

EMFs

IARC monographs series

An expert scientific working group of the Monographs Programme of the International Agency for Research on Cancer (IARC) has concluded its review of health effects of static and extremely low frequency (ELF) electric and magnetic fields (50 to 60 Hz).

IARC has now concluded that ELF magnetic fields are possibly carcinogenic to humans, based on consistent statistical associations of high level residential magnetic fields with a doubling of risk of childhood leukaemia. Children who are exposed to residential ELF magnetic fields less than 0.4 microTesla have no increased risk for leukaemia. Because of insufficient data, static magnetic fields and static and extremely low frequency electric fields could not be classified as to carcinogenic risk to humans.

Pooled analyses of data from a number of well-conducted studies show a fairly consistent statistical association between a doubling of risk of childhood leukaemia and power-frequency (50 or 60 Hz) residential ELF magnetic field strengths above 0.4 microTesla. In contrast, no consistent evidence was found that childhood exposures to ELF electric or magnetic fields are associated with brain tumours or any other kinds of solid tumours. No consistent evidence was found that residential or occupational exposures of adults to ELF magnetic fields increase risk for any kind of cancer.

Studies in experimental animals have not shown a consistent carcinogenic or co-carcinogenic effects of exposures to ELF magnetic fields, and no scientific explanation has been established for the observed association of increased childhood leukaemia risk with increasing residential ELF magnetic field exposure.

Comment

UK survey work suggests the number of children exposed above this threshold is very small. The number of emf-associated cases of childhood leukaemia should be around 1 per year in the UK.

Causation was not clarified by this IARC report. It is still possible that a confounding factor, not properly allowed for in studies so far, could account for the observed association. Socio economic status is known to be associated with leukaemia risk, and was allowed for by some means or another in the well-conducted studies referred to above.

IARC classifications of carcinogens are usually based on a more precautionary approach to safety standards than those that would apply to civil law. Even so, the classification suggested by the phrase "possibly carcinogenic to humans", is the lowest available, while still suggesting some potential risk.

The risk threshold of 0.4 microTesla is derived from a few well-conducted studies and refers to time weighted average exposure. Why this measure of exposure should be applied is not clear or based on a biological model, except that it is computationally convenient.

There is general agreement that further studies would have to an order of magnitude larger than the sum of previous studies if this threshold is to be significantly challenged. Studies to clarify causation would also have to be of this size, but as yet, genetic and other environmental factors required for such a study are merely speculative. Until some further guidance comes from biology, it is our view that such large-scale research projects will be considered unjustified.