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Occupational Exposure to Extremely Low Frequency Magnetic Fields and Cancer Incidence Risk in a Large Prospective Cohort Study

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Background
This study investigated the association between occupational exposure to extremely low frequency magnetic fields (ELF-MF) and selected types of cancer within the prospective Netherlands Cohort Study (NLCS).

Methods
For this case-cohort analysis, 120,852 men and women aged 55 to 69 years at time of enrollment in 1986 were followed up (17.3 years) for incident cases of lung (2,718 cases), breast (2,076 cases), brain (244 cases) and hematopoietic (1,436 cases) cancers. Information on occupational history and potential confounders was collected at baseline through a self- administered questionnaire. Occupations were coded using the International Standard Classification of Occupations (ISCO-88). Occupational ELF-MF exposure was assigned through a semi-quantitative ELF-MF job-exposure matrix (background, low and high exposure). Metrics used in the epidemiological analyses of ELF-MF exposure were ever low and ever high exposed versus background exposure and cumulative exposure up to baseline. Associations with cancer incidence were analyzed with Cox-regression. Person-years were estimated from a subcohort of 5,000 subjects.

Results
Ever exposed and cumulative exposure to ELF-MF showed no effect on cancer incidence of lung, breast or brain cancer. Ever high exposed to ELF-MF showed a significant association with acute myeloid leukemia (AML) (hazard ratio [HR] 2.09; 95% confidence interval [CI] 1.05 – 4.15) and follicular lymphoma (HR 2.40; 95%CI 1.00 – 5.77). In addition, cumulative exposure to ELF-MF showed a positive association with follicular lymphoma.

Conclusions
In this cohort study, we found indications of an increased risk of AML and follicular lymphoma for subjects with increased ELF-MF exposure, but not with other types of cancer.

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