

## Research on Prenatal, Childhood and Occupational Exposure to Magnetic Fields



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No. 01

### **Editorial**

During the process of compiling this issue of the Situation Report Bulletin, I took part in the annual joint meeting of the Bioelectromagnetics Society (BEMS) and the European Bioelectromagnetics Association (EBEA). The BioEM2019 conference, held June 23–28 in Montpellier, France, presented a wide range of interesting studies on electric and magnetic fields. This time, as I was involved in the advance review of abstracts submitted for the conference, I took an even closer look at them. I also agreed to review some of the student presentations, the best of which are awarded each time. More information can be found on the conference website.

According to the website of ICNIRP, the International Commission on Non-Ionizing Radiation, the Commission is holding its 9th workshop on non-ionizing radiation in South Korea in May next year. The ICNIRP website also reports on the death of Professor Kari Jokela, a long-standing staff member of the Finnish Radiation and Nuclear Safety Authority and a member of the ICNIRP expert group. He was a significant contributor to the field in Finland, and I readily agree with what



ICNIRP has written in memoriam: "We will remember and miss Kari as a very skilled, dedicated, extremely pleasant and whole-hearted fellow and colleague."

Once again, I have found new scientific publications of interest for this bulletin. The bulletin starts with papers on the possible association between power lines and childhood leukemia. One of the studies investigates whether there have been changes over time in the reported risk of childhood leukemia associated with magnetic fields, while another focuses on the association of parental occupational exposures and the risk of childhood acute leukemia.

The other topics covered in this bulletin include, for example, the impact of extremely low-frequency magnetic fields on human postural control, as tested on volunteer human subjects. Occupational exposures are discussed in two more papers, with the first one dealing with the effect of chronic exposure to extremely low-frequency electromagnetic fields on sleep quality, stress, depression, and anxiety. The second one reports on a pooled study, with data from three different countries, exploring the associations of occupational exposure to extremely low-frequency magnetic fields and electric shocks with the risk of amyotrophic lateral sclerosis (ALS).

Hope you enjoy reading this summary in English!

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No. 02

### ***Childhood Leukemia Risk in the California Power Line Study: Magnetic Fields Versus Distance from Power Lines***

Editor-in-chief's comment: Based on data from a Californian records-based case-control study, the researchers examined, using statistical models, the relationships between magnetic fields, distance from power lines, and childhood leukemia risk. They concluded that their findings argue against magnetic fields as a sole explanation for the association between distance from power lines and childhood leukemia and in favor of some other explanation linked to power lines.

Source:

Crespi C M, Swanson J, Vergara X P, Kheifets L. Childhood leukemia risk in the California Power Line Study: Magnetic fields versus distance from power lines. *Environmental Research* 171 (2019) 530–535.

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No. 03

### ***Parental Occupational Exposures and Risk of Childhood Acute Leukemia***

Editor-in-chief's comment: The researchers aimed to assess the association between parental occupational exposures to social contacts, chemicals and electromagnetic fields and the risk of offspring acute leukemia. Included in the study were 108 children with acute lymphoblastic or myeloid leukemia. A questionnaire was used to collect parental information. High birth weight and family history of cancer were associated with the development of childhood acute leukemia.

Source:

Kyriakopoulou A, Meimeti E, Moisoglou I, Psarrou A, Provatopoulou X, Dounias G. Parental Occupational Exposures and Risk of Childhood Acute Leukemia. *Mater Sociomed.* 2018, 30(3): 209–214.

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No. 04

### ***Changes over Time in the Reported Risk for Childhood Leukemia and Magnetic Fields***

Editor-in-chief's comment: The authors investigated changes over time in the reported risk of childhood leukemia associated with magnetic fields. They compared the risks reported in 41 earlier studies, using inverse-variance weighting, and drew risk estimates from previous pooled analyses. Their conclusion was that the cumulative relative risk has declined over time but not statistically significantly.

Source:

Swanson J, Kheifets L, Vergara X. Changes over time in the reported risk for childhood leukaemia and magnetic fields. *Journal of Radiological Protection* 39 (2019) 470–488.

