Selling Stem Cell Hype

The parents of a two-year-old girl who has been blind since birth raised nearly $50,000 to take her to a clinic in China, where she received stem cells from donated umbilical cords. After the treatment, the parents were convinced that her sight had improved, but objective examination by an ophthalmologist revealed that she still had no vision. It’s a sad story that is one of many similar stories—the result of premature hype surrounding a relatively new technology.

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Actually, stem cell therapies have been around for years, but only for very limited applications such as treating certain blood cancers. The debate surrounding the ethics of using embryonic stem cells, however, has highlighted the great potential of therapies based on stem cells.

Stem cells are undifferentiated cells that have the potential to turn into specific cell types. Embryonic stem cells are the most potent because they can theoretically turn into any cell type in the body. The hope of research into stem cells is that we can learn how to control the process of differentiation so that stem cells can be used therapeutically.

Potential applications that are already being researched include injection of stem cells into failing hearts—cells that will then turn into heart muscle cells and start beating along with the rest, strengthening the heart. While still experimental, this is likely to be an early application of this kind of use of stem cells. Similar experiments are underway using stem cells to repair damaged brains or spinal cords.

Stem cells might also be used not as replacement cells but as support cells. Genetically engineered stem cells can essentially become drug delivery systems or support cells that allow diseased cells to survive longer and function better.

But many hurdles remain, the biggest of which is keeping stem cells from becoming cancer cells. There is a reason our bodies are not already infused with stem cells that have unlimited regenerative ability (our bodies do have natural stem cells, but they are in specific numbers and locations). Stem cells share some characteristics with cancer cells, and injected stem cells are as likely to become cancers as replacements for diseased or injured cells.

Getting stem cells to do what we want them to, and getting them to survive long enough to do it, is also no trivial matter. Stem cells have tremendous potential, and they will likely be playing an increasing role in medical therapies over the next twenty years. But reality has yet to catch up with the hype.

The situation is ripe for exploitation. Stem cell clinics have been set up, mostly in poorly regulated countries such as China, India, and several countries in South America. They exist to lure in wealthy (by international standards) Westerners desperate for a cure (such as the parents of young blind children). Fees range from the tens of thousands to even hundreds of thousands of dollars, including the costs of travel. Most victims are not wealthy people who simply write a check but instead members of middle-class families who need to raise money for the treatments.

Once they have invested so much time, effort, and emotion and so many resources in the stem cell treatment—which often includes taking money from family, friends, and coworkers—these families have a huge investment in believing the treatment has worked, even when all objective evidence says otherwise. Often there is a temporary placebo effect from getting the treatment—or perhaps a temporary effect from the anesthesia or other aspects of the treatment—but no real improvement. But any fluctuation in symptoms...
is often interpreted as a sign the treatment has worked, which sometimes motivates the patients and their families to raise more money for more stem cell treatments.

The clinics themselves are not producing useful scientific data but are instead simply publicizing anecdotes of their success. There is often little transparency in what they are doing and no way of knowing what they are even injecting into their patients.

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What little objective investigation we have into these stem cell clinic treatments reveals that patients are either unchanged or even harmed by the therapies. Ophthalmologist Shakesh Kaushal, of the University of Massachusetts, examined eight children treated with stem cells for blindness. “There didn’t seem to be any ostensible benefit from the stem-cell infusion,” he is quoted as saying in an NPR report, “in all of them, as far as we could tell” (Knox 2010).

Dobkin et al. (2006) reviewed the cases of seven patients who received stem cell injections for spinal cord injury. They conclude, “No clinically useful sensorimotor, disability, or autonomic improvements were found.” In other words, there was no benefit. There were, however, complications, including meningitis in five of the seven patients.

The media, for their part, mostly promote these fraudulent stem cell clinics. They often report stories of “miracle cures” in gushing terms, without the slightest amount of skepticism. These reports are little more than free advertisements for these clinics, driving more desperate patients through their doors.

Hope is a very positive emotion; it can keep us going in hard times, and it motivates all the hard work and investment it takes to develop high-tech treatments such as stem cell therapy. But there is a dark side to hope: false hope, promoted by premature uncritical hype. Unjustified hype also undermines legitimate therapies and scientific research as the public becomes disillusioned. While it is legitimate to discuss the great potential of stem cell therapies, such discussions must include the proper context. Stem cell therapies remain largely experimental, and there is no telling when or even if they will pan out.

The media need to take greater responsibility in relating these stories to the public. Medical professionals need to pay attention to what is happening, and they also need to get involved in properly informing the public. Governments need to pay close attention to how such clinics are regulated. And the public needs to approach claims of stem cell “miracles” with extreme skepticism and get advice from professionals before investing emotion and large amounts of resources into what is likely to be all hype and no hope.

References