

Treasures Right From Your Own Blood

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Abstract

The human body is an amazing design with the blood carrying stem cells and growth factors ready to heal and regenerate every tissue and every organ. The science of autologous adult stem cells from blood is emerging as the fore-runner among the various sources of adult stem cells because peripheral blood is such an easy access without the use of any invasive procedure as in the cases of bone marrow extraction or liposuction. There is also no risk of rejection or tumour formation compared to embryonic stem cells, and it certainly avoids all the ethical concerns. Blood-derived adult stem cells are multipotent and have demonstrated to be a valuable therapy for many diseases and conditions such as osteoarthritis, nerve damage, non-healing wounds, heart disease, diabetes, autoimmune diseases. It is also an excellent therapy for people who are seeking rejuvenation and anti-aging treatments. A simple blood draw harnessing the treasures right from your own blood and retransplanting them to you either intravenously or locally may very well be the answer that you are waiting for.

Introduction

Imagine that you have what it takes inside your own body to heal and regenerate your tissues and even organs without drugs and without invasive surgeries. How marvellous it would be. The human body does possess such an endogenous system through stem cells to accomplish these tasks. No wonder stem cells have commanded much attention among both researchers and patients seeking help as more and more research and clinical cases are proving that stem cells are by far the most promising and exciting hope for a cure in many diseases currently believed to be untreatable.

Stem cells were first studied by Becker *et al.* (1963). Later on, it was discovered that these cells are capable of infinite self-renewal, a central characteristic of stem cells. Thus, stem cells by definition have two essential properties, i.e. the capacity to reproduce indefinitely, giving

rise to more stem cells, and the capacity to differentiate into different cell types under appropriate conditions. They can develop into specialized tissues, such as heart tissues, bone, cartilage, nerve cells, skin, fat, muscles, etc., when these need repair or replacement. However, with disease and aging processes, the release of stem cells can be diminished and the amount needed to have a rapid and complete healing can be compromised. Therefore, intervention is necessary. Broadly speaking, there are two main types of stem cells: embryonic and non-embryonic stem cells, also known as adult stem cells.

Embryonic stem cells derive stem cells from embryos and adult stem cells from that of adult tissues. The use of embryonic stem cells in all areas of biomedical research has generated much controversy surrounding the sources from which these cells are obtained. Apart from the morality issue, in clinical use the concern remains that these stem cells might continue to divide out of control, leading to tumour formation (Lee and Hui, 2006). Safety concerns for the recipients of embryonic stem cells include possible rejection and cancer. Adult stem cells on the other hand are much safer and there are no indications of tumour formation over the last 40 years in the therapy of leukemia and lymphoma, which involve the use of adult stem cells. In fact, the majority of successful clinical applications of stem cells are all based on adult stem cells.

Adult Stem Cells

Adult stem cells, also referred to as mesenchymal stem cells (MSC), are multipotent and are easily isolated, easily cultured, and readily expanded in the laboratory setting. It is necessary to point out that the power of adult stem cells is not nebulously potential, but tangible and real as they have already produced many wonderful results in clinical cases. With adult stem cells, physicians have successfully treated autoimmune diseases such as lupus, multiple sclerosis, Crohn's disease and rheumatoid arthritis (Wulffraat *et al.*, 2001, Fagan, 2003). Furthermore, adult stem cells have helped to avert corneal degeneration

and to restore vision in cases of blindness (Tsai, 2000). They have also restored proper cardiac function to heart attack sufferers (Perin, 2003) and improved movement in patients with spinal cord injuries (Zwillich, 2004).

Adult stem cells are found in many of our own tissues and organs including bone marrow, fat tissue, peripheral blood and umbilical cord tissue. The bone marrow, however, appears to serve as the major reservoir of stem cells. But bone marrow extraction is an invasive procedure which can result in significant pain (Tholpady *et al.*, 2006). Adipose tissue, being in abundant quantity and easy access, has become an alternative source. However, adipose tissue is known to vary in metabolic activity and in its growing capacity, depending on the location of the tissue depot and the age and gender of the patient (Tholpady *et al.*, 2006). Similarly, liposuctions can be invasive. Complications such as fibrosis, necrosis, skin unevenness and brown discoloration may occur. Blood-derived adult stem cells are by far the safest and most accessible source, and have been documented to display stem cell properties (Porat *et al.*, 2006).

