



Science Reveals Benefits of Adult Stem Cells

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For most of us, what we know about the stem cell debate comes from the news media. Unless you have access to peer-reviewed medical journals and scientific publications (which most of us do not), you probably rely on what you hear on the news or read in the newspaper. But, do you wonder what scientists are discovering in regard to stem cell research? For instance, did you know the evidence in favor of adult stem cell therapy continues to grow within scientific literature?

Despite all the hype surrounding embryonic stem cell research, there has yet to be a single peer-reviewed article that examines actual benefits in the use of these cells in humans. Compare that to a long list of published studies that demonstrate the successful use of adult stem cells in human patients.

In order to help sort through the science, the following is a small sample of the scientific literature which shows some of the ways adult stem cells are being used to treat patients with a wide variety of diseases. We would show you the published reports of embryonic stem cell research in humans but there aren't any. Click on the links below to see the adult stem cell therapies being used to treat the following diseases.

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Autoimmune Diseases

Arthritis, lupus, Sjogren's syndrome

After no improvement with traditional therapy, twenty-six patients were treated with their own stem cells. Patients with lupus and rheumatoid arthritis showed significant improvement. The patient with Sjogren's syndrome remained symptom-free for more than four years.¹

Crohn's Disease

A young female patient in Spain was successfully treated with her own stem cells for complications associated with Crohn's disease.²

Twelve patients who did not improve with conventional therapies received treatments which included stem cells from blood circulating in the body (peripheral blood stem cells). Over 18 months later, 11 out of 12 patients remained symptom free – with no recurrence or flare-up of the disease.³

Finally, 4 patients with 8 deeply penetrating ulcerations were injected with stem cells derived from the patients' own fat cells (adipose tissue). Seventy five percent of these ulcerations were completely repaired within weeks.⁴

Lupus

A child with severe systemic lupus was treated with her own stem cells and – within days – began to experience substantial progress. Almost four years later (at the completion of the study), the girl remained in complete remission.⁵

Blood-derived stem cells were part of a therapy used to treat adult patients suffering from severe lupus. More than two thirds (65%) of the patients experienced significant clinical improvement.

¹ . Leng, XM, A Pilot Trial for Severe, refractory Systemic Autoimmune Disease with Stem Cell Transplantation, *Chinese Medical Science Journal*, Sept, 2005.

² Garcia-Olmo,D, Autologous Stem Cell Transplantation for Treatment of Rectovaginal Fistula in Perianal Crohn's Disease: A New Cell Based Therapy, *Int J Colorectal Dis.*, May 23, 2003.

³ Oyama, Y, Autologous Hematopoietic Stem Cell Transplantation in Patients with Refractory Crohn's Disease, *Gastroenterology*, March 2005.

⁴ Garcia-Olmo,D, A Phase I Clinical Trial of the Treatment of Crohn's Fistula by Adipose Mesenchymal Stem Cell Transplantation, *Dis Colon Rectum*, July 2005.

⁵ Chen, J., Use of CD34+ Autologous Stem Cell Transplantation in the Treatment of Children with Refractory Systemic Lupus Erythematosus, *Clinical Rheumatology*, Sept, 2005.

Systemic sclerosis, systemic lupus, amyopathic dermatomyositis, and Wegener's granulomatosis

Eight patients with a variety of diseases (listed above) underwent treatment that included stem cells gathered from blood circulating in the body (peripheral blood stem cells). The patients with systemic sclerosis experienced substantial advances. Those with interstitial pneumonia had noteworthy signs of improvement. In addition, the size of granuloma lesions decreased in the patient with Wegener granulomatosis.⁶

Cancers

Brain tumors

Children with high-risk, reoccurring brain tumors were treated with chemotherapy and their own stem cells. After a year and a half, 13 of the 35 children (37%) were successfully treated with no complications. After two years, the survival rate among those treated was approximately 37% overall, 57% in children with high-risk brain tumors, and 71% in children under 4 years old with high-risk brain tumors.⁷

Leukemia

Normally, infant acute leukemia has a very poor prognosis when treated with conventional chemotherapy. In contrast, treatment of twenty-six infants with leukemia demonstrated drastically increased success rates with stem cell treatments.⁸

Lymphoma

A study with one hundred ninety-seven patients with lymphoma was divided into two groups. One group received treatment with traditional chemotherapy. The other group received chemotherapy and a treatment of their own stem cells. After 5 years, the survival rate among patients that received the stem cell treatment was significantly higher (55%) than those receiving only chemotherapy (37%).⁹

⁶ Tsukamoto H, A Phase I-II Trial of Autologous Peripheral Blood Stem Cell Transplantation in the Treatment of Refractory Autoimmune Disease, *Ann Rheum Dis*, Aug 26, 2005.

⁷ Martinez, Perez A, High-Dose Chemotherapy with Autologous Stem Cell rescue in Children with High-Risk and Recurrent Brain Tumors, *An Pediatr (Barc)* July 2004.

⁸ Marco, Fernando, High Survival Rate in Infant Acute Leukemia Treated with Early High-dose Chemotherapy and Stem Cell Support, *Journal of Clinical Oncology*, Sept 2000.

⁹ Milpied, Noel, M.D., Initial Treatment of Aggressive Lymphoma with High-Dose Chemotherapy and Autologous Stem-Cell Support, *NEJM*, March 25, 2004.

