Int J Neurosci. 1994 Jun;76(3-4):185-225.

Alzheimer's disease: improvement of visual memory and visuoconstructive performance by treatment with picotesla range magnetic fields.

Sandyk R.

NeuroCommunication Research Laboratories, Danbury, CT 06811.

Impairments in visual memory and visuoconstructive functions commonly occur in patients with Alzheimer's disease (AD). Recently, I reported that external application of electromagnetic fields (EMF) of extremely low intensity (in the picotesla range) and of low frequency (in the range of 5Hz-8Hz) improved visual memory and visuoperceptive functions in patients with Parkinson's disease. Since a subgroup of Parkinsonian patients, specifically those with dementia, have coexisting pathological and clinical features of AD, I investigated in two AD patients the effects of these extremely weak EMF on visual memory and visuoconstructive performance. The Rey-Osterrieth Complex Figure Test as well as sequential drawings from memory of a house, a bicycle, and a man were employed to evaluate the effects of EMF on visual memory and visuoconstructive functions, respectively. In both patients treatment with EMF resulted in a dramatic improvement in visual memory and enhancement of visuoconstructive performance which was associated clinically with improvement in other cognitive functions such as short term memory, calculations, spatial orientation, judgement and reasoning as well as level of energy, social interactions, and mood. The report demonstrates, for the first time, that specific cognitive symptoms of AD are improved by treatment with EMF of a specific intensity and frequency. The rapid improvement in cognitive functions in response to EMF suggests that some of the mental deficits of AD are reversible being caused by a functional (i.e., synaptic transmission) rather than a structural (i.e., neuritic plaques) disruption of neuronal communication in the central nervous system.

Publication Types:

- Case Reports
- Review
- Review, Tutorial

PMID: 7960477 [PubMed - indexed for MEDLINE]

Int J Neurosci. 1991 Aug;59(4):259-62.

Age-related disruption of circadian rhythms: possible relationship to memory impairment and implications for therapy with magnetic fields.

Sandyk R, **Anninos PA**, **Tsagas N**.

Department of Psychiatry, Albert Einstein College of Medicine/Montefiore Medical Center, Bronx, NY 10461.

Disorganization of circadian rhythms, a hallmark of aging, may be related causally to the progressive deterioration of memory functions in senescence and possibly Alzheimer's disease (AD). In experimental animals, disruption of circadian rhythms produces retrograde amnesia by interfering with the circadian organization of memory processes. The circadian system is known to be synchronized to external 24 h periodicities of ambient light by a neural pathway extending from the retina to the suprachiasmatic nucleus (SCN) of the anterior hypothalamus. There is also evidence that the earth's magnetic field is a time cue ("Zeitgeber") of circadian organization and that shielding of the ambient magnetic field leads to disorganization of the circadian rhythms in humans. Since aging is associated with a delay of the circadian rhythm phase, and since light, which phase advances circadian rhythms, mimics the effects of magnetic fields on melatonin secretion, we postulate that application of magnetic fields might improve memory functions in the elderly as a result of resynchronization of the circadian rhythms. Moreover, since the circadian rhythm organization is more severely disrupted in patients with AD, it is possible that magnetic treatment might prove useful also in improving memory functions in these patients. If successful, application of magnetic fields might open new avenues in the management of memory disturbances in the elderly and possibly in AD.

Publication Types:

- Review
- Review, Tutorial

PMID: 1955287 [PubMed - indexed for MEDLINE]