Clinical Application

A U.S. cardiologist, Dr. Zannos Grekos, among many other physicians, has demonstrated successful treatment of end-stage cardiac diseases using stem cells extracted from patients' own blood (www.regenocyte.com). Dr. Grekos offered cardiac nuclear scans, PET scans, and echocardiographs performed at six months and one year post-treatment, which confirm the regeneration of damaged heart tissue, the existence of new blood vessels and a dramatic improvement in heart function with autologous stem cells from blood. Besides breakthroughs in heart disease with autologous stem cells from blood, there are also therapeutic cases in many other conditions using blood-derived adult stem cells. Some examples are Type I diabetes (Eduardo *et al.*, 2009), arthritis (Chen *et al.*, 2008), renal failure (Brodie *et al.*, 2005), and autism (Ichim *et al.*, 2007).

At my clinic, autologous blood-derived adult stem cells have become a cutting edge treatment which is perfectly in line with the naturopathic philosophy of self-healing. Cellular therapy has long been a tradition in naturopathic practice using natural substances such as animal glandular tissues, homeopathic cellular preparations and frozen animal stem cells. Many naturopathic physicians are certified and experienced in blood treatments such as autohemotherapy, which involves mixing ozone gas with extracted blood followed by reinfusion, auto-vaccination and photo-oxidation (i.e. treating venous blood with UV light). Extracting stem cells and activating growth factors from platelets for self therapy will be a logical progression as modern medicine advances. Nothing will be more natural than using your own cells to heal your own body.

The stem cells are administered in two ways: intravenously and locally into the diseased tissues. Through an

I.V. drip, infused MSCs would be preferentially attracted to migrate into sites of inflammation or injury (Sackstein *et al.*, 2008). These freshly released stem cells will respond to the body signals and will find their ways to where they are needed! This inner body wisdom called 'homing' is ideal for those who desire minimally invasive therapies to promote healing and regeneration. I.V. infusion of stem cells offers a 'tune up' of the entire machinery since many diseases are of a systemic nature (e.g. aches and pains of multiple joints, and normal aging). However, more invasive procedures such as intra-arterial (via artery that feeds into the organ), intra-cardiac (in heart diseases) injections may be necessary to consolidate the stem cells to target a sick organ (Walczak *et al.*, 2008). Another approach to enhance the engraftment of MSC to a target organ is to differentiate the stem cells in the cell culture before transplanting.

Another fascinating behaviour of MSC is its ability to become identical to the surrounding tissue in its new found environment (Bartmann *et al.*, 2007). For example, when MSC is implanted into a degenerated joint, it will grow new cartilage, and if it is injected into the skin, it will turn into skin cells. But the details of the effectiveness and efficiencies of MSC engraftment in a target organ are still under investigation. The medical reviews have been very impressive (Karp *et al.*, 2009). Another way stem cells repair tissues is to secrete a wide spectrum of immune regulatory and hormone-like agents that greatly contribute to the trophic effect in regeneration (Caplan, 2007).

Many clinical benefits have been observed in my clinic for patients who receive local stem cell transplants. Direct MSC injection at the mastoid area has improved facial muscles movement and less droopy appearance in a young man who suffers from facial nerve damage. The therapy has also improved stress incontinence of urinary bladder in a number of women. One patient who took medication no longer needs to take it regularly as the bladder control is more normalized. Many who suffer from joint diseases report better joint mobility and muscle strength. Gum tissues become healthier and less atrophied. Some excellent results are also obtained in facial rejuvenation with MSC in restoring volume, skin texture and elasticity.

Platelet Rich Plasma

Another treasure that comes from the blood is platelets. Platelets are well known for their role in blood clotting. They are produced in large numbers from their parent cell, the megakaryocyte, which matures in the bone marrow. Despite its tiny size (1 – 3 µm), having no nucleus and living a short life span of only 7 to 10 days, platelets are packed with a large number of storage organelles. Each platelet resembles a large manufacturing plant that produces growth factors, chemokines, cytokines, proteins and neurotransmitters.

In our clinic, we extract venous blood to obtain platelets which are such an easily accessible reservoir of growth

factors and bioactive protein. After the blood is separated by centrifugation, the platelets will be activated to release their storage into the plasma. This activated platelet rich product will then be reinjected into the problematic area by itself or in conjunction with the stem cells because the two are complimentary.

Despite all the research and documented clinical cases for many years, stem cell transplanting is still considered to be experimental. But your own stem cells from blood should stand out at the forefront for people who desire the most advanced, safe, effective and affordable therapy. If we liken the human body to an automobile, the stem cell therapy would be an overhaul of the engine, whereas the platelet rich therapy would be an oil change. If our vehicle needs regular servicing, our body certainly demands at least the same care!

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