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The MIST Phase 2 clinical trial, supporting the potential of hematopoietic (blood cell-producing) stem cell transplant (HSCT) to significantly slow disability progression in highly active relapsing-remitting multiple sclerosis (RRMS) patients, has received a Distinguished Clinical Research Achievement Award from the Clinical Research (CR) Forum.

Five years after the transplant, most treated patients showed no further disease progression or activity, a press release announcing the honor stated.

The CR Forum is a nonprofit association of clinical research experts and leaders at leading academic health centers in the U.S. Each year, it recognizes exceptional studies through its Top 10 Clinical Research Achievement Awards.

Two of these awards are considered Distinguished Clinical Research Achievement Awards, and highlight clinical studies whose creativity, innovation, and novelty

carry great promise for patients. Each carries a cash prize of $5,000.

One Distinguished Award was given to Richard Burt, MD, the chief of Northwestern Medicine's immunotherapy for autoimmune diseases division, who pioneered the use of HSCT to treat relapsing MS.

His project is titled "Hematopoietic Stem Cell Transplantation for Frequently Relapsing Multiple Sclerosis."

HSCT is an intensive therapy that rebuilds a patient's immune system. The first step is to collect a patient's own (meaning, autologous) healthy hematopoietic stem cells from the bone marrow, followed by a fairly non-aggressive combination of chemotherapy (non-myeloablative) that kills the rest of the patient's immune cells.

The hematopoietic stem cells are then infused back to the patient to generate a new, and healthy immune system.

The MIST Phase 2 clinical trial (NCT00273364), led by Burt in collaboration with an international team of researchers, compared the efficacy of non-myeloablative HSCT to continuous disease-modifying therapy (DMT) use.

A total of 110 patients, ages 18 to 55, with aggressive RRMS were enrolled. All had at least two relapses while undergoing treatment with a DMT in the previous year.

Patients were equally randomized to a chemotherapy regimen plus a suppressant of the immune system (to prevent HSCT rejection), followed by HSCT (55 patients), or — as a control group — to a stronger DMT, different from the one they had taken the previous year (55 patients).

The control group was given a wide selection of DMTs to choose among, including interferons, Tysabri (natalizumab), Tecfidera (dimethyl fumerate), Gilenya (fingolimod), Copaxone (glatiramer acetate), and Novantrone (mitoxantrone). Other immune therapies in the control group included corticosteroids, Cytoxan (cyclophosphamide), and rituximab.

Results, published in the journal JAMA in 2019, showed that significantly fewer patients in the HSCT group experienced disease progression (three out of 52) after one year compared to those in the DMT group (34 out of 51).

Progression did increase over time, but at a significantly lesser rate in the HSCT group.

Over the first year post-transplant, 36 patients in the DMT group experienced a relapse, while one patient relapsed in the HSCT group. During this period, scores on the Expanded Disability Status Scale (EDSS; a method of quantifying disability in MS with higher scores corresponding to greater disability) decreased in the HSCT group, dropping from 3.38 to 2.36. Scores over that year in the DMT group the score rose from 3.31 to 3.98.

Patients in the HSCT group also showed significantly less disease activity on MRI scans after one year.

No patient died during the study, and no potential life-threatening events (cardiac failure or generalized infection affecting multiple organs, called sepsis) occurred in the HSCT group.

HSCT's use is also thought to translate to a lower financial burden on both private insurance companies and public health, the release states. HSCT is estimated to have a one-time cost of around $98,000, while other MS therapies carry a yearly cost of around $80,000 and are required throughout a person's lifetime.

Most importantly, the CR Forum notes, HSCT achieved for the first time what no other therapy has — the ability to nearly halt disease progression and relapses.

"Most patients show no further progressive disability or evidence of new disease activity over 5 years. HSCT is markedly superior to the current, ongoing drug therapies in preventing relapses, slowing disease progression, decreasing the burden of disease in the brain, and improving a patient's quality of life," the release states .

The other Distinguished Clinical Research Achievement Award was given to the

CREDENCE Phase 3 trial, led by Kenneth Mahaffey, a professor of medicine (cardiovascular medicine) at the Stanford University Medical Center.

This randomized study (NCT0206579) enrolled 4,401 people with type 2 diabetes and kidney disease due to diabetes. Patients were randomized to canagliflozin (sold as Invokana, among other brand names) or a placebo.

Results showed that canagliflozin lowered the risk of kidney failure by 30% in these patients, marking the first time a therapy has lowered the risk of kidney failure in this patient group. Treatment with canagliflozin lowered the risk of death due to heart attacks and strokes, as well as the rate of hospitalization due to heart failure.

Finally, The Herbert Pardes Clinical Research Excellence Award, which has a $7,500 prize, when to researchers who developed and studied an innovative skin-like sensor that is placed on an infant's chest and foot to allow closer monitoring of health using wireless technology. According to the release, such monitoring "dramatically improves medical outcomes for the most fragile patients," like premature infants.

The study was led by John Rogers and his engineering team at Northwestern Feinberg School of Medicine in collaboration with clinicians.

"This year's award winners demonstrate the immense value of our nation's investment in clinical research, and the direct impact of that work on the health of millions of people in the United States," Harry P. Selker, MD, CR Forum board chair and dean of the Clinical and Translational Science Institute at Tufts University, said in the release.

"For many, these innovative studies and related clinical trials may represent the only hope for surviving a life-threatening disease. They also pave the way to advance new therapies and treatments that improve public health," Selker added.

The full list of the 2020 Top 10 Clinical Research Achievement Awardees is available here.