When the Price of Our Health is a Persons Death

The Stem Cell / Abortion Connection

by Dr. Brian W. Donnelly

I believe in stem cell research. As a man of science, I believe this line of investigation can lead us toward many important advances. As someone who believes that science needs to be kept within certain ethical boundaries, I know using embryonic stem cells is morally wrong. I know the same arguments being used in support of research involving the destruction of human embryos can be (and are being) used to further legitimize and protect abortion procedures. The public is all too unaware of this connection. Before I go on, let me give you a brief lesson in stem cell research and the promise it contains for serving man's medical needs.

Stem Cell Research 101

Stem cells are unspecialized cells in the body that are capable of becoming specialized cells, each with cell functions suited for a particular role in the body. When planted in the right location under the right circumstances, these undifferentiated stem cells can morph into mature, differentiated, normally, functioning cells. For example, the bone marrow stem cell is unspecialized, but is able to be transformed into a specific blood type, such as red blood cell or a white blood cell. When the body needs a certain type of blood cell, specific signals are sent to bone marrow stem cells and they are "turned on" to begin the specialization process. Stem cell research, in brief, involves gathering the right stem cells and planting them in the best environment to cause them to differentiate into normally functioning cells. Stem cells can be characterized as pluripotent (or titipotent), which means they can give rise to any kind of cell, or multipotent, which means they are already somewhat specialized and can give rise only to a limited number of cell types. It is commonly held that adult stem cells, such as bone marrow stem cells, are multipotent, while embryonic stem cells are pluripotent. But this is currently being challenged.

Sources of Stem Cells

The debate over the ethical use of stem cells for research boils down to where the stem cells come from. Embryonic stem cells are derived from the inner cell mass of the blastocyst, a very early stage in human development. After the fertilized egg cleaves, or splits, a zygote is formed. Further splitting results in the blastocyst. The inner cell mass of the 5 to 6-day-old blastocyst has proven to be a reliable source for pluripotent embryonic stem cells. However, in the process of harvesting the cells, a human embryo is destroyed. Its growth process – and its life – are brought to an end.

Adult stem cells on the other hand, can be derived from several sources without endangering a human life. In addition to the aforementioned bone marrow stem cells, adult stem cell sources include circulating blood, the intestinal tract, and the dermis, or lower layer of skin. The most intriguing source that I have read about is the adipocyte. Most people are familiar with another term for it – the fat cell. (When I peruse the dessert menu, I convince myself that my indulgence will someday advance the cause of science.) In addition, adult – or in this particular case, fetal – stem cells can be derived from umbilical cord blood, the placenta, and amniotic fluid. All of these sources are present in abundance and represent a veritable gold mine of stem cell research opportunities.

A Proven Record

Adult stem cells already have a proven track record in actual medical treatment. In the summer of 2006, for example, a 58 year old mother of two suffered her fourth heart attack. Diagnostic tests showed that the right side of her heart was functioning at less than 50 percent capacity. She was put on the heart transplant list. Despite state-of-the-art medical care, her heart continued to fail. With the help of a nurse who had taken care of her after her third heart attack, she was entered into a study. Bone marrow was removed from her own body, and its stem cells were cultivated and injected back into the right side of her heart. The results were nothing short of miraculous. Follow up testing revealed normal functioning of her right heart. Similar efforts to repair or replace heart valve tissue have likewise been successful. These triumphs have obviated the need for these patients to undergo heart transplants.

In cases of advanced liver cancer, sometimes the removal of all cancerous liver tissue would leave too little of the liver (less than 25 percent) to support life. Researchers have removed stem cells from patients own bone marrow, primed them to function as liver cells, then injected them back into the patients. The recovering livers treated with

the specialized cells grew at a rate double what had been observed in untreated patients. Similar results have been reported in patients with chronic liver failure, where the body was unable to regenerate enough liver cells to maintain life without the help of adult stem cells. In other research, stem cells derived from umbilical cord blood cells have been manipulated to manufacture insulin. Properly harnessed, this could revolutionalize the treatment of diabetes mellitus, which has become a huge national public health problem (1).

