Despite the Covid-19 Pandemic, Research Continues on the Health Issues Related to Extremely Low-Frequency Electric and Magnetic Fields

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No. 01

Editorial

In the previous bulletin, I mentioned that the BioEM2021 conference would be held online, and possibly also in a new location in Europe in June 2021. Due to the Covid-19 pandemic, the situation has changed once again. According to the organizers (the European BioElectromagnetics Association and Bioelectromagnetics Society), the BioEM2021 conference will be held September 26 – October 1, 2021, in Ghent, Belgium. The conference website advises that due to the Covid-19 pandemic, the 2021 conference will be organized using a hybrid model. The current plan is for the BioEM2022 to take place June 19–24, 2022, in Nagoya, Japan.

Despite the Covid-19 pandemic, quite a few studies related to electric and magnetic fields have still been published. Once again, I have found new scientific articles of interest for this bulletin. It seems

that exposure to electric fields has attracted more attention than before. For example, a study has been conducted on how you can reduce exposure to electric fields near power lines. Another study looked into human perception of electric fields, conducting the tests in laboratory conditions. An experimental study explored the impact of magnetic field exposure on selected biochemical parameters of human blood. A completely new topic to me personally was the pulsed magnetic fields related to robotic lawn mowers, as described in one of the articles.

This time, the bulletin includes three articles that discuss occupational health issues. In France, a cohort study is being conducted on retirees from the French Electricity Transmission Network (RTE, Réseau de Transport d'Electricité) who were occupationally exposed to 50 Hz magnetic fields. The article presents the protocol and the results of the first wave of inclusion. I'm really looking forward to hearing more results from this study.

The bulletin also includes an article on exposure to optical radiation and electromagnetic fields in the workplace, discussing the criteria for occupational health surveillance according to current European legislation. In connection with electromagnetic fields, there is a risk for employees who have active implanted medical devices, such as cardiac pacemakers.

Hope you enjoy reading this summary in English!

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No. 02
Editor-in-chief's comment: The researchers' objective was to find out if extremely low frequency magnetic fields are associated with adult hematological malignancies. They examined the exposure of people who had lived in buildings with indoor transformer stations. According to the researchers, their results only support association between acute lymphocytic leukemia and exposure to magnetic fields. For most of the hematological neoplasms, the results suggested decreased rather than increased risk.

A Cohort Study on Adult Hematological Malignancies and Brain Tumors in Relation to Magnetic Fields from Indoor Transformer Stations

Source:
Khan M W, Juutilainen J, Auvinen A, Naarala J, Pukkala E, Roivainen P. A cohort study on adult hematological malignancies and brain tumors in relation to magnetic fields from indoor transformer stations. International Journal of Hygiene and Environmental Health 2021; 233: 113712.

No. 03
Editor-in-chief's comment: Based on the measurements carried out, the researchers say it is not rare for the electric field strength in operating power lines in Europe to exceed the legally prescribed limit value for general public exposure. In the article, they present the dynamic line rating they have developed for power lines. They suggest this would increase the safety and security of power lines and ensure that the electric field's peak is within the boundaries of the legal limits all the time.

Dynamic Line Rating – An Effective Method to Increase the Safety of Power Lines

Source:
Rácz L; Németh B. Dynamic Line Rating – An effective method to increase the safety of power lines. Appl. Sci. 2021, 11, 492.

No. 04
Editor-in-chief's comment: The researchers investigated the impact of a 50 Hz magnetic field on selected biochemical parameters of human blood. They used a test environment in which 38 subjects were exposed to the magnetic field. Biochemical parameters were examined before and after the exposure. Based on the analyses conducted, the researchers concluded that the magnetic field exposure showed no significant effect in relation to any of the examined parameters.

Survey Identification of the Impact of a 50 Hz Magnetic Field on Selected Biochemical Parameters of Human Blood

Source:
Sztafrowski D, Jakubaszko J. Survey identification of impact the 50 Hz magnetic field on selected biochemical parameters of human blood. Journal of Physics: Conference Series 2021, 1782, 012038.

