Safety and Efficacy of Autologous Bone Marrow Mononuclear Cell (ABMMC) Transplantation in Parkinson Disease (PD) 1 Year Follow Up. The first clinical experience by Endovascular Therapy.

Tuma J. [1], Carrillo A. [1], Ercilla J. [1], Chirinos S. [1] ,Castillo J. [2], Carrasco A. [2] ,Rios H. [2], Onofre A. [3], Patel A.N. [4]

[1]Division of Interventional Cardiology and Regenerative Medicine, Clínica San Felipe, Clínica, Maisón de Santé, PERU, [2]Instituto de Criopreservación y Terapia Celular, PERU, [3]Resocentro, PERU. The University of Utah [4]

Background: PD is associated with a progressive loss of nigrostriatal dopamine neurons. Medication therapy provides adequate control of symptoms for several years, but long-term treatment is complicated by progressive disability and motor fluctuation. In animal models of PD, ABMMC have been shown to stimulate neurogenesis and improve motor function.

Methods: 33 patients were recruited from Aug 2006 to April 2007 with advanced PD and underwent ABMMC transplantation infused into the carotid artery. All were suitable for complete clinical evaluation after a median follow-up of 12 months, 15 of them were evaluated with (MRI) at basal and 1 year follow-up. After signed informed consent, a median volume of 400 ml was obtained from iliac aspiration. Median of mononuclear and CD34 infused were $14*10^8$ and $12.34*10^6$. Clinical evaluations included the Unified Parkinson's Disease Rating Scale (UPDRS) and Schwab-England (SE) activities of daily living. Multivoxel MRI striatum spectroscopy N-acetylaspartate (NAA)/creatine (Cr) were performed to study neuronal dysfunction and reversibility after ABMMC.

Results: Female/male ratio was 1/2, median age was 64 years old (range: 46-81), median years with PD was 7 years (range: 0.3-26 years), No complications related to transplantation were observed. After a median time of 1 week, patients improved clinically; a comparison between UPDRS and SE improved significantly. If we considerer the best NAA/Cr improvement, it showed statically significance. ($p<0.001$, 2-tailed t test, see table).

CLINICAL	n	basal	post ABMNC	t	p (2-tailed)
UPDRS Daily live	33	22.3	14.7	5.45	< 0,001
UPDRS Motor examination	33	25.3	15.4	5.28	< 0,001
Schwab and England	33	46%	67%	5.85	< 0,001

MRI

NAA/Cr best improvement	15	1.42	1.86	2.68	0.018
CFB best improvement	15	0.38	0.43	1.22	0.239
CFBr best improvement	15	0.95	1.04	1.63	0.124

Conclusions: ABMMC can be transplanted in patients with advanced PD safely. it is associated with significant rapid improvement in symptoms, consistent clinical benefit and striatum spectroscopy MRI improvement.

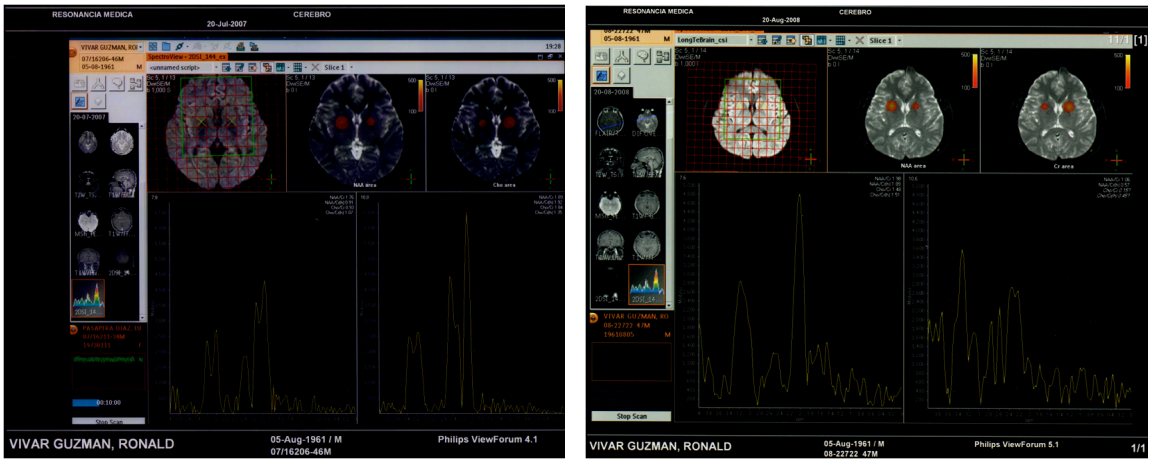

Figure 1. Spectroscopy and perfusion MRI assessment at basal (left panels) and after 1 year follow-up (right panels); showing improvement in a PD patient.