Transplanted neurons develop disease-like pathology in Huntington's patients

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The results of a recent study published in PNAS question the long-term effects of transplanted cells in the brains of patients suffering from Huntington's disease. This study, conducted jointly by Dr. Francesca Cicchetti of Université Laval in Quebec, Canada, Dr. Thomas B. Freeman of the University of South Florida, USA, and colleagues provides the first demonstration that transplanted cells fail to offer a long-term replacement for degenerating neurons in patients with Huntington's disease.

Huntington's disease is a neurodegenerative disease of genetic origin that targets a particular type of neuron. The loss of these neurons is responsible for the appearance of involuntary movements as well as cognitive and psychiatric impairments. Over a decade ago, Dr. Thomas Freeman of the University of South Florida initiated a clinical trial of neural cell transplantation in Huntington's diseased patients in an attempt to alleviate the dreadful symptoms that characterize this disease.

Some patients demonstrated some mild, transient clinical benefits that lasted for about 2 years. However, the loss of functional recovery after this indicated that graft survival and functionality may be jeopardized long- term.

This post-mortem study of 3 cases is the first demonstration that 1) graft survival is indeed attenuated long-term, 2) grafts undergo degeneration that resembles the pathology observed in Huntington's disease, and 3) the brain's inflammatory response could contribute to the compromised

survival of grafted cells. The authors also demonstrated that cortical neurons that develop Huntington's disease synapse on the grafts and may cause neurotoxicity to healthy cells, inducing grafted neuronal cell death.

Despite the excitement regarding cell transplantation therapy utilizing embryonic or stem cells, these results raise concerns for the therapeutic potential of transplantation as a treatment option for Huntington's disease. However, these observations suggest new potential mechanisms involved in the development of the disease. A more in-depth investigation could lead to the development of novel therapeutic strategies. The control of patient immune and inflammatory responses holds therapeutic potential, and Cicchetti et al. are continuing their research in that direction.

Source: Université Laval