No. 05
Editor-in-chief's comment: The researchers examined the magnetic fields generated by robotic lawn mowers in domestic settings and the magnetic exposure related to them. The robot electronics sense a pulsed magnetic field generated by the electric boundary wires, and the researchers see this magnetic field as a new source for domestic magnetic field exposure. The researchers recommend avoiding unnecessary exposure to the magnetic fields generated by robotic mowers by, for example, turning off the system when children are playing on the lawn or a baby is sleeping in a stroller placed on the lawn.

Robotic Lawn Mower: A New Source for Domestic Magnetic Field Exposure

Source:
Hansson Mild K, Johnsson A, Hardell L. Robotic lawn mower: A new source for domestic magnetic field exposure. Bioelectromagnetics 2021, 42: 95–99.

No. 06
Editor-in-chief's comment: The researchers' aim was to identify environmental and experimental factors influencing the human perception of DC and AC electric fields and the co-exposure of them (hybrid electric field) under whole-body exposure. The study was conducted in an exposure laboratory with 11 participants. The researchers found several environmental and experimental factors that influenced the subjects' perception of electric fields. The results provide a basis for further research.

Identification of Environmental and Experimental Factors Influencing Human Perception of DC and AC Electric Fields

Source:
Jankowiak K, Driessen S, Kaifie A, Kimpeler S, Krampert T, Kraus T, Stunder D, Kursawe M. Identification of environmental and experimental factors influencing human perception of DC and AC electric fields. Bioelectromagnetics 2021.

No. 07
Editor-in-chief's comment: The researchers follow up the cohort of retirees from the French Electricity Transmission Network (RTE, Réseau de Transport d'Electricité) who were occupationally exposed to 50 Hz magnetic fields. The diseases selected for follow-up are cancers, ischemic heart diseases, and neurodegenerative diseases. The subjects' average retirement age was 55 years, so the researchers think the cohort is still young and it is too early to draw conclusions on the association between magnetic field exposure and the development of the diseases.

Cohort of Retirees from the French Electricity Transmission Network (RTE: Réseau de Transport d'Electricité) Occupationally Exposed to 50 Hz Magnetic Fields. A Protocol and Results of the First Wave of Inclusion

Source:
Souques M, Duburcq A, Bureau I, Courouve L, Babin C, Magne I, Cabanes P-A. Cohort of retirees from the French Electricity Transmission Network (RTE: Réseau de Transport d'Electricité) occupationally exposed to 50 Hz magnetic fields. A protocol and results of the first wave of inclusion. Environnement, Risques & Santé 2021 20(1):22–34.

No. 08
Editor-in-chief's comment: The writers discuss the main health surveillance criteria for people exposed to optical radiation and electromagnetic fields in the workplace. For low frequency magnetic fields, workers at particular risk are those with implanted active medical devices, such as cardioverter defibrillators or pacemakers.

Exposure to Optical Radiation and Electromagnetic Fields at the Workplace: Criteria for Occupational Health Surveillance According to Current European Legislation

Source:
Modenese A, Gobba F. Exposure to optical radiation and electromagnetic fields at the workplace: criteria for occupational health surveillance according to current European legislation. Advances in Science, Technology and Engineering Systems Journal 2021 Vol. 6, No. 2.

No 9
Editor-in-chief's comment: The researchers are looking into the association between ALS and occupational exposure to magnetic fields. They assessed the feasibility of conducting a pooled analysis using the original data from earlier studies. They sent a survey to the principal investigators of previous studies.

Occupational Exposure to Extremely Low-Frequency Magnetic Fields and Risk of Amyotrophic Lateral Sclerosis: Results of a Feasibility Study for a Pooled Analysis of Original Data

Source:
Baaken D, Dechent D, Blettner M, Drießen S, Merzenich H. Occupational exposure to extremely low-frequency magnetic fields and risk of amyotrophic lateral sclerosis: Results of a feasibility study for a pooled analysis of original data. Bioelectromagnetics 2021;42:271–283.

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