Fetal Stem Cells and Parkinson Disease?promises never to be kept?

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When fetal stem cells are publicly discussed, three diseases?often represented by their celebrity spokespersons?lead a list of potential therapeutic applications. They are Parkinson Disease (Michael J Fox), paralysis as a result of spinal cord injury (previously the late Christopher Reeve), and Diabetes Mellitus, type 1, (either Mary Tyler Moore or Ron Santo). The media packages the information as foregone conclusions: fetal stem cells are a veritable source of untapped, and then implied, ?unlimited? therapeutic uses. A stunning recent series of setbacks in the context of fetal stem cells and Parkinson Disease (PD), however, has not received equivalent publicity. It appears that the promise of this controversial, and as of yet unproven, therapeutic modality for an estimated one million persons with PD, has been scientifically exposed and found wanting.

The journal *Nature Medicine* published three articles in May 2008 analyzing eight patients from three separate cohorts who received human fetal midbrain tissue transplants 9-16 years earlier for PD. The published results led to two insightful editorial commentaries. The studies have dispelled the myth that fetal stem cells are a straightforward panacea for PD. In addition, they propose a plausible theory that these cells, even with continued research, may never work in this regard.

In two of the studies, the transplanted patients developed Lewy bodies within their grafts (or alpha-synuclein) which in fact are the pathological finding in many generic instances of PD. It appears that any benefits accrued from the transplanted tissue are temporary (just as with
medical therapy) and the same pathology that drives the progression of PD affects the graft in a similar manner. In another study, the dopaminergic neurons transplanted to cure the underlying PD pathology were actually a hybrid also containing serotonin neurons which should not have been included. The conclusions drawn from these findings were that the transplantation of dopamine neurons into human beings has not yet been optimized. Although the observation appears to leave a door open to ongoing refinements, there was more. The commentators opined that the graft pathology demonstrated in these studies contains a strong attack on the premise that cell transplantation is a suitable approach to Parkinson disease. They argue further that the data strengthens a view that cell therapies in PD are not likely to work.

From a scientific perspective, it appears that the use of fetal stem cells is akin to treating a symptom, but not the real disease of PD. The damage to the dopamine neurons in the midbrain of those suffering with PD is manifest only after widespread damage is already present in other sections of the brain! PD has undergone a true Kuhnian paradigm shift, as has Amyotrophic Lateral Sclerosis (Lou Gehrig’s disease or ALS). If the damage to these previously ignored brain regions is not addressed, stem cells will become an invasive, and merely temporary, respite for PD. Furthermore, another earlier study also proved that therapy with stem cells can actually lead to greater brain morbidity and even death.

From an ethical perspective, a veritable cornucopia has been opened. How is fetal cell therapy ethically suspect? Well, let’s count the additional ways! Not only has the critical issue of personhood in the donor not been addressed adequately, but now, the May studies have exposed fetal stem cell therapy for PD for what it really is—a potentially dangerous therapy that is not curative, not standardized, and occasionally fatal. How can informed consent be obtained if all these other substantive ethical issues continue to be ignored? As an aside, one study above, was also an example of stem cell transplant tourism. The patient and family had no recourse if there were legal concerns after his death because the transplant team resided in another country.

It is time to place a moratorium on fetal stem cells for the treatment of PD. Not only has the donor’s personhood been assaulted, but furthermore, scientific data has also questioned safety and efficacy not only in the present, but well into the future.

References


4 Ibid.


6 Ibid.

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