

Overview of the epidemiologic studies on the health effects of ELF magnetic and electric fields published in the fourth trimester of 2006

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1. Residential exposure

CONSULTATIONS IN PRIMARY CARE FOR SYMPTOMS ATTRIBUTED TO ELECTROMAGNETIC FIELDS - A SURVEY AMONG GENERAL PRACTITIONERS.

Huss A., Roosli M.

BMC Public Health 2006; 30 : 267.

Five percent of the Swiss population attribute symptoms to electromagnetic fields (EMF). General practitioners (GPs) might play a key role in recognising an emerging health risk, since they are the first to observe and follow up persons who attribute symptoms to EMF. It is unclear to what extent EMFs have become an issue in general practice and which experiences GPs report from the consultations.

The authors conducted telephone interviews in a random sample of GPs in Switzerland in order to assess the frequency of consultations in primary care due to EMF and the GPs' experience with these patients.

342 general practitioners were interviewed, corresponding to a response rate of 28.2%. 69% of the GPs reported at least one consultation due to EMF, but GPs with a certificate in complementary medicine were much more likely to report EMF consultations. The median of EMF consultation numbers within one year was three. An overview of the most recent EMF-related consultation per GP yielded sleep disorders, headaches and fatigue as the most often reported symptoms and mobile phone base stations, power lines and the own use of mobile phones as the main EMF sources suspected to be associated to symptoms. GPs judged the association between EMF and the symptoms to be plausible in 54% of the cases. There was no combination of symptoms and EMF sources that was remarkably and consistently judged to be a plausible cause of the symptoms.

In this survey, GPs often judged the association between the health problems and the suspected exposure to be plausible. This plausibility assessment seems to be based on grounds of preventive positions in a situation of scientific uncertainty. More research effort is needed to obtain more insight on a potential association between long term EMF exposure and unspecific symptoms.

ANALYSES OF MAGNETIC-FIELD PEAK-EXPOSURE SUMMARY MEASURES.

Mezei G., Bracken T.D., Senior R., Kavet R.

J Expo Sci Environ Epidemiol. 2006; 16 : 477-485.

Two previous epidemiologic studies reported an association between the maximum magnetic field exposure logged during a 24-h measurement period and risk of miscarriage. A hypothesis was put forth which argued that the observed association may be the result of behavioral differences between women with healthy pregnancies (less physically active) and women with miscarriage. The authors analyzed four existing data sets with power-frequency magnetic-field personal exposure (PE) measurements to investigate the characteristics of peak-exposure measures. The authors found that the value of the measured maximum magnetic-field exposure varied inversely with the sampling interval between magnetic-field measurements and

that maximum values demonstrated less stability over time in repeated measurements, compared to time-weighted average and 95th and 99th -percentile values. The authors also found that the number of activity categories entered by study subjects could be used to estimate the proportion of subjects with exposure above various threshold values. Exposure metrics based on maximum values exceeding thresholds tend to classify active people into higher exposure categories. These findings are consistent with the hypothesis suggesting that the association between maximum magnetic fields and miscarriage are possibly the result of behavioural differences between women with healthy pregnancies and women who experience miscarriages. Thus, generalization from a given study to more global exposure characterization should be made with particular caution and with due consideration to sampling interval and other characteristics of the measurement protocol potentially influencing the measured maximum. Future epidemiologic studies of peak magnetic field exposure and spontaneous abortion should carefully evaluate the potential confounding effect of the women's activity level during pregnancy.

AUTOMATED EXTERNAL DEFIBRILLATORS DO NOT RECOMMEND FALSE POSITIVE SHOCKS UNDER THE INFLUENCE OF ELECTROMAGNETIC FIELDS PRESENT AT PUBLIC LOCATIONS.

Fleischhackl R., Singer F., Roessler B., Arrich J., Fleischhackl S., Losert H., Uray T., Koehler K., Sterz F., Mittlboeck M., Hoerauf K.
Anesth Analg. 2006;103 : 1485-1488.

Electromagnetic fields (EMF) reduce the signal quality of electrocardiograms and may lead to the misinterpretation by automated external defibrillators (AED). The authors designed this investigation as a prospective study, with a randomized sequence of AED applications on healthy volunteers. they chose busy public places where public access defibrillation was possible as test locations. Strong EMF were sought and found at train stations next to accelerating and decelerating trains. The primary outcome variable was the absolute number of shocks advised in the presence of sinus rhythm by five commonly used AED in Austria. For data analysis, the statistician was blinded in regard to the AED models tested. Data analysis was based on a per protocol evaluation. Of 390 tests run, 0 cases of false positive results occurred (95% CI: 0-0.77). AED can be regarded as safe, even with the interference of EMF present at train stations.

2. Occupational exposure

NO ASSOCIATION BETWEEN OCCUPATIONAL EXPOSURE TO ELF MAGNETIC FIELD AND URINARY 6-SULFATOXIMELATONIN IN WORKERS.

Gobba F., Bravo G., Scaringi M., Roccatto L.
Bioelectromagnetics 2006; 27 : 667-673.

A suppression in melatonin secretion is one of the mechanisms proposed to explain the possible adverse effects of extremely low frequency magnetic fields (ELF-MF), but the results of research are inconclusive. This study investigated the effect of occupational ELF-MF exposure on 6-sulfatoximelatonin (6-OHMS). Exposure was monitored for three complete work shifts in 59 workers using personal exposure meters. Environmental exposure was also evaluated. Urinary 6-OHMS in morning samples, an indicator of night-time melatonin production, was measured. Urine was collected twice on Friday and the following Monday. Workers were classified according to ELF exposure as low exposed (≤ 0.2 microT) or higher exposed (>0.2 microT): 6-OHMS did not differ between groups ($P > .05$) in either Friday or Monday

urine samples. In addition, 6-OHMS was not related to exposure under multivariate analysis. The ratio between 6-OHMS in Monday versus Friday samples was also calculated to test the hypothesis of a possible variation in pineal function after 2 days, interruption of occupational ELF-MF exposure: again no exposure-related difference was observed. These results do not support the hypothesis that occupational exposure to ELF-MF significantly influences melatonin secretion.