Adult stem cells have been shown to help patients with a wide variety of other illness, including breast cancer, ovarian cancer, multiple myeloma, neuroblastoma, renal cell (kidney) cancer, certain brain cancers, and some types of leukemias and lymphomas. Blood disorders such as sickle cell anemia, aplastic anemia, red cell aplasia, and thalassemia have been made more tolerable with adult stem cell treatments. Some types of auto-immune disorders are also on this list, including systemic lupus erythematosus, myasthenia gravis, rheumatoid arthritis, multiple sclerosis, Chrohn's disease, and alopecia universalis (total hair loss).

Spinal cord injury is one of the most promising avenues for stem cell treatments. Injecting the spinal fluid with these progenitor cells can restore function that was lost due to trauma. Similarly, these cells have been shown to speed healing, greatly facilitate regrowth of bone, and reverse tissue damage caused by gangrene. Such treatments, when fully developed, will bring about phenomenal advances in medicine. The scope of these therapeutic advances seems limited only by our imagination. Of course, a significant amount of diligent experimentation must be carried out before stem cell treatments become commonplace.

Why Embryonic Stem Cells?

While adult stem cells have been used to help patients scores of times, so far embryonic stem cells have had no actual success in treating patients. The very fact that they are so unspecialized poses its own set of problems when it comes to research – they are difficult to control. Sometimes they grow beyond the bounds in which they were placed, a benign overgrowth called neoplasia. Another problem with these cells is that their function can exceed the intended boundaries as well. In human physiology, too much function, as in the overproduction of proteins or hormones, can be disastrous. Put in non-medical terms, a little may be good, but a lot can be really bad.

An organization called Do No Harm has compiled a detailed listing of diseases for which adult stem cell treatments have shown benefits for human beings. At www.stemcellresearch.org, the organization keeps score between successful treatments using adult stem cells and those using embryonic stem cells. At the time of publication, the score was 73 to 0, with adult stem cells in the lead. The significant obstacles involved in embryonic stem cell research and the lopsided tally provided by Do No Harm beg the questions: Why would anyone continue to hold out hope that research with embryonic stem cells will benefit humans? Are the die-hards merely religious fanatics, committed to a particular ideology? Or do they know something we don't? One main argument in favor of continuing to pursue embryonic stem cell research is that further work in this area will likely develop experimental techniques that will facilitate stem cell research of any kind. This argument, however, presumes that the end (great scientific advances) justifies the means (destruction of human life). Which brings us to a closely related topic, not often acknowledged by the press that involves stem cells and another procedure that takes human life – abortion.

The Abortion Connection

The theory that embryonic stem cells could deliver a successful treatment for some disease already serves to validate, in some minds, the destruction of human life at its earliest stages. But what most people don't realize is that similar research on stem cells and regenerative tissues obtained from fetuses could also serve to further validate abortion procedures in the public mind. The reasoning is that if abortion can supply us with pluripotent stem cells or other similar regenerative tissues, it is a procedure worth protecting. By extension, those who try to protect the unborn – whether at the embryonic or fetal stage – would be, in effect, endangering the lives of those who suffer from the diseases that such cells and tissues can treat. Given the approval of abortion by so many in the American medical community and media, this rationale, once accepted, will be enduring. In fact, after the second veto of the partial-birth-abortion ban, there were reports that this procedure directly provided the means for fetal stem cell research.

To review the history, the procedure known as partial-birth abortion was banned by Congress twice in the 1990's, but the ban was twice vetoed by then-President Bill Clinton. A subsequent ban that President George W. Bush signed into law was challenged in the judicial system. The Supreme Court, in *Stenberg v. Carhart* (2000) ruled that the ban was unconstitutional because it could have been construed to apply to other abortion procedures.

