

EMBARGOED UNTIL
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Targeted marrow irradiation reduces side effects for bone marrow transplant patients

DUARTE, Calif. — Patients with multiple myeloma and acute leukemia undergoing hematopoietic cell transplantation (HCT) tolerated higher doses of radiation and reported reduced side effects when they received a therapy known as targeted marrow irradiation (TMI) using helical TomoTherapy. Clinical researchers from City of Hope, who were the first in the U.S. to develop and test TMI, presented data from clinical trials employing the experimental therapy at the 49th Annual Meeting of the American Society for Therapeutic Radiology and Oncology in Los Angeles.

City of Hope has treated 24 patients with dose-escalated TMI as part of their HCT procedure, and all were successful with none, to date, experiencing any disease progression or cancer recurrence. Multiple myeloma and acute leukemia are hematological cancers that affect the bone marrow and blood. An HCT, also commonly known as a bone marrow transplant, offers a possible curative treatment or prolonged remissions for these diseases. As part of the HCT procedure, patients receive chemotherapy and/or total body irradiation in preparation for the transplantation of new hematopoietic stem cells. Older patients, who make up the majority of the multiple myeloma population, are often unable to undergo HCT because they cannot tolerate the toxicity of total body irradiation.

“Targeted marrow irradiation offers a new therapeutic agent to patients who need hematopoietic cell transplantation but who cannot tolerate treatment with standard total body irradiation,” said Jeffrey Wong, M.D., chair of the Division of Radiation Oncology and Radiation Research at City of Hope and one of the principal investigators of the clinical trials on TMI. “We are seeing in these studies that we are able to escalate doses beyond those possible with conventional total body irradiation while reported side effects such as mucositis, diarrhea, nausea and vomiting are reduced.”

TomoTherapy machines incorporate spiral computed tomography, or CT, scanning and external beam radiation to deliver controlled doses to targeted areas of the body, with significantly reduced radiation exposure to surrounding healthy tissue. Instead of treating patients with wide beams of radiation therapy that exposes the entire body, radiation oncologists can use TomoTherapy to deliver therapy directly to the areas that need it, in this case bone marrow and lymph nodes, while sparing vital organs and healthy tissue in the surrounding areas. Study data show that patients who received TMI reported fewer episodes of the most commonly reported side effects associated with total body irradiation, including nausea, vomiting, diarrhea and mucositis, the inflammation of mucus membranes along the digestive tract.

“While the median follow-up time with these patients is short at 13.4 months, the data do suggest that TMI reduces short term toxicities and that the targeted radiation doses do not seem to be detrimental to cancer outcomes,” said Wong. “The use of TomoTherapy and TMI provides full intensity radiation therapy to where it’s needed most, and reduced intensity to where it’s not, which seems to result in an improved experience with fewer side effects.”

Studies evaluating TMI are continuing in order to establish the highest tolerable dose and to more completely identify the range of patients who may be eligible for HCT procedures with the use of TMI in place of total body irradiation.

About City of Hope

City of Hope is a leading research and treatment center for cancer, diabetes and other life-threatening diseases. Designated as a Comprehensive Cancer Center, the highest honor bestowed by the National Cancer Institute, and a founding member of the National Comprehensive Cancer Network, City of Hope's research and treatment protocols advance care throughout the nation. City of Hope is located in Duarte, Calif., just northeast of Los Angeles, and is ranked as one of “America’s Best Hospitals” in cancer and urology by *U.S. News & World Report*. Founded in 1913, City of Hope is a pioneer in the fields of bone marrow transplantation and genetics. For more information, visit <http://www.cityofhope.org/>.

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