

Despite the Covid-19 pandemic, quite a few studies related to electric and magnetic fields have been published



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No. 01

Editorial

In the previous bulletin, I mentioned that the BioEM2021 conference would be held in June 2021 in Hawaii. Due to the Covid-19 pandemic, the situation has changed. According to the organizers (the European BioElectromagnetics Association and Bioelectromagnetics Society), the BioEM2021 conference will be held online, and possibly also in a new location in Europe, June 13–18, 2021. The current plan is for BioEM2022 to take place June 19–24, 2022, in Nagoya, Japan.

The ICNIRP website advises that they have canceled the 9th International NIR Workshop in South Korea that was scheduled for January 2021. According to the website announcement, their aim is to continue meetings as a scientific community in the future, either on virtual platforms or on-site as



well, in the long run. They advise you to stay tuned for any updates by subscribing to the ICNIRP newsletter.

Despite the Covid-19 pandemic, quite a few studies related to electric and magnetic fields have still been published. The first article in this bulletin is a publication that explores the risk of childhood leukemia and socioeconomic factors in Denmark. The article doesn't deal with electric and magnetic fields directly, but I think it provides useful background information on the theme. The second article continues with the same theme. It examines the risk of acute lymphoblastic leukemia in Mexico City.

This time, the bulletin includes several articles on neurodegenerative diseases, such as ALS (amyotrophic lateral sclerosis). The topic has been approached through a literature review and a meta-analysis. The studies have also included exposure to electric shocks.

These bulletins have traditionally focused more on public exposure rather than occupational exposure. This time, however, I found a number of interesting articles on occupational exposure, so I included more of them than usual. These articles discuss motor neuron diseases, among other things.

The article I found especially interesting described the short-term effect of occupational levels of a 50 Hz electromagnetic field on human heart rate variability. In my doctoral dissertation, I studied transmission-line workers' heart rates in field exposure. The topic still seems to attract researchers' interest.

I should also mention that we have decided to stop collecting people's e-mail addresses and sending the situation report bulletin as a newsletter. From now on, the new bulletin will be available at www.leenakorpinen.com. The bulletin is usually published twice a year: around Christmas and in June-July at the start of the summer holidays, and this tradition will continue.

Hope you enjoy reading this summary in English!

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No. 02

Editor-in-chief's comment: Conducting a nationwide register-based case-control study, the researchers evaluated the association of socioeconomic status with the risk of childhood leukemia. They observed that a medium or high level of parental education was associated with a higher risk of acute myeloid leukemia (AML) in the offspring when children were aged 0 to 4 years at the time of diagnosis. According to the researchers, further research might provide new clues for the potential etiology of leukemia.

Is the Risk of Childhood Leukaemia Associated with Socioeconomic Measures in Denmark? A Nationwide Register-Based Case-Control Study

Source:

Erdmann F, Hvidtfeldt U A, Feychting M, Sørensen M, Raaschou-Nielsen O. Is the risk of childhood leukaemia associated with socioeconomic measures in Denmark? A nationwide register-based case-control study. *International Journal of Cancer*. 2020; 1–14.

No. 03

Editor-in-chief's comment: The researchers considered it important to study the relationship between extremely low frequency magnetic fields (ELF-MFs) and childhood leukemia in a city with a high incidence of cancer in children and an elevated exposure to ELF-MF. Their study was conducted in Mexico City. Using logistic regression analysis, the researchers examined exposure to magnetic fields as a continuous variable (per 0.2 μ T intervals) and associated it with a moderate risk of B-lineage acute lymphoblastic leukemia.

Extremely Low-Frequency Magnetic Fields and the Risk of Childhood B-Lineage Acute Lymphoblastic Leukemia in a City with High Incidence of Leukemia and Elevated Exposure to ELF Magnetic Fields

Source:

Núñez-Enríquez J C, Correa-Correa V, Flores-Lujano J, Pérez-Saldivar M L, Jiménez-Hernández E, Martín-Trejo J A, Espinoza-Hernández L E, Medina-Sanson A, Cárdenas-Cardos R, Flores-Villegas L V, Peñaloza-González J G, Torres-Nava J R, Espinosa-Elizondo R M, Amador-Sánchez R, Rivera-Luna R, Dosta-Herrera J J, Mondragón-García J A, González-Ulibarri J E, Martínez-Silva S I, Espinoza-Anrubio G, Duarte-Rodríguez D A, García-Cortés L R, Gil-Hernández A E, Mejía-Arangur J M. Extremely low-frequency magnetic fields and the risk of childhood b-lineage acute lymphoblastic leukemia in a city with high incidence of leukemia and elevated exposure to elf magnetic fields. *Bioelectromagnetics*. 2020;41:581–597.



