaluation

• Developing better agents and treatment regimen for better and accurate clinical results

• Single radiation isotope system as multi-radiation injection system

• Optimal modeling and control of drug distribution清除

• Development of computer algorithms/predictive drug delivery systems

• Prognostic signatures to improve immune or pharmacological response to the technique


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