Congress followed this with a new ban that was more specific to partial-birth abortion. This, too, was challenged judicially. A differently configured Supreme Court, in *Gonzalez v. Carhart* (2007), found this more tightly worded ban to be constitutionally acceptable. Testimony from the American Medical Association confirmed that there was no medical justification for partial-birth abortion – no known circumstance where it was the safest procedure that could be employed. In fact, it was disturbingly risky to the experts who testified before Congress.

Why, then, would the abortionist take the extra risk? For more money than usual, perhaps? And maybe a mother would agree to undergo a more dangerous procedure if the fees were waived, or, even better, if she were paid for something precious she could give the abortionist. The details of the partial-birth procedure offer some insight into what could be so sought-after by researchers. In partial birth abortion, the baby is positioned so that the feet can be delivered first (as opposed to a normal delivery, in which the head is delivered first). The rest of the body is then pulled out until only the head remains inside the womb. At that point, the abortionist uses scissors to open the skull, then suctions out the brain tissue, causing the skull to collapse.

This procedure thus affords direct access to fresh fetal brain tissue. In this type of research, it is often true that the fresher the tissue, the better the results. Brain and nervous system tissue in adults are generally thought to be unable to regenerate. If this were accomplished, the breakthrough would be huge. Such mercenary behavior is not unheard of. According to a recent *New England Journal of Medicine* article, such fetal stem cell research is already occurring in other countries. Again, the potential for a scientific (not to mention financial) breakthrough is real. Right now, a president's veto is the only thing that is keeping such activity from being licit in the United States.

A Race Against Time

The good news is that there may well be a bright light at the end of the research tunnel (see update below). Recent reports challenge the concept that adult stem cells are not, and cannot, be pluripotent. Such progress points the way to pursuing the aggressive manipulation of adult stem cells, and to the abandonment of the scientifically and ethically riskier use of human embryonic stem cells derived from aborted fetuses. The last word here belongs to Pope Benedict XVI. On October 11, 2007, the pope addressed Francis Kim Ji-young, the new ambassador of the Republic of Korea to the Holy See (2). He noted how Korea "has achieved notable successes in scientific research and development," especially in biotechnology that has "the potential to treat and cure illnesses so as to improve the quality of life in your homeland and abroad." However, he added, "discoveries in this field invite man into a deeper awareness of the weighty responsibilities involved in their application," and "under no circumstances may a human being be manipulated or treated as a mere instrument for experimentation." He continued:

> The destruction of human embryos, whether to acquire stem cells or for any other purpose, contradicts the purported intent of researchers, legislators and public health officials to promote human welfare. The Church does not hesitate to approve and encourage somatic stem-cell research: not only because of the favorable results obtained through these alternative methods, but more importantly because they harmonize with the aforementioned intent by respecting the life of the human being at every stage of his or her existence.

Research Update

Recently published research, which made news as this article was going to press, has revealed that two different groups of scientists have succeeded in converting ordinary human skin cells into cells that have the properties of embryonic stem cells. They achieved this result using a "direct reprogramming" technique that obviates the need to use embryonic stem cells. Expect more investigation to follow down this ethically acceptable path.

An article released in the *Journal of the American Medical Association* in April 2007 described the results of an experiment involving patients with the new onset of Type 1 diabetes mellitus, which results when the body, for unknown reasons, produces antibodies against the cells in the pancreas that produce insulin, the hormone that helps the body metabolize sugars and fats. These patients had their own blood drawn, which was treated to remove the stem cells that had originated in their bone marrow. The patients then received medication that suppressed their immune system and were injected with their own treated stem cells. Fourteen of the fifteen patients demonstrated significantly improved insulin production, even to the point of not needing any supplemental insulin injections. Is this a cure for diabetes mellitus? Not quite, but adult stem cell research is tantalizingly close to achieving that goal.

Although he was later charged with scientific fraud, in 2005 South Korean veterinarian Hwang Woo-suk announced that he had successfully derived embryonic stem cell lines from cloned human embryos.

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