PEMFS AND BRAIN RECOVERY AFTER STROKE

Source: https://www.drpawluk.com/pemf-studies/pemfs-and-brain-recovery-after-stroke/

The ability to recover after stroke depends on many factors, including the regenerative capabilities of the brain. Recovery depends on the plasticity of the brain. The plasticity, or neuroplasticity, required in a damaged brain is very different from the plasticity of a normal functioning brain. The demand for adaptive healing starts immediately after a stroke event where blood supply to the brain is stopped or limited. The availability of various factors in the brain, called neurotrophic or growth factors, affect the potential for the growth of new neurons and the survival of existing neurons. Neurogenesis is regulated by many factors including neurotrophins, growth factors, hormones, neurotransmitters, and micro-environmental factors.

A PEMF STUDY IS CONDUCTED

A study was done to evaluate the effect of extremely low-frequency electromagnetic field therapy (ELF-EMF) on brain plasticity in the rehabilitation of patients after stroke. Forty-eight patients were divided into two groups and had the same rehabilitation program, but in the ELF-EMF study group, the patients additionally were exposed to a standard series of 10 ELF-EMF treatments, for 15 mins, at 5 mT (50 G), 40 Hz, to the pelvis. Most of the people in the study were between 3 to 4 weeks after their stroke and had an average age between 45-48 years.

The level of neuroplasticity was measured by the blood level of brain-derived neurotrophic factor (BDNF), the vascular-endothelial growth factor (VEGF), as well as BDNF RNA gene expression. Additionally, they tested the levels of hepatocyte growth factor, stem cell factor, stromal cell-derived factor 1α, nerve growth factor β, and leukemia inhibitory factor.

RESULTS OF PEMF STUDY ON BRAIN RECOVERY AFTER STROKE

After 4 weeks, during which patients had undergone neurorehabilitation and neurological examinations, they assessed functional recovery using the Barthel Index, Mini-Mental State Examination (MMSE), Geriatric Depression Scale (GDS), National Institutes of Health Stroke Scale (NIHSS), and the modified Rankin Scale (mRS). ELF-EMF treatment significantly increased growth factors and cytokine levels involved in neuroplasticity, as well as promoted enhancement of functional recovery. These effects were attributed to an increase in mRNA gene expression. Increased BDNF blood levels were associated with better clinical measures, and with lower depression scores (GDS). The PEMF group had double the amount of BDNF and 2.5 times more gene expression. VEGF is involved in the improvement of damaged cells by increasing circulation and restoring function. VEGF levels increased by 50%. Stroke scale severity and function measures were about 65% and 50% worse, respectively, in the non-PEMF group. The PEMF group also had about 35% better cognitive functioning and 45% better depression scores.

This study is important in showing that significantly better clinical improvements in stroke rehabilitation and recovery are supported by physical changes in plasticity measures, with the use of relatively low intensity, short course treatments of PEMFs. In this study PEMFs were started within 3-4 weeks of the stroke. It appears to make sense that PEMFs should be commonly used to enhance the recovery of people with recent strokes.

Increase in Blood Levels of Growth Factors Involved in the Neuroplasticity Process by Using an Extremely Low Frequency Electromagnetic Field in Post-stroke Patients. Cichoń N, Bijak M, Czarny P, Miller E, et al. Front Aging Neurosci. 2018 Sep 26;10:294.