



Journal of Medical Sciences

ISSN 1682-4474

science
alert

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Stem Cell Treatment Is Effective for Certain Cases of Acute Leukemia

Some adults and children with acute leukemia could benefit from certain transplants of blood stem cells, but the benefits are not equal across all cases of leukemia, according to a new review of 15 studies.

Acute leukemias -- classified as either acute myeloid leukemia (AML) or acute lymphoblastic leukemia (ALL) -- are fast-moving cancers that attack the bone marrow and blood. Along with chemotherapy, the treatment for the disease can include transplanting stem cells that can replenish the body's supply of healthy blood cells.

The new stem cells can come from donors, such as a patient's sibling, whose blood cells carry matching molecular markers to the patient. The transplant can also be made using some of the patient's own stem cells.

Stem cell therapy is an alternative treatment that could "reduce the risk of relapse or even cure the disease when chemotherapy alone fails to eradicate the disease," said review co-author Yen-Fu Chen, Ph.D., of the University of Birmingham, in England, and project leader from the West Midlands Health Technology Assessment Collaboration.

However, the transplants, used in place of or along with chemotherapy, have varying rates of success "depending on the type of leukemia and certain risk factors that individual patients possess," said Khalid Ashfaq, M.D., the first author of the review.

The review is published in the latest issue of Health Technology Assessment, the international journal series of the Health Technology Assessment program, part of the National Institute for Health Research in the United Kingdom.

The researchers found that treatment using a sibling's stem cells might be more effective than chemotherapy in children and adults with AML who have entered their first remission from the disease. "This is the case except in some adults, who have a good risk profile," said Chen. Adults with ALL in their first remission also live longer and suffer fewer relapses with the stem cell transplants, they found.

When using the patient's own stem cells, however, stem cell treatment generally fared no better -- and sometimes fared worse -- than chemotherapy, according to Chen and colleagues.

The 15 analyses reviewed by the researchers, which comprised more than 2,000 patients, revealed several significant gaps in the evidence about stem cell treatments. For patients who had suffered more than one relapse of their leukemia, for instance, there were not enough data to say whether a stem cell transplant would be a better treatment than chemotherapy.

Decisions surrounding the specific techniques used in the transplantation, "such as to what extent the patient's blood generating system needs to be destroyed before the transplant, using different conditioning regimes," Chen said, might also play a role in how well a stem cell treatment works. Yet, "there is not enough good-quality evidence to really be able to make a recommendation at the moment," he added.

"It is encouraging that several clinical trials addressing this issue are underway, and we will have much more evidence to answer the question in a few years' time," Chen said.

The study also looked into whether stem cell transplantation for treating acute leukemia "is of good value for the money" under various health services plans internationally, but there was not enough information on cost "for a comprehensive assessment," Ashfaq said.

Journal Reference: 1. Ashfaq K, et al. Clinical effectiveness and cost-effectiveness of stem cell transplantation in the management of acute leukaemia: a systematic review. *Health Technol Assess*, 2010; 14(54)