No. 04

Editor-in-chief's comment: The researchers examined the potential association of personal exposure to magnetic fields with pregnancy outcomes among a cohort of women from a fertility clinic. To study exposure, the women wore personal exposure monitors. The median of the overall daily mean exposure level was 0.11 μT (1.10 mG) and the maximum 1.554 μT (15.54 mG). According to the researchers, no associations were observed between magnetic field exposure and fertility treatment outcomes or pregnancy outcomes.

Association of Personal Exposure to Power-Frequency Magnetic Fields with Pregnancy Outcomes among Women Seeking Fertility Treatment in a Longitudinal Cohort Study

Source:

Ingle M E, Mínguez-Alarcón L, Lewis R C, Williams P L, Ford J B, Dadd R, Hauser R, Meeker J D. Association of personal exposure to power-frequency magnetic fields with pregnancy outcomes among women seeking fertility treatment in a longitudinal cohort study. *Fertil Steril* 2020;114:1058–66.

No. 05

Editor-in-chief's comment: The authors conducted a literature review of earlier studies that have examined the association between electromagnetic fields and neurodegenerative diseases. Increased technology generating electromagnetic fields has also led to more research into electromagnetic field exposure as a potential risk factor for neurodegeneration. The authors found that epidemiological studies of Alzheimer's disease, Parkinson's disease and ALS show discordant results, and no clear correlation between electromagnetic exposure and these diseases have been shown.

The Role of Magnetic Fields in Neurodegenerative Diseases

Source:

Riancho J, Sanchez de la Torre J R, Paz-Fajardo L, Limia C, Santurtun A, Cifra M, Kourtidis K, Fdez-Arroyabe P. The role of magnetic fields in neurodegenerative diseases. *International Journal of Biometeorology* 2020.



No. 06

Editor-in-chief's comment: The researchers have been designing an exposure protocol for a study of idiopathic environmental intolerance (IEI) attributed to electromagnetic fields (EMF). Their idea is that involving people with IEI-EMF in the development of the protocol might make it easier for them to accept the research method, while respecting technical constraints and scientific quality requirements. The article describes the protocol resulting from this collaborative process.

Co-Designed Exposure Protocol in the Study of Idiopathic Environmental Intolerance Attributed to Electromagnetic Fields

Source:

Ledent M, Vatoz B, Pirard W, Bordarie J, Prignot N, Oftedal G, Geuzaine C, Beauvois V, Bouland C, Verschaeve L, Dieudonné M. Co-designed exposure protocol in the study of idiopathic environmental intolerance attributed to electromagnetic fields. *Bioelectromagnetics*. 2020;41: 425–437.

No. 07

Editor-in-chief's comment: Using a systematic literature review and meta-analysis of earlier research results, the researchers explored whether occupational exposure to extremely low frequency magnetic fields (ELF-EMF) and/or electric shocks are a risk factor for ALS. They also analyzed publication bias. The studies were collected from PubMed, Embase, and Web of Science databases. The meta-analysis included 27 publications. The researchers' findings indicate that exposure to ELF-MF might be a risk factor for ALS, whereas exposure to electric shocks would not. They say, however, that the results should be interpreted with caution.

Amyotrophic Lateral Sclerosis, Occupational Exposure to Extremely Low Frequency Magnetic Fields and Electric Shocks: a Systematic Review and Meta-Analysis

Source:

Jalilian H, Najafi K, Khosravi Y, Rösli M. Amyotrophic lateral sclerosis, occupational exposure to extremely low frequency magnetic fields and electric shocks: a systematic review and meta-analysis. *Reviews on Environmental Health* 2020.



No. 08

Editor-in-chief's comment: The researchers explored the effect of exposure to occupational-level extremely low frequency electromagnetic fields on human heart rate and heart rate variability. The sample consisted of 34 healthy males aged 18–27 years. The participants were randomly assigned to the group exposed to the magnetic field and to the sham group. Both groups had 17 participants. According to the researchers, short-term exposure of the chest region to extremely low-frequency electromagnetic fields (28 μ T) may cause changes in the autonomic control of the cardiovascular system.

The Short-Term Effect of Occupational Levels of 50 Hz Electromagnetic Field on Human Heart Rate Variability

Source:

Binboğa E, Tok S, Munzuroğlu M. The short-term effect of occupational levels of 50 Hz electromagnetic field on human heart rate variability. *Bioelectromagnetics* 2020.

No 9

Editor-in-chief's comment: The writers have examined the association of occupational exposure to electric shocks and extremely low frequency electromagnetic fields with motor neuron disease. In line with earlier studies, the findings provide support for an association between occupational exposure to electric shocks and motor neuron disease.

Occupational Exposure to Electric Shocks and Extremely Low-Frequency Magnetic Fields and Motor Neurone Disease

Source:

Chen G X, 't Mannetje A, Douwes J, van den Berg L H, Pearce N, Kromhout H, Glass B, Brewer N, McLean D J. Occupational exposure to electric shocks and extremely low-frequency magnetic fields and motor neurone disease. *American Journal of Epidemiology* 2020.

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