Wave of New Therapies Improve Outcomes for Patients with Multiple Myeloma

New drugs to treat multiple myeloma are producing better results for patients, with fewer side effects.

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For many patients with multiple myeloma, a new generation of drugs and drug combinations is producing better outcomes and fewer side effects. In recent months, several novel therapies studied and tested by Dana-Farber scientists have gained approval from the U.S. Food and Drug Administration (FDA) or taken a step toward approval after posting solid results in clinical trials.

The drugs are the fruit of years of research into improving treatment for multiple myeloma, a cancer of white blood cells known as plasma cells in the bone marrow. Many of the new agents are biologically derived — made from substances such as proteins and antibodies found in living things — and target biological mechanisms in a very specific, targeted fashion. Dana-Farber researchers have played a key role in these efforts.

“These are each powerful examples of how next-generation novel therapies translated here at Dana-Farber from bench to bedside are further improving outcomes for our patients, and at a remarkable pace,” says Paul G. Richardson, MD, clinical program leader and director of clinical research at the Jerome Lipper Multiple Myeloma Center at Dana-Farber.

Option for relapsed or refractory (non-responsive) myeloma

Following a Dana-Farber-led clinical trial, the FDA recently approved the novel drug isatuximab in combination with pomalidomide and dexamethasone for adults with relapsed or refractory (non-responsive) myeloma who have received at least two prior therapies, including lenalidomide and drugs known as proteasome inhibitors. The drug went into trials after laboratory work by Dana-Farber’s Yu-Tzu Tai, PhD, and Kenneth Anderson, MD, showed it was active against myeloma cells. In the clinical trial, the three-drug combination lowered the risk that the disease would progress by 40%, compared to pomalidome and dexamethasone alone.

A drug that doesn’t cause hair loss

Dana-Farber investigators conducted laboratory research and led the first clinical trial of the drug

melflufen plus dexamethasone in patients with relapsed or refractory myeloma. Melflufen is a “peptide conjugate” drug — made of a stub of protein, or peptide, joined to a chemotherapy agent — and delivers a toxic payload directly to myeloma cells in a selective, time-sparing approach.

Results from an early-phase clinical trial published in Lancet Oncology showed the drug is active in patients with myeloma and is safe at recommended doses. Unlike the previously used standard drug melphalan, it doesn’t cause mucositis — inflammation of membranes within the digestive tract — or hair loss. The results prompted investigators to launch two larger trials, some of whose results are being processed and are due to be published soon.

Drug for patients eligible for stem cell transplant

In a major study published in Blood, Dana-Farber researchers and their associates found that in patients newly diagnosed with myeloma who are eligible for a stem cell transplant, adding the drug daratumumab to the standard three-drug regimen produced more responses, and deeper responses, than in patients receiving the three-drug therapy alone.

Targeting myeloma cells and cell division

Dana-Farber researchers were involved in the development and initial testing of the drug belantamab mafodotin, which has shown considerable promise in clinical trials and has been granted priority review for approval by the FDA.

An antibody conjugate drug consisting of an antibody that specifically targets myeloma cells and an agent that disrupts cell division, its use was informed by a preclinical trial at Dana-Farber involving Yu-Tzu Tai, PhD, and Kenneth Anderson, MD. Balantamab mafodotin was tested in studies led by Paul Richardson, MD, in patients with relapsed or refractory multiple myeloma whose disease continued to worsen after a stem cell transplant, chemotherapy, or other treatment. In the DREAMM-1 and -2 trials, the drug showed strong anti-myeloma activity with manageable side effects.

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