Annals of Clinical Case Reports

Clinical Image
Published: 16 Jun, 2022

Brain Perfusion SPECT in Patients with Alzheimer's Disease Treated with Recombining Human Erythropoietin with Low Content of Sialic Acid

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Keywords

Brain perfusion; SPECT; Alzheimer; NeuroEpo

Clinical Image

Brain perfusion SPECT (Single Photon Emission Computed Tomography) has been a very useful nuclear technique since a long time, in the follow-up the therapeutic response of several conditions and in this case for patients with Alzheimer's Disease (AD) [1,2].

Erythropoietin plays two roles. On the one hand, it performs an erythropoietic function (endocrine role) and by the other hand, a cytoprotective function (autocrine/paracrine role) [3,4].

Recombining Human Erythropoietin with low content of sialic acid (NeuroEpo), obtained through a biotechnological process, has therapeutic activity, and also is a growing line issue of research in Neurosciences [5].

NeuroEPO has neuroprotective properties through several mechanisms published: it maintains tissue oxygenation, reduces glutamate toxicity, induces the production of anti-apoptotic factors, reduces inflammation, decreases damage mediated by nitric acid, and also has a neurotrophic, antioxidant and angiogenic action [5-7].

The author presents the brain SPECT images performed on two patients with a clinical diagnosis of Alzheimer's disease. The studies were performed before and one year after treatment. The patients were previously evaluated by clinical exams and laboratory, neuropsychological and neurophysiological tests.

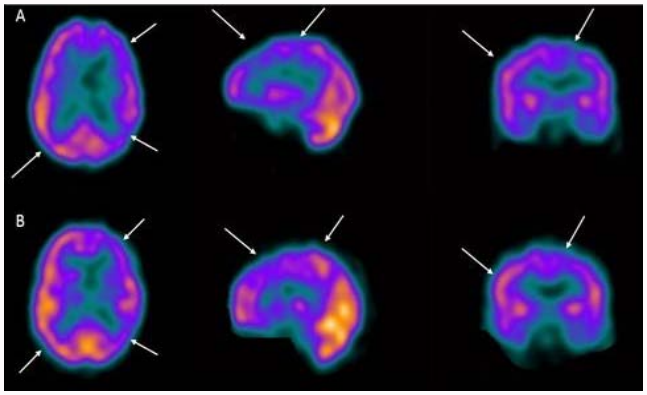

Figure 1: Brain perfusion SPECT (cross-sectional, sagittal and coronal sections) performed after intravenous administration of 1130 MBq of ^{99m}Tc-ECD. Study carried out on a 59-year-old male patient with disorientation in time and space, memory loss of 2 years of evolution and a clinical diagnosis of moderate Alzheimer's disease. Computed Axial Tomography reported moderate generalized cortical atrophy with ventricular asymmetry. A) Study before treatment shows bilateral posterior parietal-temporal hypoperfusion and in the frontal region, somewhat more intense in the left hemisphere. B) Study carried out one year after treatment with NeuroEpo (1 mg intranasal, three times a week) shows an increase in cerebral perfusion in previously affected regions. Arrows point to regions with changes in perfusion. Changes in cerebral perfusion coincided with a clinical improvement.

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Received Date: *30 May 2022*

Accepted Date: *07 Jun 2022*

Published Date: *16 Jun 2022*

Citation:

Quián YP, Batista Cuellar JF, Pérez SS, Ruiz LP. Brain Perfusion SPECT in Patients with Alzheimer's Disease Treated with Recombining Human Erythropoietin with Low Content of Sialic Acid. Ann Clin Case Rep. 2022; 7: 2231.

ISSN: 2474-1655

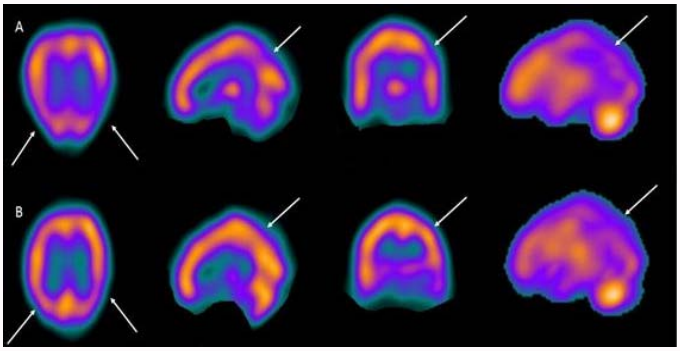

Figure 2: Brain perfusion SPECT (cross-sectional, sagittal, coronal and 3D views) performed after intravenous administration of 1107 MBq of ^{99m}TC-ECD. A 79-year-old male patient, moderate recent memory disorders, moderate disorientation in time and space, an evolution time of 8 years, and a clinical diagnosis of moderate Alzheimer's disease. Computed Axial Tomography did not report alterations. A) Study prior to treatment shows more intense bilateral posterior temporal-parietal hypoperfusion in the left hemisphere. B) Study one year after treatment (0.5 mg intranasal of NeuroEpo, three times a week) showing increased cerebral perfusion in previously affected regions. Arrows point to regions with changes in perfusion. The changes in perfusion were associated with slight clinical improvement.

NeuroEPO was administered intranasally at a dose of 1 mg. SPECT was performed after the administration of 740 MBq to 925 MBq of ^{99m}Tc-ECD (Ethylenecysteine dimer). Symmetric bilateral posterior temporal and parietal cortical hypoperfusion with posterior predominance was considered a typical pattern of AD.

In both patients, an increase in cerebral perfusion was observed, which was associated with an improvement in clinical manifestations.

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