Stem Cells Could Prevent Tissue Damage Caused by Radiotherapy

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DURHAM, N.C. (PRWEB) November 19, 2018 -- A new study in STEM CELLS Translational Medicine indicates mesenchymal stem cells (MSCs) are a safe and innovative option to heal normal tissue following radiotherapy. Alain Chapel, Ph.D., and Annette Larsen, DVM, Ph.D., of the Institut National de la Santé et de la Recherche Médicale (INSERM) in France led the team that conducted this research.

More than 14 million new cases of cancer are diagnosed globally each year, according to the National Institutes of Health. Of those, half could benefit from radiation therapy. However, radiotherapy can cause substantial damage to a patient’s normal tissue. Mesenchymal stem cells (MSCs) have been used to help alleviate this damage, but their potential to lead to residual tumor cells is worrisome.

In a test, conducted on rats with colon cancer, MSCs not only protected healthy tissue from radiation damage by increasing the levels of growth factors, they also reduced the development of residual tumor cells and slowed disease progression in the absence or presence of radiotherapy.

“In fact, treatment with the bone marrow-derived MSCs decreased the number and the size of the tumors by half, thereby prolonging animal survival. These beneficial effects were seen up to one year after the last MSC administration, most likely due to polarization of resident MSCs and immune cells,” Dr. Chapel said.

“We believe this shows that MSCs have durable action on colon cancer development by modulating the immune component of the tumor microenvironment,” added Dr. Larsen. “Our findings also support the use of MSC administration for treatment of severe radiation damage in patients.”

Accordingly, the two reported, a new phase 2 clinical trial evaluating the efficacy of systemic MSC injections for the treatment of chronic radiotherapy-induced abdomino-pelvic complications is scheduled to start this year (ClinicalTrials.gov Identifier: NCT02814864).

“Outcomes from this study highlight several important aspects of mesenchymal stem cell therapy in the context of solid tumors progression, supporting their use in radiotherapy for cancer patients as a safe and innovative therapeutic option to heal normal tissue,” said Anthony Atala, M.D., Editor-in-Chief of STEM CELLS Translational Medicine and director of the Wake Forest Institute for Regenerative Medicine.

The full article, “Mesenchymal stem cell administration attenuates colon cancer progression by modulating the immune component within the colorectal tumor microenvironment,” can be accessed at https://stemcellsjournals.onlinelibrary.wiley.com/doi/abs/10.1002/sctm.18-0117.

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