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Effects of 900-MHz electromagnetic field emitted from cellular phone on brain oxidative stress and some vitamin levels of guinea pigs.

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This study was designed to demonstrate the effects of 900-MHz electromagnetic field (EMF) emitted from cellular phone on brain tissue and also blood malondialdehyde (MDA), glutathione (GSH), retinol (vitamin A), vitamin D(3) and tocopherol (vitamin E) levels, and catalase (CAT) enzyme activity of guinea pigs. Fourteen male guinea pigs, weighing 500-800 g were randomly divided into one of two experimental groups: control and treatment (EMF-exposed), each containing seven animals. Animals in treatment group were exposed to 890- to 915-MHz EMF (217-Hz pulse rate, 2-W maximum peak power, SAR 0.95 w/kg) of a cellular phone for 12 h/day (11-h 45-min stand-by and 15-min spiking mode) for 30 days. Control guinea pigs were housed in a separate room without exposing EMF of a cellular phone. Blood samples were collected through a cardiac puncture and brains were removed after decapitation for the biochemical analysis at the end of the 30 days of experimental period. **It was found that the MDA level increased (P<0.05), GSH level and CAT enzyme activity decreased (P<0.05), and vitamins A, E and D(3) levels did not change (P>0.05) in the brain tissues of EMF-exposed guinea pigs. In addition, MDA, vitamins A, D(3) and E levels, and CAT enzyme activity increased (P<0.05), and GSH level decreased (P<0.05) in the blood of EMF-exposed guinea pigs. It was concluded that electromagnetic field emitted from cellular phone might produce oxidative stress in brain tissue of guinea pigs.** However, more studies are needed to demonstrate whether these effects are harmful or/and affect the neural functions.

glutathione

Biochemistry. A tripeptide of [glycine](#), cystine, and [glutamic acid](#) that is widely distributed in [animal](#) and [plant tissues](#). It is involved in [oxidation-reduction](#) reactions, in the formation and maintenance of disulfide bonds in [proteins](#), in transport of [amino acids](#) across [cell membranes](#), and is a [cofactor](#) for some [enzymes](#). It exists in both the reduced thiol form (GSH) and the [oxidized](#) disulfide form (GSSG). In [erythrocytes](#), these reactions prevent [oxidative](#) damage, GSH is [oxidized](#) by H_2O_2 to [glutathione disulfide](#) (GSSG) [catalyzed](#) by [glutathione peroxidase](#).

malondialdehyde

Biochemistry. [Malondialdehyde](#) is a product of polyunsaturated [fatty acid](#) peroxidation and used as [marker](#) of [oxidative stress](#).

catalase

Enzymology. An oxidoreductase that [catalyzes](#) the conversion of [hydrogen peroxide](#) (H_2O_2) to water and [oxygen](#) to protect [cells](#). It is present in many [animal cells](#), especially in the peroxisomes of the [liver](#).