Hydrocortisone responsiveness in Gulf War veterans with PTSD: Effects on ACTH, declarative memory hippocampal [(18)F]FDG uptake on PET.


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Abstract

Neuroendocrine, cognitive and hippocampal alterations have been described in Gulf War (GW) veterans, but their inter-relationships and significance for posttraumatic stress disorder (PTSD) have not been described. Hydrocortisone (Hcort) was administered to GW veterans with (PTSD+ n=12) and without (PTSD- n=8) chronic PTSD in a randomized, placebo-controlled, double-blind challenge. Changes in plasma ACTH, memory, and hippocampal [(18)F]FDG uptake on positron emission tomography were assessed. The low-dose dexamethasone suppression test was also administered. The PTSD+ group showed greater cortisol and ACTH suppression, reflecting greater peripheral glucocorticoid receptor (GR) responsiveness, and did not show an Hcort-induced decrement in delayed recall or retention. The groups had comparable relative regional hippocampal [(18)F]FDG uptake at baseline, but only the PTSD- group had an Hcort-associated decrease in hippocampal [(18)F]FDG uptake. Asymmetry in hippocampal hemispheric volumes differed between PTSD+ and PTSD- groups. This asymmetry was associated with cortisol, ACTH, retention and functional hippocampal asymmetry before, but not after, Hcort administration. Differences in brain metabolic responses between GW veterans with and without PTSD may reflect differences in peripheral and central GR responsiveness.

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Idiopathic environmental intolerances (IEI): from molecular epidemiology to molecular medicine.


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Abstract

Inherited or acquired impairment of xenobiotics metabolism is a postulated mechanism underlying environment-associated pathologies such as multiple chemical sensitivity, fibromyalgia, chronic fatigue syndrome, dental amalgam disease, and others, also collectively named idiopathic environmental intolerances (IEI). In view of the poor current knowledge of their etiology and pathogenesis, and the absence of recognised genetic and metabolic markers of the diseases.

They are often considered "medically unexplained syndromes". These disabling conditions share the features of polysymptomatic multi-organ syndromes, considered by part of the medical community to be aberrant responses triggered by exposure to low-dose organic and inorganic chemicals and metals, in concentrations far below average reference levels admitted for environmental toxicants.

A genetic predisposition to altered biotransformation of environmental chemicals, drugs, and metals, and of endogenous low-molecular weight metabolites, caused by polymorphisms of genes coding for xenobiotic metabolizing enzymes, their receptors and transcription factors appears to be involved in the susceptibility to these environment-associated pathologies, along with epigenetic factors.

Free radical/antioxidant homeostasis may also be heavily implicated, indirectly by affecting the regulation of xenobiotic metabolizing enzymes, and directly by causing increased levels of oxidative products, implicated in the chronic damage of cells and tissues, which is in part correlated with clinical symptoms.

More systematic studies of molecular epidemiology, toxico- and pharmacogenomics, elucidating the mechanisms of regulation, expression, induction, and activity of antioxidant/detoxifying enzymes, and the possible role of inflammatory mediators, promise a better understanding of this pathologically increased sensitivity to low-level chemical stimuli, and a solid basis for effective individualized antioxidant- and/or chelator-based treatments.

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Extremely Low-Frequency Magnetic Field Decreased Calcium, Zinc and Magnesium Levels in Costa of Rat.


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Abstract

Electromagnetic field (EMF) can affect cells due to biochemical change followed by a change in level of ions trafficking through membrane. We aimed to investigate possible changes in some elements in costa of rats exposed to long-term extremely low-frequency magnetic field (ELF-MF). Rats were exposed to 100 and 500 µT ELF-MF, which are the safety standards of public and occupational exposure for 2 h/day during 10 months. At the end of the exposure period, the samples of costa were taken from the rats exposed to ELF-MF and sham. The levels of elements were measured by using atomic absorption spectrophotometry (AAS) and ultraviolet (UV) spectrophotometry. Ca levels decreased in the ELF-500 exposure group in comparison to sham group (p □<□ 0.05). Statistically significant decrease was found in Mg levels in the ELF-500 exposure group in comparison to sham and ELF-100 exposure groups (p □<□ 0.05). Zn levels were found to be lower in the ELF-500 exposure group than those in the sham and ELF-100 exposure groups (p □<□ 0.05). No significant differences were determined between groups in terms of the levels of P, Cu and Fe. In conclusion, it can be maintained that long-term ELF-MF exposure can affect the chemical structure and metabolism of bone by changing the levels of some important elements such as Ca, Zn and Mg in rats.

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