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tem cells from healthy young donors, delivered via intravenous
infusion to frail older adults, were shown to reduce inflammation
in a small pilot study reported today at the International
Conference on Frailty and Sarcopenia Research (ICFSR). “These
findings suggest that stem cells may have the potential to reverse
some of the most debilitating effects of aging that result from
chronic inflammation and a decline in immune function”, according
to Joshua M. Hare, M.D., Chief Science Officer of Longeveron LLC
and Director of the Interdisciplinary Stem Cell Institute at the
University of Miami Miller School of Medicine.

Frailty, a multi-system syndrome that reflects decreased resilience
to a range of stressors, has been increasingly recognized as a
major cause of functional decline and adverse health outcomes
in older adults. Chronic inflammation and other impairments in
the immune system are thought to play a major role in the
development of frailty. Adult stem cells derived from bone marrow
– called mesenchymal stem cells (MSCs) -- have been shown to
have potent anti-inflammatory properties. This trial tested the
hypothesis that MSCs from the bone marrow of healthy young
donors (called allogeneic cells – allo-hMSCs -- because they come
from an unrelated donor) would reduce inflammation and improve
function in frail older adults.

The trial enrolled 15 participants, aged 60-95, who met frailty
criteria established by the Canadian Study on Health and Aging.
Participants were randomized into three groups that received
intravenous infusions of 20, 100, or 200 million allo-hMSCs. The
infusions were well tolerated, with no treatment-related serious
adverse events. Blood tests at baseline and at 6 and 12 months
after the infusions showed a dose-related reduction in markers
of inflammation as well as a decreased number of “exhausted”
B cells. B cells are the immune cells responsible for producing
antibodies in response to infection, and the exhaustion of B cells
along with age-related declines in other aspects of immune
function results in “immunosenescence,” characterized by impaired
response to vaccines and increased susceptibility to infections.
Since the group receiving 100 million allo-hMSCs showed the
best response, a second infusion at that dose was given at 12
months, resulting in continued improvement of inflammatory and
immune markers and suggesting a revitalization of the immune
system.

“This is extremely important because what happens as we age
is that we have a chronic low level of inflammation. With MSCs,
not only are we reducing serum levels of inflammatory molecules
but also reversing immunosenescence.” said Ana Marie Landin,
PhD, a scientist at the Interdisciplinary Stem Cell Institute at the
University of Miami Miller School of Medicine, and first author
of this study.

The investigators will present additional data from this study –
including data on changes in physical function and quality of life
-- at a poster session on Saturday, April 29th, at 10:30 a.m. Building
on the positive results in the pilot study, the team moved on to
a larger, randomized placebo controlled trial. Results of that study
will be published in the near future in the Journal of Gerontology.
Co-authors of this study (www.clinicaltrials.gov: #NCT02065245)
include Principal Investigator Joshua M. Hare, MD, Chief Science
Officer of Longeveron LLC and Director of the Interdisciplinary
Stem Cell Institute (ISCI) at the University of Miami Miller School
of Medicine; Audrey S. Medina and Anthony A. Oliva, PhD from
Longeveron; Aisha Khan from ISCI; and Pascal Goldschmidt-
Clermont, from the division of cardiology at the University of
Miami Miller School of Medicine. Longeveron is a regenerative
medicine company which focuses on disease of aging, including

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