Ovarian Cancer

One hundred eighty-seven women with ovarian cancer were treated with chemotherapy and their own stem cells. Despite the poor prognosis normally associated with ovarian cancer, 70% of the women responded positively – and almost 50% had complete success with this treatment.¹⁰

Renal Cell Carcinoma

When this cancer metastasizes, patients have an extremely poor prognosis and often survive less than a year. Nineteen patients were treated with stem cells gathered from blood circulating in the body (peripheral blood stem cells). Ten patients experienced regression of the disease and three were completely cured (lasting up to 27, 25, and 16 months).¹¹

Retinoblastoma

Despite the high mortality rate associated with malignant tumors of the eye (known as metastatic retinoblastoma), two of four patients at St. Jude Children's Hospital were successfully treated with intensive chemotherapy and their own blood-derived stem cells.¹²

At Memorial Sloan-Kettering Cancer Center, four patients with eye tumors were successfully treated with a combination of chemotherapy, radiation, and their own stem cells. After 4-7 years, all four patients remained disease-free.¹³

Tumors were found in the lymph nodes, bone, and bone marrow of a 7-year-old-girl after her left eye had been removed to treat the cancer. She received chemotherapy and treatment with her own stem cells. The girl was still in remission at the end of the study – more than four years later.¹⁴

Testicular Cancer

¹⁰ Stiff, Patrick J., *High-Dose chemotherapy and Autologous Stem-Cell Transplantation for Ovarian Cancer: An Autologous Blood and Marrow Transplant Registry Report*, *Annals of Internal Medicine*, October 2000.

¹¹ Childs, Richard, M.D., *regression of metastatic Renal-Cell carcinoma After Nonmyeloablative Allogenic Peripheral-Blood Stem-Cell Transplantation*, *NEJM*, Sept 14, 2000.

¹² Rodriguez-Galind, C, *Treatment of Metastatic Retinoblastoma*, *Ophthalmology*, June 2003.

¹³ Dunkel, IJ, *Successful Treatment of Metastatic Retinoblastom*, *Cancer*, Nov. 2000.

¹⁴ Hertzberg, H, *Recurrent Disseminated Retinoblastoma in a 7-year-old-girl Treated Successfully by High-Dose Chemotherapy and CD34-Selected Autologous Peripheral Blood Stem Cell Transplantation*, *Bone Marrow Transplant*, March 2001.

Sixty-five patients were treated with chemotherapy and stem cells from blood circulating in the body (peripheral blood stem cells) or from their own bone marrow stem cells. Thirty-seven of the patients (more than 57%) remained disease-free compared with only 24% survival of patients treated with traditional chemotherapy. Three more of the stem cell patients remained disease-free following additional surgery.¹⁵

Burns

A patient with skin burns covering over 70% of his body was treated with the transplantation of stem cells (known as mesenchymal stem cells). Wounds healed faster and new blood vessels were formed. As a result, additional burn treatment was started earlier and the patient was able to heal and rehabilitate much sooner.¹⁶

Ten patients with chemical eye burns were treated with stem cells taken from the eye. After two weeks, every patient experienced complete tissue growth and improved vision without any complications.¹⁷

Cardiovascular Disease

Eighteen patients with chronic (5 months to 8.5 years) myocardial infarctions were treated with intracoronary transplantation of their own bone marrow stem cells. The results were compared with a control group that did not receive stem cell therapy. Three months later, there was significant improvement in the group that received the stem cells: infarct size had reduced by 30% and left ventricular function improved by 15%.¹⁸

¹⁵ Bhatia, S., *High-Dose Chemotherapy as Initial Salvage Chemotherapy in Patients with Relapsed Testicular Cancer*, *Journal of Clinical Oncology*, Oct. 2000

¹⁶ . Ivekovic R, *Limbal Graft and/or Amniotic Membrane Transplantation in the Treatment of Ocular Burns*, *Ophthalmologica* Sept-Oct 2005.

¹⁷ Rasulov MF, *First Experience of the Use Bone marrow Mesenchymal Stem Cells of the Treatment of a Patient With Deep Skin Burns*, *Bull Exp Biol Med*, Jan 2005.

¹⁸ Strauer, Bodo E. MD, *Regeneration of Human Infarcted Heart Muscle by Intracoronary Autologous Bone Marrow Cell Transplantation in Chronic Coronary Artery Disease*, *Journal of American College of Cardiology*, November 2005.

Metabolic Disorders

Metachromatic Leukodystrophy

Six patients with metachromatic leukodystrophy (a neurological disease characterized by progressive deterioration of mental and motor function) were treated with bone marrow-derived stem cells. Four patients experienced significantly improved nerve conduction while bone density was maintained or improved in all of the patients.¹⁹

Muscular Dystrophy

An 11-year-old boy with Duchenne muscular dystrophy (DMD) was treated with umbilical cord blood stem cells. Over the process of several weeks, he experienced obvious improvement in his motor function – including an enhanced ability to walk, turn over, and stand up.²⁰

A 12-year-old boy with DMD who was unable to walk for 3 years was treated with umbilical cord blood stem cells. After 60 days, the genetic defect was corrected and fifteen days later, a biopsy of calf muscle revealed cellular and muscular development. At 100 days, there were significant improvements in the motor function of the boy's arms and legs.²¹

Disclaimer: To our knowledge, this information is accurate as of the date of writing. However, these summaries significantly simplify the findings in the original studies. Like any overview of a complex topic, oversimplifications are inevitable. This document attempts to provide the most accurate information in easily understandable terms.

¹⁹ Koc ON, Allogenic Mesenchymal Stem Cell Infusion for treatment of Metachromatic Leukodystrophy and Hurler Syndrome, Bone Marrow Transplant, Aug 2002.

²⁰ Zhang C, Allogenic Umbilical Cord Blood Stem Cell Transplantation in Duchenne Muscular Dystrophy, Zhonghua Yi Xue Za Zhi, March 2005.

²¹ Zhang C, Allogenic Therapy of Duchenne Muscular Dystrophy with Umbilical Cord Blood Stem Cell Transplantation, Zhonghua Yi Xue Za Zhi, Aug 2005.