Phase 1/2 Clinical Trial of Autologous Hematopoietic Stem and Progenitor Cell Gene Therapy for Cystinosis

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We will share updated results from an ongoing clinical trial (NCT03897361) testing the safety and effectiveness of CTNS-RD-04 in adults with cystinosis. CTNS-RD-04 is made from a patient's own blood stem cells (CD34+ HSPCs) that are genetically modified using a virus-based tool called a lentiviral vector (LV) to carry a working copy of the CTNS gene.

To create CTNS-RD-04, stem cells are collected from the patient's blood after a treatment that encourages their release. These cells are then modified with the functional CTNS gene. Before receiving the modified cells, patients undergo a chemotherapy treatment (busulfan) to prepare their body for the infusion. Oral and topical cysteamine treatments are stopped before the infusion takes place.

The clinical trial is now fully enrolled, with six participants between the ages of 20 and 46 receiving the treatment (CTNS-RD-04). They have been monitored for periods ranging from two to over five years. The amount of modified stem cells given varied, and the effectiveness of the treatment depended on how many copies of the genetic modification (vector copy number; VCN) were present in the blood.

At the two-year mark, these levels of VCN ranged from 0.51 to 2.67. There have been no serious side effects or negative reactions to CTNS-RD-04. Over time, cystine levels in white blood cells and cystine crystals in the skin have decreased, with better results in those who had higher levels of the modified cells. Two participants (Patients 4 and 5) with lower VCN levels restarted cysteamine treatment. Another participant (Patient 2) did not continue with long-term follow-up visits. Updated findings will be shared.