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No. 05

### ***Prenatal Exposure to Extremely Low-Frequency Magnetic Field and Its Impact on Fetal Growth***

Editor-in-chief's comment: The authors examined the association between maternal exposure to extremely low-frequency magnetic fields during pregnancy and fetal growth in Shanghai. A total of 128 pregnant women in their third trimester were recruited for daily measurements of their exposure to magnetic fields. Fetal growth was measured within 24 h after birth by, for example, birth weight. Based on the results, the authors concluded that prenatal exposure to higher ELF-MF levels was associated with decreased fetal growth in girls, but not in boys.

Source:

Ren Y, Chen J, Miao M, Li D-K, Liang H, Wang Z, Yang F, Sun X, Yuan W. Prenatal exposure to extremely low frequency magnetic field and its impact on fetal growth. *Environmental Health* (2019) 18:6.

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No. 06

### ***Exposure and Health Risk Perception of Extremely Low-Frequency and Radiofrequency Electromagnetic Fields and the Effect of Providing Information***

Editor-in-chief's comment: The researchers assessed perceptions of magnetic field exposure and health risks as well as possible determinants that explain such perceptions. A total of 387 mothers completed a questionnaire on perceived exposure and perceived health risks of exposure. Later, MF measurements were conducted in their homes. After having been informed that the levels were below the EU recommendation, the participants completed the questionnaire a second time. According to the authors, providing information did not alter health-risk perceptions but did decrease overall exposure perception.

Source:

Gallastegi M, Jiménez-Zabala A, Molinuevo A, Aurrekoetxea J J, Santa-Marina L, Vozmediano L, Ibarluzea J. Exposure and health risks perception of extremely low frequency and radiofrequency electromagnetic fields and the effect of providing information. *Environmental Research* 169 (2019) 501–509.

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No. 07

### ***Impact of Extremely Low-Frequency Magnetic Fields on Human Postural Control***

Editor-in-chief's comment: The aim of this study was to explore the effects of a time-varying magnetic-field exposure on human postural control. The 22 participants in the study were also subjected to electric stimulations. The center of pressure displacement was collected to investigate postural modulation in the participants. According to the research group, time-varying stimulations failed to show any significant effect in comparison to sham exposure.

Source:

Villard S, Allen A, Bouisset N, Corbacio M, Thomas A, Guerraz M, Legros A. Impact of extremely low-frequency magnetic fields on human postural control. *Experimental Brain Research* (2019) 237:611–623.

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No. 08

### ***The Effect of Chronic Exposure to Extremely Low-Frequency Electromagnetic Fields on Sleep Quality, Stress, Depression and Anxiety***

Editor-in-chief's comment: The authors investigated the effect of chronic exposure to extremely low-frequency electromagnetic fields on sleep quality, stress, depression and anxiety among power plant workers. Included in the study were 132 workers as the exposed group and 143 other workers as the unexposed group. The intensity of ELF-EMF at work stations was measured, and then the time-weighted average was calculated. According to the authors, the results suggest that long-term occupational exposure to ELF-EMF may lead to depression, stress, anxiety, and poor sleep quality.

Source:

Bagheri Hosseinabadi M, Khanjani N, Hossein Ebrahimi M, Haji B, Abdolahfard M. The effect of chronic exposure to extremely low-frequency electromagnetic fields on sleep quality, stress, depression and anxiety. *Electromagnetic Biology and Medicine* 2019, 38:1, 96–101.

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No. 09

### ***Associations of Electric Shock and Extremely Low-Frequency Magnetic Field Exposure with the Risk of Amyotrophic Lateral Sclerosis***

Editor-in-chief's comment: The research group explored the associations of occupational exposure to magnetic fields and electric shocks with the risk of ALS in a pooled study of data from three different countries.

Source:

Peters S, Visser A E, D'Ovidio F, Beghi E, Chiò A, Logroscino G, Hardiman O, Kromhout H, Huss A, Veldink J, Vermeulen R, van den Berg L H. Associations of Electric Shock and Extremely Low-Frequency Magnetic Field Exposure With the Risk of Amyotrophic Lateral Sclerosis. *American Journal of Epidemiology* 2019;188(4):796–805.

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